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Preface

International Congress on Health Sciences and Medical Technologies 2024: ICHSMT'24 is the 8th edition following several editions held online in 2021, and 2023 adding to in-person: Tlemcen, Algeria (2016, 2017, 2019 and 2022) and Algiers Algeria (2018). It is an annual congress containing several conferences and workshops focusing on Medical technologies and health sciences.
The congress attracted researchers from several nations and specialties as: Algeria, Germany, Iran, Switzerland, Netherland, Denmark, Malaysia, Pakistan, France, Tunisia, Morocco, Brazil, Egypt, India, Iraq, and Benin. The congress author's affiliations were from several departments such as medicine, biology, physics and chemical sciences, computer sciences, veterinary, agronomy, environment, pharmacy, dental Medicine, electronic and mechanical engineering, and mathematics.
The content was selected via strong criteria applied by the members of the program committee. We received 127 submissions, which were reviewed by 1-5 reviewers and scanned by iThenticate software. We have accepted 91 abstracts presented in this book, the rate of acceptance was 71.75%. The submissions were categorized in five conferences:

- **ICMT'24: International Conference on Medical Technologies 2024**
- **ICCPH'24: International Conference on Cancer and Public Health 2024**
- **ICPCBS'24: International Conference on Preclinical and Basic Sciences 2024**
- **ICGI'24: International Conference on Genetic Items 2024**
- **ICEEP: International Conference on Education Ethics and Publishing 2024**

We are so proud to acknowledge all contributors to the establishment of this congress.

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ICMT'24 International Conference on Medical Technologies 2024

Dentistry and Medical Technologies: Equimolar Mixture of Oxygen and Nitrous Oxide as a Means of Conscious Sedation

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Introduction: Dental treatments can provoke fear or anxiety in adults, children, and people with disabilities, often leading to difficult behaviors during treatment. However, with advances in medical technology, inhalation sedation using an equimolar mixture of oxygen and nitrous oxide has proven to be a promising innovation. This method induces conscious sedation, promoting relaxation while allowing verbal communication between the practitioner and the patient. The objective of this presentation is to demonstrate, through a systematic review, the benefits of the innovative MEOPA inhalation sedation technology in dentistry for managing challenging patients.

Materials and Methods: The study is a systematic literature review following the PRISMA guidelines (Proposed Reporting Items for Systematic Reviews and Meta-Analyses). It includes scientific articles and publications from PubMed and Google Scholar databases, studying the advantages of conscious sedation for managing patients in dental medicine; publications are in English and French, spanning from 2004 to 2023. Keywords were combined and excluded to limit the number of retrieved articles.

Results: Initially, 32 articles were identified, reduced to 31 after excluding duplicates. After reviewing titles and abstracts, 15 articles were excluded, and 3 were eliminated as inaccessible, leaving 13 articles. Finally, 9 were selected after a full reading, with 4 excluded.

Conclusion: MEOPA is a key innovation in dentistry, offering conscious sedation that enhances the experience of challenging patients. By promoting relaxation without loss of consciousness, it optimizes therapeutic outcomes and reduces involuntary movements. Its rapid reversibility and high safety level also ensure patient well-being. In sum, MEOPA transforms dental care into a more serene and effective experience.

Keywords: Analgesia, Dentistry, Innovation, Equimolar Mixture of Oxygen and Nitrous Oxide (MEOPA), Conscious Sedation, Dental Care, Medical Technology

Detecting Lesion on Dermoscopic Images using YOLO Algorithms

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Abstract:

Background: Nowadays, skin cancer is a major problem human beings are facing which claims the greatest number of lives each year. Moreover, skin cancer occurs when errors occur in the DNA of skin cells, it begins at the top of the skin. Melanoma is the most dangerous skin form of skin cancer when compared to the other types. According to the Skin Cancer Foundation, there will be a 7.3% increase in newly diagnosed cases of melanoma in the world in 2024, along with a 3.8% increase in melanoma-related deaths.

Methods: To begin, we propose a deep learning approach to detect, and predict the lesion based on historical clinical image data using the YOLO v9 and YOLO v8 algorithms. Therefore, YOLOv9 was utilized to detect the region of interest (ROI) in two publicly available datasets HAM 10000 and PH2.

Results: In our study, the results demonstrate visually how well our YOLO v9 and YOLO v8 segmentation models for skin lesion object detection performs. Through the use of graphs, photos and visualizations, we aim to provide qualitative perspectives about the accuracy and effectiveness of our proposed approach. To summarize, YOLOv8 is now outperforming YOLOv9 in terms of precision and recall measures, even though YOLOv9 brings significant architectural innovations targeted at increasing accuracy and efficiency. The decision between the two models should be based on the particular needs of the application, taking into account the requirements for accuracy, speed, and computing economy.

Conclusion: Many disorders connected to the skin can only be diagnosed with the use of image analysis. Early detection of a skin lesion and the results of the initial smears can result in an instant diagnosis and the start of therapy. Deep learning techniques are utilized in the recommended strategy to identify regions of interest (YOLO v8 and YOLO v9). We provide object detection techniques for photos of skin lesions in this paper. The research community has recently focused a great deal of time and attention on the subject of segmentation algorithms. This has led to the development of several approaches to tackle the deep learning issue.

Keywords: Dermoscopic Image, Skin Cancer, Skin Lesion, Deep Learning, Object Detection, YOLO.

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Stability Study of Glycemic Self-Monitoring Strips Under Variant Conditions of Temperature, Humidity, Time and Target Concentration: Integration of a Neural Network Model

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Abstract:

According to the International Diabetes Federation, the number of diabetics is constantly increasing and is expected to reach 700 million by 2045 if current trends continue.

Thus, monitoring blood glucose levels is crucial for early diagnosis of diabetes or for monitoring patients with this disease. it is imperative to establish clear recommendations for the storage of blood glucose strips to ensure their reliability and accuracy of blood glucose measurements. The study aimed to develop a predictive model for the stability of glucose strips using neural network model.

Methods: the glucose strips were manufactured using the double film process, the stability study was performed on 332 strips bottles in various temperature and humidity conditions (de 4±2°C and 90±10% of humidity, 4±2°C and 10±10% of humidity, 22±3°C and 40±10% of humidity, 31±2°C and 10±10% of humidity, 31±2°C and 90±10% of humidity), strips quality control was performed using an YSI automate, and Matlab software was used to perform the Neural Network Modeling.

Results: the model with 17 neurons in the hidden layer was chosen (R^2=0.99), displaying a mean square error of 0.0078, confirming a superior accuracy compared to other configurations. The input variables (time, target concentration, temperature, humidity) contribute equally to the blood sugar values (respectively: 24.5%, 28.4%, 24.8% and 22.3%). However, the target concentration and temperature were the factors which most influences the measurement of blood sugar thus the stability of glucose strips.

Conclusion: Neuronal network is an artificial intelligence tool that helped to understand the influence of various stockage and control factors on the quality and stability of glucose strips.

Keywords: Stability study, Neural Network, Diabetes, Glucose strips, Humidity and Temperature.

Assessing User Acceptance of Intel ACAT Integration in Smart Home Environments for Individuals with Disabilities

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Abstract:

Background: The integration of assistive technologies, such as Intel's Assistive Context-Aware Toolkit (ACAT), with smart home systems presents significant opportunities to enhance the independence of individuals with disabilities [1,2]. However, understanding user acceptance of such technologies is crucial for their successful implementation and adoption. This study aims to assess the user acceptance of Intel ACAT in smart home environments among individuals with disabilities, drawing upon the technology acceptance model as a theoretical framework.

Methods: A mixed-methods approach was employed, involving both quantitative and qualitative data collection. A survey was administered to a sample of individuals with disabilities who have experience using smart home technologies and assistive devices. The survey evaluated perceived ease of use, perceived usefulness, and overall user satisfaction with the Intel ACAT integration. Additionally, semi-structured interviews were conducted to gather in-depth insights into users' experiences and attitudes towards the integration.

Results: Preliminary findings indicate a positive perception of Intel ACAT's usability and functionality among users. Quantitative analysis revealed that perceived ease of use significantly influenced perceived usefulness, which in turn affected overall user satisfaction. Qualitative data highlighted specific features that users found particularly beneficial, such as customizable input methods and seamless integration with existing smart home devices. Users expressed a strong desire for further improvements in accessibility features and user support.

Conclusion: The integration of Intel ACAT with smart home environments is viewed favorably by individuals with disabilities, indicating a promising pathway for enhancing their independence and quality of life. However, to optimize user acceptance and satisfaction, ongoing improvements in usability and accessibility are essential. This study provides valuable insights for future research and practical recommendations for the implementation of assistive technologies in smart home settings.

Keywords: Intel ACAT, Assistive Technology, Smart Home, Individuals with Disabilities, Usability

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A Two-Stage Deep Learning Approach for Predicting Center-Involved Diabetic Macular Edema Using Ultra-Wide Field Color Fundus Photography

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Abstract:

Background: Center-involved diabetic macular edema (ci-DME) poses a significant threat to vision among diabetic patients, affecting millions globally. Early detection is vital to prevent irreversible vision loss. Traditional diagnostic methods, such as optical coherence tomography (OCT), can be resource-intensive and geographically limited. Ultra-Wide Field Color Fundus Photography (UWF-CFP) offers a non-invasive alternative, enabling broader retinal views for early detection of diabetic retinopathy (DR) and its complications. However, predicting ci-DME from UWF-CFP images is challenging due to variations in image quality across devices like Optos, Clarus, and Eidon. This study develops a deep learning model capable of predicting ci-DME onset within a year, utilizing UWF-CFP images without direct access to training data.

Methods: We propose a two-stage predictive modeling approach for the onset prediction of clinically significant Diabetic Macular Edema (ci-DME) using Ultra-Wide Field Color Fundus Photography (UWF-CFP) images. This approach leverages thousands of annotated UWF-CFP images collected from 14 French hospitals as part of the EVIRET project. The first stage involves a device detection model to classify the imaging device used to capture the fundus image. Based on the predicted device type, the system then applies one of two specialized ci-DME classification models (emc_optos or emc_clarus) in the second stage. Both models utilize the tf_efficientnetv2_xl architecture as their backbone [1].

To enhance model performance, we employ several techniques, including data augmentation, pretrained weights, and dynamic model switching. The models are evaluated using multiple metrics, such as AUC, F1 score, and calibration error (ECE). This approach aims to address the challenges of working with limited datasets and the variability in image characteristics between different UWF-CFP devices, ultimately providing a robust and accurate tool for early ci-DME detection.

Results: The proposed model achieved an AUC score of 0.98 on a simulated validation set, indicating strong performance in ci-DME prediction. However, the F1 score and calibration error suggested that the model struggled with class imbalance and calibration issues. These results highlighted the need for further improvements in handling imbalanced datasets and ensuring accurate probability estimates for clinical decision-making.

Conclusion: In conclusion, this study presents a promising two-stage deep learning approach for predicting ci-DME onset using UWF-CFP images across multiple devices. While the model shows strong performance with a high AUC score, further work is needed to address class imbalance and calibration issues. This research represents a significant step towards device-agnostic AI solutions for early ci-DME detection, potentially improving diabetic retinopathy management in clinical settings

Keywords: Diabetic Macular Edema, Deep Learning, UWF-CFP, Device Detection, Predictive Modeling, Image Processing.

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Design and optimization of diclofenac-loaded solid lipid particle: comparing the rotor-stator method with the combined rotor-stator-ultrasound method

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Abstract

Background:

Solid lipid particles, composed of biodegradable and biocompatible lipids, are gaining attention for their ability to enhance the penetration of active compounds in topical applications. This study explores using solid lipid particles to encapsulate diclofenac sodium (DS) for topical delivery, aiming to improve its therapeutic efficacy. By enhancing transdermal penetration, the approach targets localized or systemic effects, reducing gastrointestinal side effects associated with oral administration and improving patient outcomes.

Methods:

This research optimized formulations and conditions for solid lipid particles containing sodium diclofenac, comparing rotor-stator and ultrasound-rotor-stator technologies. Using Response Surface Methodology (RSM), the study analyzed variables like surfactant concentration, homogenization velocity, and duration to identify the most effective particle characteristics for enhanced performance.

Results:

Optical analyses confirmed the successful creation of stable dispersions, with encapsulation efficiencies ranging from 81% to 93% for rotor-stator formulations and 84% to 93% for the rotor-stator-ultrasound method. Particle sizes for diclofenac-loaded solid lipid particles ranged from 20 µm to 458 µm with the rotor-stator method, while the ultrasound-enhanced process produced smaller particles, ranging from 25 µm to 328 µm. Ultrasound incorporation notably reduced droplet size and improved encapsulation efficiency. Furthermore, Response Surface Methodology (RSM) highlighted the impact of key formulation factors on particle characteristics, demonstrating the importance of method and conditions in optimizing drug delivery for improved therapeutic outcomes.

Conclusion:

This study shows solid lipid particles effectively encapsulate diclofenac sodium, improving efficiency and particle size for enhanced transdermal delivery.

Keywords: Solid lipid particles**,** Response Surface Methodology (RSM), homogenization method, encapsulation efficiency, Particle size.

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Study of the crystallization of drug in a single well system

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Abstract:

Background: Polymorphism represents more than 80% of pharmaceutical molecules.

It represents the ability to exist in at least two distinct crystalline forms and has consequences in terms of solubility, availability and galenic formulation processes.

Methods: This work is based on the study of crystallization by cooling of drug in a single-well system in a few milliliters of solvent developed within the laboratory.

This system made it possible to follow the appearance of the first crystal as well as the growth. Hence the determination of the nucleation temperature as well as the size of the crystals.

Results: the effect of different parameters was studied, namely supersaturation, polarity of solvents.

The crystals obtained analysis with X-ray diffraction and scanning electron microscopy showed different polymorphic forms with different crystal sizes.

Conclusion: Multi-well technology made it possible to carry out a crystallization study in a small volume

Keywords: drug, crystal, single well technology, XRD, SEM

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Sliding mode with Adaptive model reference Controllers for glucose regulation

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Abstract

Background: Diabetes is a chronic metabolic illness in which body's blood glucose regulatory system is with mal function appropriately. Generally, the patients with Type 1 diabetes (T1D) patient involve strict blood glucose control for the reason that they have a deficiency of insulin production. For this purpose an artificial pancreas is a closed-loop system used for maintaining normoglycemia**.** This research work considers the closed loop control algorithm based on the model reference adaptive control (CGT) applied for the glucose concentration in (T1D) subject. The Bergman model is presented for studying dynamical behavior of the glucose. In order to show the performance of the proposed design, it is compared to the super twisting sliding mode control (STSMC) performed during most recent searches. A comparative analysis of the adaptive CGT and STSMC is given in results section. The results in silico of numerical simulation are provided to show the advantages of the proposed controllers.

Methods: This section is organized as follows: we provide a brief overview of Bergman's body mathematical model, then the adaptive reference model control design procedure and problem formulation are presented. Afterward the second proposed super twisting sliding mode controller is described. The two controllers applied on the subsystems glycemia/insulinemia in presence of uncertainty and external disturbance.

Results: Within the simulation, the response of glucose-insulin system output towards its reference. The results show clearly that the super twisting controller is faster than the CGT; in general, we are more interested to the performances of the system in steady state, where we note that the use of the super twisting control provides a better tracking than the CGT for the two cases, in absence and existence of both uncertainty and disturbance. The simulation results are presented to show the effectiveness of the proposed controllers for the Bergman's model.

Conclusion: In this work, Bergmann's model is discussed. Then two controllers: adaptive model reference and super twisting sliding mode controllers were developed to the glucose-insulin system. The blood glucose concentration of a type 1 diabetic patient is stabilized at the preferred level in the presence of the external disturbances. The robustness of the two controllers has been established during three different parameters in patients.

Keywords: Adaptive model reference control; Sliding mode control; Glucose regulation; Diabetes; Insulinemia; Glycemia.

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A BiLSTM-CRF Approach for Sequence Labeling in Medical Texts: An Application to Scintigraphy Report Analysis

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Abstract:

Background: Scintigraphy is a nuclear-based scanning method designed for detecting pathological human bone anomalies. Physicians usually apply this method to cancer-suffering patients in order to recognize bone metastasis by identifying secondary fixations. From this perspective, Incorporating Deep Learning (DL) and Natural Language Processing (NLP) in this medical domain becomes more than crucial, as these techniques enable faster, more accurate diagnoses while assisting nuclear medicine practitioners.

Methods: Since scintigraphy interpretations are stored in weakly structured reports, this work aims to develop a DL and NLP based system to automatically label body parts mentioned in these reports and accurately identify those associated with bone metastasis. Initially, we create our own dataset by manually annotating 540 de-identified scintigraphy reports written in French language, collected from the University Hospital Establishment of Oran. After the pre-processing task, 2645 of the 27446 total tokens are identified as body parts. Moreover, These organ tokens are manually categorized into two distinct classes: secondary fixation regions, comprising 1,832 tokens associated with bone metastasis, and non-secondary fixations, consisting of 813 tokens related to osteoarthritis, lesions, natural degenerations, extra-osseous fixations, and benignant tumors. Considering that the majority of body parts are defined by more than one token, we implement a BIO annotation format where the first token is tagged by B (Beginning) and I (Inside) for all subsequent tokens while the O (Outside) tag is reserved for tokens that do not correspond to any anatomical region. We combine the BiLSTM (Bidirectional Long Short Term Memory) model and the CRF (Conditional random field) decoder to perform sequence labeling. Since the region's neighborhood affects the interpretation, the Bi-LSTM component is chosen to capture the relation between body parts and their previous and next tokens. We add a CRF (Conditional random field) layer to ensure that the model produces valid label sequences by learning that the I-tagged classes should always preceded by a B-tagged category. Our model is trained on 80% of the dataset using the Adam optimizer with a learning rate of 0.01 and 10 epochs.

Results: The proposed BiLSTM-CRF model achieved a promising accuracy of 96% in the global recognition of named entities related to body parts, with a macro F1-Score of 88% indicating robust entity extraction capabilities. Likewise, the model yielded an encouraging result in classifying body parts fixations where the F1-Score reached 77% with an acceptable precision of 82% for bone metastasis detections and 77% for non-secondary fixations. When considering the sequencing of the identified body parts, the results are slightly lower, with a minimum precision of 77% for beginning classes and 68% for inside classes.

Conclusion: Body part identification and categorization in bone scintigraphy reports using NLP can be effective in medical text understanding, as evinced by our study that combines BiLSTM with CRF. Alongside bone scans, analyzing medical interpretations could improve the clinical decision-making of nuclear medicine professionals and contribute effectively to cancer-spreading detection.

Keywords: Artificial Intelligence, Deep Learning, Natural Language Processing, Classification, Nuclear Medicine, Sequence Labeling, Scintigraphy Reports, Medical Decision Making.

Development and In Vitro Study of a Nanosystem-Loaded Transdermal Patch

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Abstract:

Background: Many natural bioactive agents are effective both in vitro and in vivo for treating various diseases due to their versatile therapeutic effects, including antioxidant, anti-inflammatory, and anticancer properties. However, their use is often limited by restricted bioavailability, poor aqueous solubility, and low permeability, making it challenging to utilize these agents. To overcome these challenges, transdermal drug delivery systems, such as patches, can be employed to bypass the oral route and deliver bioactives through the skin, enhancing their therapeutic effects. Additionally, nanosized carriers are used to improve drug penetration and facilitate the loading of lipophilic active agents. This study aimed to develop nanocurcumin (NC) incorporated into transdermal patch for the prolonged delivery of curcumin.

Methods: A Franz cell was utilized to evaluate the diffusion of NC in the transdermal patch. The polymer-based patch was placed on the membrane, and samples were taken at regular intervals to quantify NC release using a UV-visible spectrophotometer. Analyses were also performed to determine pH and drug content. The results of the patch's sustained release were compared with those of a commercial patch.

Results: The patch conformed to pharmacopoeial standards, displaying a yellow, homogeneous, flexible, adhesive, and smooth surface with a pH of 6.61. Weight uniformity was 6.91 ± 0.0014 g, and drug content was 98.97 ± 0.013%, indicating homogeneous drug distribution. Transdermal delivery exhibited prolonged release over 24 hours, with significant improvement in nanocurcumin delivery compared to crude curcumin. The patch was designed to ensure controlled drug release. Furthermore, nanocurcumin retained its therapeutic activity (anti-inflammatory and antioxidant) at reduced concentrations, with only a slight loss compared to the pure form.

Conclusion: In vitro evaluation of the patch demonstrated a prolonged release of NC while preserving its antioxidant and anti-inflammatory properties. These results highlight the potential of this innovative transdermal system to enhance the therapeutic efficacy of curcumin.

Keywords: Nanocurcumin, Transdermal delivery, Patch, Cell franz.

Improvement in obtaining organs for people with reduced mobility

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Background: Medical technologies have a turnover that is constantly growing from one country to another. Some, necessary for the various joints functioning (shoulder, hips, knee...) damaged, are directed towards key products, such as prostheses. The control of manufacturing processes and their modeling now significantly improves the quality of these prostheses. However, the precision of the prototypes is an absolute priority for the complex geometries corresponding exactly to the reference data. The completed form quality and the computer-aided design and manufacturing (CAD / CAM) model of total knee prosthesis damaged joint didactic prototype. The goal is to generate a CNC code, for the considered form using different 3D Printers to ensure better performance of quality and productivity. Their implants realization knows a permanent evolution due to the Rapid prototyping new techniques. The proposed study is based on a first step on reverse engineering techniques to determine the articulation model. In a second step, the consumable (polymer) choice surfaces with different constraints (position, geometry...). The last step is for verification and results discussion.

Methods: The Object to be Build is modeled with the CAD model creation. Using a CAD software package or by using a laser scanner or a Coordinate Measuring Machine (CMM) (Reverse engineering). How to turn uncertainty into opportunity to someone needed help in their life. This operator tries, therefore, to manage this phenomenon by 3D Printer innovation. The Reverse engineering it‟s the Scan product then we compare the final product with the starting prototype.

Results: Our research showed that making, by 3D printing, the people with reduced mobility limbs prototypes had a positive impact. Our results also showed that this method will facilitate the movement as well as the need for these people. Demand and availability will be available in a very short time (characteristics of rapid prototyping).

Conclusion: This work presents an implementation set to develop or improve the prosthesis services. The goal is to ensure that prosthesis services are people-centered and responsive to the personal and environmental needs to ensure a healthy life and promote at all ages well-being. With these standards, any government can develop national policies, programs and plans for the highest quality prosthetic services. Then, the each person collaboration is not decreed, but is built on the common interest‟s merits and the desire to work together. All leads contribute to a positive development. An investigation combination will help everyone finding or developing something new.

Keywords: 3D Printer, Rapid prototyping technology, Computer-Aided Design (CAD) data, Consumable material (ABS), Reverse Engineering.

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Improvement to the Odontology Process Optimization « 3D printing case »

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Background: This paper presents a 3D printing techniques overview, as well as their implications from rapid prototyping technologies. However, 3D printing, known as additive manufacturing (AM), is a real convenience for economic growth and the manufacturing sectordevelopment. It has brought radical changes to manufacturing processes. It allows to produce with a material minimum, waste and time (Time is Money), complex custom parts. A bibliographic research was done to obtain an Odontology portrait product in hospitals by description 3D printing a constructing physical objects method from a CAD model. Our work was oriented towards the 3D printer and the consumable (bio-composites), fulfilling thenecessary conditions for a durable prosthesis.

Methods: Currently the most used method in dentistry; it allows the all metal prostheticelements production:

- Inlay-core, - Cast crowns, - Metal bridge,- Satellite frame,- CCM framework and CMBridge, - Implants, - PMF (EOS company) Coronary preparation (Source – Dental tribune) :

– The first point that must be emphasized beforehand is that the optical impression must bewell done. Indeed, the design quality depends on the scanning quality.

– The second important point is that the coronal preparation must also be well done. Indeed, the prepared natural tooth will receive the prosthesis. A certain imperatives numbermust be respected, which we cite.

Results: Our results showed that the complete 3D Printing Dentures with 3D Printers Today, 50 million dentures are manufactured annually in the world, but only 1% is digitally. Traditional dentures manufacturing is complex and the learning curve is intensive. Dental laboratories are finding it increasingly difficult to find technicians with the skills and expertiserequired for their production. While the manufacturing process for creating digital dentures differs from the traditional workflow, the patient process is very similar. This application guide details the most important aspects and steps to go from digitized models for each patientto 3D printed full dentures on Form labs desktop stereo lithography 3D printers

Conclusion: CAD is a geometric proposal made by the software to the prepared toothmodeling. It is therefore necessary to understand that it is the preparation that must adapt tothe CAD and not the other way around. It is also necessary to respect the scanning protocol because an optimized CAD requires a successful optical impression. Once the prosthesis digital model has been validated, manufacturing is launched. We found the prosthetic part modeling (CAD) and the computer file processing **(**FAO).

Keywords: 3D printing; PR technologies; CAD; Odontology with the CFAO.

Acknowledgment: We will see the continuity in our next article! List here those individuals who provided helpduring the research.

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ICCPH'24 International Conference on Cancer and Public Health

Adhesion in 2024

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Abstract:
Adhesion has become an essential practice in all dental offices. It plays a fundamental role in many disciplines
Objective: This study aims to explore the technical and aesthetic challenges related to the single-tooth restoration of anterior teeth, while highlighting advances in dental adhesive chemistry. It focuses on the bonding of various materials (ceramic, glass-ceramic, zirconia) and the impact of innovative techniques in the daily practice of dentists.
Materials and Methods: A thorough overview was conducted based on clinical examples and recent scientific studies. Different types of adhesives were analyzed in terms of chemical composition, application, and effectiveness. Clinical cases of anterior restorations were examined to evaluate the performance of modern materials in both aesthetic and functional contexts.
Results: The results show that advances in dental adhesive chemistry have significantly improved the durability and aesthetics of restorations. The ability to bond diverse materials has expanded therapeutic options, allowing for personalized solutions for each patient. These innovations also provide better integration of restorations into natural dental arches.
Discussion and Conclusion: Modern adhesion techniques represent a true turning point in contemporary dentistry. Although technical challenges remain, particularly in the selection of materials and their clinical application, the benefits in terms of aesthetic and functional outcomes are undeniable. The use of advanced technologies and innovative materials enables successful fulfillment of patient expectations, while also strengthening the treated tooth.
Keywords: Collage, Adhesion, Ceramic,

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Gastric cancer: 03-year review at the University Hospital of Oran

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Abstract:

Background: Stomach cancer is still a public health problem in many countries[1], responsible for almost 5,000 deaths a year despite its decline in recent years. Diagnosis is now facilitated by echo-endoscopy, which reveals thickening of the gastric wall, and the management of patients with gastric cancer must be multidisciplinary[2]. The aim of this study was to investigate the clinical and pathological features of gastric cancer patients, and their therapeutic management.

Methods: This study concerns a retrospective series of gastric cancer extended over a 03-year period from 2020 to 2023, and involved all patients admitted to the oncology department of the EHU of Oran. The parameters studied were age, sex, clinical signs, daily habits, tumor topography, histological types, macroscopic aspects, degree of differentiation, metastases, tumor markers, mode of therapy.

Results: The results showed that gastric cancer affects men (67%) much more than women, with a sex ratio M/F=2 and an age range of [55-74], with an average age of 61±12 years. Epigastric pain and progressive weight loss were the most common signs observed in patients, as were melena and haematemesis, leading to anaemia and even severe anaemia. CT and MRI findings confirmed the presence of several secondary locations, including liver metastases, which accounted for 27%, while some patients had 2 to 3 metastases at the same time (liver + peritoneal or pulmonary). Moderately differentiated gastric antropyloric ulcerating-bourging adenocarcinoma was the most common in the study population. The main strategies used in the treatment of gastric cancer were:

Chemotherapy and radiotherapy: 73% of patients underwent chemotherapy, with XELOX a potent chemotherapy used in 33% of patients. Radiotherapy was recommended for only 3 patients.

Surgery: gastrectomy with lymph node dissection and gastrojejunal anastomosis was the most common treatment, observed in 55% of patients.

Conclusion: In the context of complementary treatments to surgery for gastric cancer, the place of radiotherapy in relation to chemotherapy has not yet been clearly established. Avoiding excessive tobacco and alcohol consumption, paying attention to the amount of salt added to meals, and hygiene remain among the preventive measures against stomach cancer, thus reducing mortality.

Keywords: Stomach, retrospective, adenocarcinoma, chemotherapy.

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Prevalence and risk factor factors of postpartum depression in Chlef province: a cross sectional study

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Abstract :

Background: Postpartum depression (PPD), is a mental illness that affects women after six weeks of childbirth, it is characterized by mood disorders.

Methods: To assess the prevalence of postpartum depression as well as the risk factors, a cross-sectional survey was conducted on 200 women in the Chlef province between March and June 2023.

Results: The results of this study show that 10.50% of mothers have a PPD with an average age of 20 to 30 years (80%), unemployed (73%), live in an urban area (76%), and they have more than 4 children (79%). Women in this survey suffer from certain chronic diseases (78%) such as diabetes and high blood pressure. Two factors have been found to have a significant impact on postpartum depression, which are the absence of information about this disorder as well as postpartum care with a value of p=0.00626, p=0.00023 respectively.

Conclusion: This study was able to demonstrate the importance of early detection of postpartum depression in order to reduce the serious consequences on the mother as well as the baby

Key words: Postpartum depression, prevalence, risk factors, women, Chlef.

Epidemiological and Clinical Insights into Breast Cancer in Relizane

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Abstract:

Background: Breast cancer is the most common cancer in women, surpassing colorectal and lung cancer. Tumor markers are protein substances or hormones produced by cancerous tissues, such as CA15-3 and ACE, which are specific tumor markers for breast cancer. Our study aimed to investigate the epidemiological, clinical, and therapeutic aspects of breast cancer in Relizane and evaluate the relevance of tumor markers in patient management.

Methods: We conducted a descriptive retrospective study on 470 breast cancer patients, aged between 22 and 90 years, registered at the Oncology Center of Relizane between January 1, 2019, and December 31, 2022.

Results: Our investigation revealed that breast cancer is steadily increasing, significantly affecting women (male-to-female ratio = 0.028), especially married women in rural areas. The most affected age group was between 40 and 49 years with an average age of 53.06 ± 14.8 years. Late menopause was a risk factor in our study, and half of our patients had a first or second-degree relative with a history of breast cancer. The predominant histological type was carcinoma, with equal involvement of the left and right breasts. Our population showed a predominance of stage I and II breast cancers and HER2+ molecular subtypes; however, only 11.5% of cases had developed metastases. Our study revealed a statistically highly significant relationship between metastasis development and elevated levels of tumor markers CA15-3 and ACE with p=0.0001. CA15-3 and ACE levels were high in patients who developed metastases, accounting for 89.19% and 32.96% of cases, respectively. This confirms that a high level of a tumor marker is an indicator of tumor spread to lymph nodes or other organs such as the lungs and liver.

Conclusion: Tumor markers are a crucial tool for diagnosing a patient's condition, predicting and monitoring their response to certain treatments, and detecting cancer recurrence. This facilitates optimal management of breast cancer patients.

Keywords: Breast cancer, Tumor markers, Epidemiological aspects, CA15-3, ACE. stpartum depression, prevalence, risk factors, women, Chlef.

Reprocessing effectiveness of gastrointestinal endoscopes in western Algeria Hospitals : Infectious risk, biofilm formation and corrective measures

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Abstract

Background: The significant increase in endoscopic procedures can lead to a potential source of cross-infection accompanied by biofilm formation on the devices when the disinfection procedure is unsuitable.

Aims: This study aims to evaluate the treatment procedures of endoscopic material in 6 gastroenterology units in the west of Algeria, including the microbiological quality of the endoscope channels, the capacity of the strains to form a biofilm, the production of EPSs, and finally, to implement some corrective measures for a good disinfection of such devices.

Methods: A total of 132 samples from endoscopes were examined over a period of 2 years. Identification of the isolates was made by MALDI Biotyper System. Biofilm formation was detected by tissue Culture Plate method (TCP). The endoscope drying effectiveness was analyzed by CFU count and Scanning Electron Microscopy (SEM).

Results: A total of 150 isolates were identified with the presence of a wide variety of bacterial species such as: *S. aureus, P. aeruginosa, K. pneumoniae* and others. Using TCP method, 64% of the isolates were good biofilm producers *in vitro* due to their high capacity to produce EPSs. The disinfectant (glutaraldehyde 2%) remained ineffective on sessile cells even after prolonging contact time. Proper drying reduced significantly the rate of CFU growth for all channels with absence of indicators bacteria. Drying had a better inhibition on biofilm formation, these results were confirmed by SEM where a very low abundance of biofilms was observed.

Conclusion: The treatment of endoscopy equipment is deficient and poses a problem in our health care institutions. Rigorous cleaning/disinfection and drying with compressed air are essential elements that reduce the contamination level and biofilm formation inside endoscopes.

Keywords: GI endoscope, bacteria, contamination, biofilm, disinfection, drying

Down syndrome: A cytogenetic study for some cases from Tlemcen region

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Abstract:

Background: Down syndrome is the most common type of chromosomal abnormality found in newborns. It is associated with mental retardation and characteristic facial features. In one third of cases, the clinical diagnosis of Down syndrome may remain unproven.

This study was conducted to validate the clinical diagnosis of probable cases of Down syndrome by cytogenetic analysis and to examine different risk variables associated with trisomy 21 in a group of patients from the western region of Algeria, Tlemcen.

Methods: This study was carried out on 22 patients with the clinical diagnosis of Down syndrome and 20 control subjects from the Psychomotor Centre for mentally handicapped children of Tlemcen (Maghnia- Souani) during 2013-2016. Karyotype analysis was performed in all cases. Two methods were used, GTG band and RTG band, according to the standard protocols.

Results: Of the 22 cases with Down syndrome, 20 cases (91%) were free trisomy 21. One case (4.5%) had translocation Down syndrome. Another case had mosaic Down syndrome. There was an excess of males over females; the sex ratio was 1.75:1. The mean maternal age at birth of the affected children was 36.27 ± 7.59 years. It was significantly higher than that of mothers of non-trisomic children (27.83 ± 6.34 years; P = 0.0002).

Higher parity was an important risk factor associated with trisomy 21; 81% of affected children were in the last or second last birth order. Paternal age and consanguinity had no effect.

Conclusion: It is crucial to identify certain chromosomal abnormalities in children with Down syndrome. It has been very beneficial in the management of these children and in educating the affected families about the possibility of recurrence and alternative solutions.

Keywords: Cytogenetic, Down syndrome, Trisomy 21, karyotype, maternal age,

Impact of Radiation on Leukemic Blast Viability: Towards Optimized Therapeutic Approaches

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Abstract:

Background: This study investigates the impact of X-rays and strontium-90 (Sr-90) on blood cells, focusing on their effect on blast cell viability in leukemia patients. By employing a range of measurement techniques, the research aims to deepen our understanding of how these radiations affect leukemia cells. The findings could provide valuable insights into optimizing treatment approaches and improving therapeutic strategies in oncology.

Methods: The study investigates the effects of X-rays and strontium-90 (Sr-90) on blood samples from three leukemia patients, focusing on the quantification of blasts after exposure at intervals of 5, 10, and 15 minutes. The exposure conditions were as follows:

- **X-rays:** Samples were exposed using a PHYWE device (copper X-ray tube) at 35 kV and 1000 pulses per second for controlled exposure.
- **Strontium-90 (Sr-90):** Emitted energy of 546 kV with a variable pulse scheme: 2400 pulses for 5 minutes, 4800 for 10 minutes, and 7200 for 15 minutes. To quantify the blasts, two measurement techniques were used:

- **May-Grünwald-Giemsa (MGG) Staining:** Counts blasts, including dead or damaged cells, which may influence the results. Samples were prepared according to standardized protocols.
- **Flow Cytometry:** Distinguishes live cells from dead ones, allowing for precise viability analysis. These methods were used to rigorously assess the impact of radiation on blast viability.

Results: The study highlighted several important findings regarding the effects of X-rays and strontium-90 (Sr-90) on blood samples from leukemia patients. While May-Grünwald-Giemsa (MGG) staining showed a consistent blast count after 5, 10, and 15 minutes of radiation exposure, flow cytometry revealed a significant reduction in both the number of blasts and cell viability. This discrepancy arises because MGG staining counts both viable and damaged cells, whereas flow cytometry can distinguish between live and dead cells. The results further indicated that X-rays and Sr-90 produced similar effects in reducing viable leukemic cells, with no significant difference in cell mortality between the two. The study underscores the importance of accurate measurement techniques in assessing radiation treatments for leukemia and suggests further research to refine radiation doses, exposure times, and to explore potential combined therapeutic approaches.

Conclusion: In conclusion, this study illustrates the effects of X-rays and strontium-90 on blast cell viability in leukemia samples, emphasizing the need for precise measurement methods. The findings underscore the importance of further research to refine radiotherapy protocols and investigate the potential benefits of combination therapies.

Keywords: Leukemia, X-rays, Strontium-90 (Sr-90), Blasts, Flow Cytometry, Cell Viability, May-Grünwald-Giemsa (MGG) Staining, Cell Mortality

The importance of personalized medicine and predictive biomarkers in oxaliplatin based colorectal cancer treatment.

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Abstract:

Background: Oxaliplatin, a commonly employed chemotherapy agent in the treatment of colorectal cancer, is often linked to significant neurotoxic side effects, leading to peripheral neuropathies that can disrupt treatment and reduce patients' quality of life. This study investigates the relationship between genetic polymorphisms, particularly in the ABCB1 and CYP3A5 genes, and oxaliplatin-induced neurotoxicity.

Methods: A cohort of 200 colorectal cancer patients receiving oxaliplatin-based chemotherapy was studied. In addition to a detailed questionnaire on the patients' medical history, diet, and lifestyle habits, DNA was extracted from blood samples. Genetic polymorphisms in the ABCB1 and CYP3A5 genes are analyzed using PCR-RFLP, which involves amplification, enzyme digestion, and electrophoresis for genotyping, and real-time PCR, utilizing allele-specific TaqMan probes to detect variants through fluorescent signals. The results were correlated with the occurrence and severity of neurotoxicity.

Results: Our data indicate that 93.38% of patients experience neurotoxicity, while 7.62% do not. Among those affected, 64.95% have grade 1 neurotoxicity, 31.96% grade 2, and 3.09% grade 3. Genetic testing has identified potential high-risk genotypes linked to neurotoxicity.

Conclusion: The findings underscore the potential of personalized medicine to reduce oxaliplatin-related neurotoxicity by tailoring treatments based on genetic profiles. This approach promises to optimize therapy, improve outcomes, and minimize treatment interruptions, highlighting the value of genetic testing in colorectal cancer management.

Keywords: Oxaliplatin, Chemotherapy, polymorphisms, Biomarkers, Neurotoxicity, Colorectal cancer.

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The importance of personalized medicine and predictive biomarkers in oxaliplatin based colorectal cancer treatment.

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Abstract:

Background: Oxaliplatin is a platinum-based chemotherapy agent commonly used to treat colorectal cancer, but it is often associated with significant neurotoxicity, which can lead to acute and chronic peripheral neuropathies. This neurotoxicity may cause treatment delays, undermining the overall effectiveness of therapy and negatively affecting patients' quality of life. The objective of this study is to evaluate the efficacy of personalized medicine in managing colorectal cancer, with a specific focus on patient responses to oxaliplatin and strategies to reduce its neurological toxicity.

Methods: Our research involves a cohort of 200 colorectal cancer patients undergoing oxaliplatin-based chemotherapy. We focus on genetic analyses to delve into the mechanisms of action of oxaliplatin, utilizing advanced genetic testing to identify predictive biomarkers. This allows us to formulate personalized therapeutic strategies tailored to each patient.

Results: Our findings demonstrate that the personalized medicine approach effectively predicts patients' susceptibility to oxaliplatin-induced neurotoxicity. By pinpointing high-risk patients, we have implemented more precise therapeutic approaches, resulting in a decrease in unnecessary oxaliplatin administration. This customization of treatment plans has minimized treatment interruptions and improved patient care, laying the groundwork for more precise and efficacious treatments.

Conclusion: In summary, tailoring colorectal cancer treatment through personalized medicine, alongside sophisticated genetic analyses and predictive biomarker identification, represents a significant advancement. This approach enhances clinical outcomes while mitigating the toxicity associated with oxaliplatin-based chemotherapy. Additionally, it offers substantial cost savings by avoiding unnecessary medication use and optimizing patient care, fostering significant progress in the treatment of colorectal cancer.

Keywords: Oxaliplatin ,chemotherapy, colorectal cancer, neurotoxicity, biomarkers.

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Matrix metalloproteinase and oxidative stress in systemic lupus erythematosus

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Abstract:

Background: Systemic lupus erythematosus (SLE) is an autoimmune disease characterized by a chronic systemic inflammation and by a production of autoantibodies against nucleus components. Oxidative stress and matrix metalloproteinases (MMP) play a significant role in the immunopatholgy of SLE. The study aimed to analyze the activity of MMP-2 and MMP-9 in SLE patients and to study the implication of oxidative stress during RA by analyzing the production of nitric oxide (NO) and malondialdehyde (MDA).

Methods: The study included 30 SLE patients recruited from the Rheumatology department of Ben-Aknoun hospital in Algiers, during a period of 5 months (December-April 2023). The study included 50 healthy participants as a control group. The activity levels of MMP-2 and MMP-9 were measured in the plasma of patients and controls by zymography. Plasma titers of MDA and NO were determined with the use of the thiobarbituric acid reactive substances technique and the Griess method, respectively. Clinical and immunological data (disease activity score, visceral involvements, autoantibodies positivity) were collected from the patient's medical records.

Results: Our findings demonstrated a significant increase in the serum levels of MMP-9, NO and MDA in lupus patients compared to control ($p = 0.01$; $p < 10^{-3}$, respectively); however, no significant difference in MMP2 levels was found ($p > 0.05$). Our results demonstrated a remarkable increase in the plasma level of MMP-9 in patients with joint, skin and kidney involvement. Further, SLE patients with anti-RNP antibodies had higher serum concentrations of MMP-2 than anti-RNP negative patients ($p = 0.03$). A high disease activity score was linked to elevated MMP-9 levels. No association between MMP2/MMP-9 levels and the status of anti-double strand DNA was found.

Conclusion: This study suggests that oxidative stress markers (NO, MDA) and MMP-9 could be a useful inflammatory biomarkers for SLE progression and aggravation.

Keywords: Systemic lupus erythematosus, malondialdehyde, matrix metalloproteinase-2, matrix metalloproteinase-9, nitric oxide, oxydative stress.

Exploration of the link between mineral status, metabolic and cardiovascular parameters in patients sorrowing from type 2 diabetes

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Abstract:

Background: Dyslipidemia and mineral metabolism abnormalities are not uncommon complications in patients with type 2 diabetes mellitus (T2D), they constitute an increasing threat of cardiovascular diseases. This study aimed to investigate the link between serum calcium and magnesium levels and their relationship with lipid profiles in patients with T2D in northwestern Algeria.

Methods: The cross-sectional study included 116 diabetes patients aged between 41-90 years old. Serum calcium and magnesium levels have been measured via an automatic biochemistry analyzer Selectra Pro M, as well as total cholesterol, triglycerides, LDL-c and HDL-c, were accomplished by enzymatic colorimetric methods. Statistical analysis was performed using SPSS software version 27.0 (IBM Corp., Armonk, NY, USA, 2020 and the differences between quartiles were analyzed by ANOVA, and linear regressions were performed to assess the association between mineral variables, metabolic and cardiovascular parameters. Anthropometrics measurements and questionnaires were also performed.

Results: The outcomes of our study indicate that women are the most present in the study (91 women *vs.* 25 men), with a mean age of 67.41±10.12 years (between 41 and 90 years). The residual plots revealed that higher calcium levels were associated with increased TC/HDL ($\mathbf{r^2}$ = 0.032, $\boldsymbol{p}$ = 0.055) and LDL/HDL ($\mathbf{r^2}$ = 0.048, $\boldsymbol{p}$ = 0.018) ratios. While, lower magnesium levels were significantly associated with higher TG/HDL ratio ($\mathbf{r^2}$ = 0.008, $\boldsymbol{p}$ = 0.343). As well as the curves for Ca/Mg ratio suggests a potential linear relationship for TG/HDL.

Conclusion: The study suggests that Ca, Mg levels and the Ca/Mg ratio may be important factors to consider in the management of T2DM as well as further research is needed to clarify the role of mineral status in the pathogenesis of T2DM and associated cardiovascular complications

Key words: Type 2 diabetes, Metabolism, Cardiovascular complications, Mineral status, Calcium, Magnesium

Inflammatory Cytokine Profile in Right-Sided versus Left-Sided Colon Cancer: Implications for the Clinical Management of Algerian Patients

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Abstract:

Background: Colorectal cancer exhibits heterogeneity depending on tumor location within the colon. This study aims to compare the inflammatory biomarker profiles in Algerian patients with right-sided and left-sided colon cancer to assess their prognostic significance.

Methods: Venous whole blood samples were collected in EDTA tubes from patients (n=128) categorized into right-sided colon cancer (n=57) and left-sided colon cancer (n=61). Cellular ratios (NLR, PLR, MLR) and levels of inflammatory markers such as C-reactive protein (CRP), nitric oxide (NO), myeloperoxidase (MPO), eosinophil peroxidase (EPO), and cytokines (IL-6, IL-10, TGF-β, TNF-α) were analyzed. A comparative statistical analysis was performed to evaluate differences between both cancer types.

Results: Patients with right-sided colon cancer exhibited significantly higher levels of PLR, NLR, NO, CRP, and TGF-β ($p<0,0001$), while MPO and EPO were more elevated in left-sided colon cancer . IL-6, IL-10, and TNF-α concentrations were comparable between the two tumor locations, whereas MLR activity was marginally increased in right-sided colon cancer without reaching statistical significance.

Conclusion: Our findings reveal distinct inflammatory profiles between right- and left-sided colon cancers, indicating differentiated pathological mechanisms and immune responses. This distinction could influence risk stratification and therapeutic strategies in colorectal cancer management. Further studies are required to elucidate the impact of these biomarkers on clinical decision-making and treatment outcomes in colorectal cancer patients.

Keywords: Colon Cancer, Cytokines, Right-Sided, Left-Sided, Biomarker.

Inflammation-related biomarkers as predictors of treatment response in advanced colorectal cancer

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Abstract

Background: Metastatic colorectal cancer (mCRC) is a major cause of cancer-related mortalities worldwide. Emerging evidence suggests that oxidative stress and inflammation significantly contribute to the development of resistance to chemotherapy and targeted therapies in mCRC patients. Excessive accumulation of reactive oxygen species (ROS) and elevated levels of pro-inflammatory cytokines foster tumor cell survival and enable them to evade apoptosis triggered by anticancer treatments. This study aimed to evaluate post-chemotherapy ROS and inflammatory biomarkers in patients with mCRC and their correlation with the treatment response.

Methods: A cohort of 35 patients with mCRC was recruited from the Oncology Department of Rouiba University Hospital. All patients received a standard chemotherapy regimen consisting of bevacizumab, capecitabine, and oxaliplatin (BCapOx). Oxidative stress markers, including glutathione (GSH) and hydrogen peroxide (H_2O_2), and enzymes, such as myeloperoxidase (MPO) and eosinophil peroxidase (EPO), were quantified. Additionally, tumor necrosis factor alpha (TNF-α), interleukins 10 (IL-10) and transforming growth factor (TGF-β) were analyzed to assess their association with treatment outcomes.

Results: Significant increases in GSH, IL-10, and TGF-β levels were observed ($p < 0.05$, $p < 0.01$, $p < 0.01$) respectively were observed in responders compared with non-responders. Conversely, higher levels of MPO, H_2O_2, EPO, and TNF-α were found in non-responders ($p<0.01$), indicating a stronger oxidative and inflammatory response in these patients.

Conclusion: These findings underscore the potential of oxidative stress and inflammatory biomarkers as predictors of therapeutic response in metastatic colorectal cancer. Blood levels of oxidants and antioxidants biomarkers could serve as valuable indicators for predicting responses to cancer therapies, particularly for assessing the risk of resistance to antitumor drugs.

Keywords: Colorectal cancer, oxidative stress, inflammatory biomarkers, treatment response, chemotherapy.

Innovative techniques for avulsion surgery of impacted wisdom teeth and microsurgery

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Abstract:

Background: Minimally invasive oral surgery is a term that describes the application of a highly precise and delicate surgical procedure that aims to reduce both immediate and long-term complications while performing the same surgical procedures. These technological and technical developments mean that, both medically and ethically, the only relevant and appropriate therapeutic model is one based above all on tissue preservation and minimally invasive treatments. This model is known as modern minimally invasive dentistry.

Material and Methods: In this work, we are interested in minimally invasive oral surgery and innovative techniques. We report the case of avulsion of a minimally impacted mandibular wisdom tooth and a review of the literature using databases such as: Pub Med, science direct

Results: microsurgery finds its application in soft-tissue management, insofar as healing is healing is rapid thanks to primary site closure.

It enables the initial tissue architecture to be maintained, with fine incisions, small flaps are used, preserving as much soft tissue as possible.

Thus, sutures should be performed with needles of smaller diameter and length to cause less trauma, and with monofilament sutures.

Minimally invasive surgery is particularly useful for manipulating hard tissue with selective osteotomies.

The use of piezosurgery in the extraction of impacted mandibular wisdom teeth is recommended in current surgical practice. This method enables efficient, precise and safe ossicular surgical cuts, and is selective and non-traumatic in view of the proximity of key anatomical elements (inferior alveolar nerve, lingual nerve).

Conclusion: Avulsion of the impacted mandibular wisdom tooth is an oral surgery commonly performed with the conventional extraction technique.

Minimally invasive surgery is currently a breakthrough in modern dentistry, but its requirements still have to be met in terms of both people and equipment.

Keywords: modern minimally invasive dentistry, microsurgery, wisdom tooth

Acknowledgment : I wanted to express my sincere gratitude « Dr. DARRAB Billal » for the outstanding technical support you have provided recently " Pixel perfection " and especially tuto

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Anti-cancer Activity of Bee Venom in Induced Colon Cancer Swiss Mice

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Abstract:

Background: Humans used to exploit products derived from the hive, such as honey, propolis, and venom, both for nutritional and medical purposes. The beneficial effects of these products are well-established in daily life for treating pathologies such as neuropathies, inflammatory diseases, and cancer. The aim of this study was to investigate the anticancer activity of Algerian bee venom (BV), specifically its therapeutic efficacy in Swiss mice model of colon cancer.

Methods: This study used 28 male Swiss mice, weighing between 22 and 26 g. Colon cancer was induced using azoxymethane (AZ) at 0.6 mg/ml. The BV from *Apis mellifera intermissa* was prepared at a concentration of 0.115 mg/ml. Mice were divided into four groups: control, venom-treated, negative and positive control. Treatments were administered for 14 consecutive days, during which weight, food, and water consumption were monitored. Mice were euthanized, then, biochemical and haematological parameters and histological examination of colon tissue were performed. Data were analyzed using ANOVA; statistical significance was set at $p < 0.05$.

Results: Results showed that AZ induced tumour inflammation in mice, resulting in a significant reduction in body weight, food and water consumption, and an increase in colon weight. Treatment with BV attenuated these manifestations. Furthermore, AZ increased white blood cells but decreased red blood cells, hemoglobin, and hematocrit, while VB treatment moderates these changes, restoring hematological balance. Additionally, AZ elevated C-reactive protein levels, but BV reduced this inflammatory response. On the other hand, macroscopic and histological observations revealed colonic lesions in AZ-treated mice, while combined treatment with VB showed mild alterations, characterized by moderate dysplasia compared to untreated group.

Conclusion: The BV treatment significantly improved physiological parameters, reduced colon lesions, and exhibited anti-inflammatory and immunomodulatory effects. These results provide promising evidence for the potential use of BV as a complementary therapeutic approach in colon cancer treatment, opening new therapeutic perspectives in oncology.

Keywords: Azoxymethane, Bee venom, Carcinogenesis, Colon cancer, Swiss mice.

Analyses of Infections by Different Variants of Human Papillomavirus (HPV) in the Population of Western Algeria

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Abstract:

Background: Human papillomaviruses (HPVs) are highly prevalent in the population, with an estimated 80–90% of individuals believed to be infected at some point in their lives. These viruses, which exhibit epithelial tropism, are responsible for a variety of skin and mucosal lesions. Out of the 150 identified HPV genotypes, they are categorized into high oncogenic risk (HR-HPV) and low oncogenic risk types. Among the 24 highly oncogenic genotypes are types 16, 18, 26, 30, 31, 33, 34, 35, 39, 45, 51, 52, 53, 56, 58, 59, 66, 67, 68, 69, 70, 73, 82, and 97. This study aimed to assess cervical lesions and high-risk HPV infections, particularly focusing on the differentiation of types 16, 18, and 45 in Western Algeria.

Methods: A total of 3,386 cervical samples from women at risk of HPV infection were analyzed at the Genethical laboratory to detect infections using qPCR and identify cytological abnormalities.

Results: Among the total samples, 11% (372 cases out of 3,386) were found to have high-risk HPV (HR-HPV) infections. HPV-16 was the most prevalent, accounting for 38% of cases, followed by HPV-18 at 16%, and HPV-45 at 2%. The remaining infections (44%) were associated with other high-risk HPV types, though these were not further specified. No significant correlation was observed between cytological abnormalities and the detection of high-risk HPV among the infected women.

Conclusion: Given the high prevalence of HPV infections in this high-risk population, it is essential to implement regular gynecological screening and close monitoring to manage and detect potential complications.

Keywords: Human papillomavirus, High-risk HPV (HR-HPV), Cervical lesions, qPCR analysis, Cytological abnormalities

Estimation of Imatinib-induced changes in circulating biochemical markers, dietary habits and risk factors in BCR-ABL-positive chronic myeloid leukemia patients

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Abstract

Background: Chronic myeloid leukemia (CML) is classified as a myeloproliferative neoplasm. The purpose of this study was to investigate biochemical changes in CML patients, assess their dietary frequency and identify risk factors.

Methods: A retrospective survey included 18 CML patients and 30 healthy controls. Blood samples were collected for biochemical analysis and specific numerical data (erythrocytes, white blood cells and platelets), as well as leukocytes count. Information and dietary frequency were obtained by means of a baseline interview.

Results: The molecular hallmark i-e the BCR-ABL1fusion transcript varied from 0.01 to 66% at the target group. The mean age ranged from 51.21±8.89 to 54.58±11.97 years; ($p<0.01$), and the BMI from 27.57±4.79 to 29.31 ± 3.48 kg/m^2 ; ($p<0,00006$) for CML cases and controls respectively. Most of the patients were exposed to pesticides (28,57%), medical radiations (57.14%), chemical products (28.57%) and plastics production (14.28%). TG levels were significantly elevated in cases (1.27±0.35 *vs* 0.86±0.29g/mL; ($p<0.0001$). Imatinib-induced nephrototoxicity showed a hyperuraemia i.e. 0.38±0.3 *vs* 0.27±0.04g/L, ($p<0.05$). The UA and creatinine levels were higher in patients (52±6.14 *vs* 38±6.56mg/L; ($p<0.0005$) ; (11.01±1.16 *vs* 8.97±0.99mg/L; ($p<0.0002.10^{-3}$). Hepatotoxicity was reflected by an increase in AAT (45±7.74 *vs* 17±2.06 IU/L; $p<0.0002.10^{-6}$)), GGT (25±3.70 *vs* 21±0.87 IU/L, $p<0.05$), AP (187.19±29.09 *vs* 162±8.94 IU/L; $p<0.04$), and TB (9.39±2.66 *vs* 6.68±2.06 IU/L; $p<0.04$) in cases. The electrolyte disorders highlighted a hyponatremia in cases (112±0.78 *vs* 135±0.00 mEq/L; $p<0.005$), hypokalaemia (2.8±0.6 *vs* 4.7±0.00g/L; $p<0.012$) and hypomagnesaemia (17.88±0.53 *vs* 21±1.41mg/L; $p<0.04$). In contrast, a hypoalbuminemia was detected in cases, i.e. 41.63±2.35 *vs* 46.00±3.00 g/L; $p<0.002$). The food frequency revealed an elevated consumption of protein food.

Conclusion: The rate of exposure to the risk factors was relatively high. The dietary frequency of showed a high consumption of protein sources to the detriment of fruit and vegetables. Biochemical impairments and toxicity were revealed during treatment.

Keywords: Chronic lymphocytic leukemia – Hyperlymphocytosis – Metabolic disorders - Risk factors - Food frequency.

Abreviations:

TG: Triglycerides**; AP**: Alkaline phosphatase; **TB:** Total bilirubin; **K:** Potassium; **UA:** Uric acid; **ASAT:** Aspartate alanine transferase; **ALAT:** Alanine amino-transferase; **GGT:** Gamma glutamyl transpeptidase;

Investigation of metabolic changes in a population with chronic lymphocytic leukemia undergoing chemo-immunotherapy

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Abstract

Background: Chronic lymphocytic leukemia (CLL) is characterized by hyperlymphocytosis. The aims of this study were to investigate biochemical and hematological impairments in CLL patients and to evaluate the risk factors.

Methods: This case-control study included 17 CLL patients and 39 healthy controls. Blood samples were taken for biochemical analysis and specify quantitative data (erythrocyte, white blood cells and platelets), including the leukocytes formula. The information and food frequency were collected using a basic interview.

Results: The mean age ranged from 72.76 ± 9.41 to 67.30 ± 7.61years; ($p<0.01$) for CLL cases and controls respectively. BMI rescheduled significantly from 22.94 ± 1.54 to 29.31 ± 3.48 kg/m^2 ; ($p<0,00006$). Most of the patients were farmers, exposed to pesticides, animals and chemical products. Smoking is also a risk factor, to being consumed at an early age (17 ± 2,12 *vs* 19,5 ± 2,29years for CLL cases and controls. Hematological parameters showed a significant accumulation of lymphocytes, i.e. 52.29 ± 55.98.10^3/mm^3; ($p<0.002$) for cases *vs* controls (2.09 ± 0.54.10^3/mm^3), associated with an abnormal significant fall in the number of red blood cells ($p<0.03$) and platelets ($p<0.004$). Lower significant levels in cases were observed for cholesterol, creatinin, proteins, albumin, AP, TB and K, in contrast to blood glucose, urea, UA, ASAT, ALAT, GGT, calcium and CRP. The latter as a markers of inflammation, underlined 133.94 ± 16.95 *vs* 3.03 ± 0.81mg/L in CLL cases and controls. The food frequency revealed a significant increased consumption of all protein-rich foods. Sweet products and added fats were consumed less.

Conclusion: Metabolic disorders become more pronounced during CLL treatment. Campaigns to raise awareness of the risk of exposure to factors triggering the disease would be recommended. The diet plays a fundamental role in the regulation of chronic inflammation; it can minimize treatment-related side-effects.

Keywords: Chronic lymphocytic leukemia – Hyperlymphocytosis – Metabolic disorders - Risk factors - Food frequency.

Abreviations:

AP: Alkaline phosphatase; **TB:** Total bilirubin; **K:** Potassium; **UA:** Uric acid; **ASAT:** Aspartate alanine transferase; **ALAT:** Alanine amino-transferase; **GGT:** Gamma glutamyl transpeptidase; **CRP:** C-reactive protein.

Epidemiological Insights into Upper Aerodigestive Tract Cancer in Western Algeria

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Abstract:

Background: Squamous cell carcinoma (SCC) of the head and neck (HN) encompasses a heterogeneous group of malignant tumors originating from the epithelia of the upper aerodigestive tract (UADT), which includes tumors of the oral cavity, lips, pharynx, and larynx. With nearly 745,000 new cases and more than 360,000 deaths per year worldwide in 2020, these cancers are ranked sixth in terms of incidence. Traditionally, the majority of these cancers were linked to alcohol and tobacco, a new risk factor has been highlighted in the particular case of oropharyngeal cancers: the human papillomavirus (HPV), mainly HPV16 and 18. The aim of this work is to carry out a retrospective epidemiological study on upper aerodigestive tract cancer in the wilaya of Tlemcen (West Algeria) over a period of 5 years (2012–2016).

Methods: The data set was provided by the cancer registry of the Tlemcen wilaya. The statistical analysis was performed using software SPSS.23 and Microsoft Excel® 2013.

Results: During this period, 966 cases of upper aerodigestive tract cancers were collected, including 640 patients with cancers of the oral cavity, 212 patients with cancer of the pharynx and 114 patients with cancer of the larynx. the age group from 60 to 69 years old was the most representative with 29.40%. UADT cancers were more common in males with a percentage of 75% versus 25% in females. This cancers ranked in 10th rank of the ten most answered cancers in this region.

Conclusion: In 2020, Algeria recorded 2671 new cases and 1558 deaths by UADT cancers whose main cause of occurrence is poorly understood, which calls for epidemiological studies with an exploration of non-virological (tobacco, alcohol ...) or virological (HPV, EBV) risk factors to better understand the etiology of these cancers and to propose health actions.

Keywords: cancer, SCC, UAT, HPV, RT-PCR

Clinical Investigation Into West Nile Virus In The Region Of M'sila;Algeria

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Abstract:

Background: West Nile virus (WNV) is an arbovirus belonging to the Flavivridae family, genus Flavivirus (Kramer et al., 2007). The most affected arbovirus in the world, its natural cycle involves birds which constitute the reservoir and ornithophilous mosquitoes, mainly of the Culex genus, as vector. Contamination of humans and horses occurs accidentally. VWN has become a major public and veterinary health problem in Europe and the Mediterranean basin and then the United States of America. In Algeria, the virus was isolated for the first time in 1968 at the Pasteur Institute in Algiers,

Methods: The clinical investigations carried out on cases infected and suspected of VWN,were carried out during the months of March 2024 using a questionnaire form, these investigations allowed us to draw up a list of patients in the M'sila region. and the other municipalities, The tool of our investigation is a form made up of six parts, the first is based on the person surveyed, the second part collects information concerning clinical history of the cases.Regarding the results obtained for this clinical investigation, we calculated using the R software version 4.2.2.

Results: This present study to detect the state of West Nile virus in our M'sila region and the differences in symptotic signs in patients infected with this virus; to assess the true epidemiological situation of this arbovirus. This present investigation allowed us to detect that our sample is balanced with a SEX-RATIO=1/1, people aged 1 to 10 years are the most affected with the virus with a percentage (44.83%), the population studied indicates a strong symptomatic sign with severity of 80% for altered consciousness, coma convulsion and neck stiffness. The results also study some blood parameters of the cases studied; for the proteins and the Polynuclear the values present by low rates, on the other hand the two parameters Glucose and the lymphocytes the rates are high (100%) in the majority of cases

Conclusion : Despite the size of the sample remains insufficient to meet the real objective which is to study the real prevalence of this virus in the regions concerned because the relative precision is quite low, and despite all the obstacles encountered this work allowed us to have an overall idea of the disease in this territory,

Keywords: clinical investigation, west nile virus, arbovirus, M'sila

Study of the Clinical-Biological Characteristics of Psoriasis in the Region of Sidi Bel Abbès

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Abstract:
Background: Psoriasis is a multifactorial erythematous-squamous dermatosis, with an unknown etiology and a chronic progression. This condition affects 125 million people worldwide, including one million in Algeria. This study aims to describe the clinical and biological characteristics of psoriasis in the region of Sidi Bel Abbes.
Methods: 79 patients with psoriasis were included in this retrospective study conducted at the dermatology department of the "Hassani AEK" university hospital in the region of Sidi Bel Abbes.
Results: In total, 53.16% of the participants were women and 46.84% were men. The average age at diagnosis was 32.96 ± 21.46 years. Plaque psoriasis (vulgaris) was the most common form, accounting for 32.9% of cases, followed by guttate psoriasis (29.1% of cases). The most frequently recorded triggering factors were obesity (58.23%) and stress (22.78%). The therapeutic strategy used was rotational among the various treatment options (topical, systemic, phototherapy), depending on the severity and extent of the lesions, as well as the limits of tolerance and therapeutic indications.
Conclusion: Psoriasis is a disease that is not life-threatening. Therefore, the management of this skin condition primarily depends on the patient's quality of life.
Keywords : Psoriasis, Obesity, Stress

Evaluation of biochemical, nutritional and inflammatory parameters in patients with polycystic ovary syndrome in the Wilaya of Sidi Bel Abbes

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Abstract:

Background: Polycystic ovary syndrome (PCOS) is an invasive endocrine disorder of unknown origin that requires immediate medical and dietary intervention due to its adverse effects on metabolism and reproduction [1]. The study aimed to identify the biochemical and nutritional profile of patients suffering from PCOS and evaluate the association of metabolic imbalance associated with PCOS while studying the nutritional status of patients treated in the EHS-SBA maternity hospital.

Methods: This was a retrospective study (from January 2020 to April 2024) conducted by analyzing medical records and conducting a nutritional survey over 2 months (March 20 to May 20, 2024).

Results: Our study included 65 cases of patients with PCOS. The mean age was 38.63±10.40 years, the most affected age group was 30 to 39 years. Our results showed that most patients had irregular menstrual cycles (57.38%). Our patients presented with hypertension (18.46%), type 2 diabetes (24.62%), goiter (12.31%), and anemia (7.69%). The mean CRP level was high in obese cases (34.22±15.43 mg/L) compared to non-obese cases (15.71±4.95 IU/L). The TGO rate was high in obese cases (48.45±10.25 IU/L) compared to non-obese cases (25.66±9.60 IU/L). Similarly, for the TGP rate (obese cases: 46.94±16.94 IU/L vs non-obese cases; 22.39±10.84 IU/L, p=0.030). The cholesterol level was statistically (p=0.024) higher in obese cases (2.55±0.50 g/l) compared to non-obese cases (1.92±0.24 g/l). In addition, the blood urea level was higher in obese cases (0.48±0.12 g/l) compared to non-obese cases (0.27±0.08 g/l). The mean blood glucose level was significantly higher in obese (1.76 ± 0.21 g/L) *vs*. non-obese cases (0.97 ± 0.28 g/L). Similarly, the triglyceride level was higher in obese cases (1.64 ± 0.95 g/L) compared to non-obese cases (1.56 ± 1.16 g/L). Interestingly, the blood creatinine level was higher in obese cases (12.67 ± 4.73 g/L), compared to non-obese cases (5.97 ± 0.28 g/L).

Conclusion: These biochemical dysfunctions involve problems related to carbohydrate, hepatic, and renal metabolisms, which worsens the prognosis in patients suffering from PCOS.

Keywords: Polycystic ovarian syndrome (PCOS), nutritional profile, metabolic imbalance.

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Clinical Efficacy of Vestibular Incision Subperiosteal Tunnel Access (VISTA) in the Treatment of Gingival Recessions: A Case Report

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Abstract

Background: Gingival recession is a significant concern in periodontal health, often leading to root exposure, aesthetic dissatisfaction, and increased sensitivity. Traditional surgical techniques, such as connective tissue grafting, can be associated with donor site morbidity and longer recovery times. The Vestibular Incision Subperiosteal Tunnel Access (VISTA) technique presents a less invasive alternative, allowing for effective treatment of multiple recession defects with a single vertical incision. This technique aims to enhance patient comfort while achieving favorable clinical outcomes.

Introduction: Gingival recession is a common periodontal condition that can lead to aesthetic concerns and sensitivity. The Vestibular Incision Subperiosteal Tunnel Access (VISTA) technique is a minimally invasive approach for treating gingival recession defects. This case report aims to illustrate the clinical efficacy of the VISTA technique in the management of gingival recessions through a detailed examination of a specific patient.

Methods: A 35-year-old male patient presented with multiple gingival recession defects. The VISTA technique was employed, involving the creation of a subperiosteal tunnel to access the affected areas with vertical incisions. Clinical parameters, including recession depth (RD), keratinized tissue width (KTW), and root coverage percentage (RCP), were recorded at baseline and 6 months post-operatively. A detailed narrative of the surgical procedure and post-operative recovery was documented.

Results: Pre-operative RD measured 3.0 mm at the most affected site. Following the VISTA procedure, RD decreased to 0.5 mm, resulting in an RCP of 83%. KTW increased from 2.0 mm to 3.5 mm, indicating significant soft tissue gain. The patient reported high satisfaction with the aesthetic outcome and minimal post-operative discomfort. No complications were noted during the follow-up period.

Discussion: This case report demonstrates that the VISTA technique is an effective method for treating gingival recession, yielding significant improvements in recession depth and root coverage. The minimally invasive nature of VISTA not only enhances patient comfort but also contributes to satisfactory aesthetic outcomes. The findings support the application of the VISTA technique in clinical practice for managing gingival recessions, highlighting its effectiveness in real-world scenarios. Further studies with larger sample sizes are warranted to validate these results and explore long-term outcomes.

Conclusion: The VISTA technique proves to be a viable and effective option for treating gingival recessions, demonstrating significant improvements in recession depth, root coverage, and patient satisfaction. This case report highlights the benefits of a minimally invasive approach in periodontal surgery and encourages further exploration of VISTA in diverse clinical scenarios to establish its long-term efficacy.

Keywords: Gingival recession, VISTA technique, periodontal surgery, root coverage, minimally invasive surgery

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Contribution of food rich in fatty acids on the risk of breast cancer: about a case-control study in a female population in western Algeria.

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Abstract

Background: Science does not know a single cause linked to breast cancer. The disease is attributed to a series of risk factors. Some are behavioural, linked to lifestyle habits, particularly food. Others are largely associated to genetics. The aim of this study was to characterize the nutritional profile of the population studied by analyzing the frequency of consumption of the main foods considered to be rich in fatty acids.

Methods: We opted for a case-control epidemiological study from January 2016 to March 2019. It Itook place in the Oncology and Senology Department of the Etablissement Public Hospitalier (EPH) and in Center for the fight against cancer of Sidi Bel Abbés. It included a 162 patients with breast carcinoma and 162 control women presumed healthy. Data were collected from a basic questionnaire and a dietary survey.

Results: The results obtained showed interesting results. Consumption of cheese, red meat, cold meats, fish, eggs, mayonnaise, pastries and oil seeds was significantly increased ($p<0.05$) in women with breast cancer compared with controls. Thus, we noted that higher intakes of milk were associated with an RR of 1.32 (95% CI 0.85-2.07), higher intakes of cheese were associated with an RR of 1.71 (95% CI 1.02-2.85). However, we pointed out that consumption of red meat, essentially composed of animal fat, heme iron and chemical carcinogens, was associated with an RR of 0.48 (95% CI 0.22- 1.05) and the RR for consumption of chicken skin was 1.36 (95% CI 0.77- 2.38).

Conclusion: In conclusion, it is important to note that the intake of saturated fatty acids is one of the determining environmental factors in increasing or reducing the risk of breast cancer, and can be the subject of primary prevention through appropriate changes in eating habits.

Keywords: Breast cancer, Nutritional profile, Fatty acids.

Risk factors and molecular classification of breast cancer: an epidemiological study conducted at EHU Oran

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Abstract:

Background: Breast cancer, the most common cancer in women and the leading cause of cancer death despite a decline in mortality, requires a thorough understanding of its risk factors, such as age and family history. Molecular classification is an essential tool for analyzing the expression of key biomarkers, enabling tumors to be categorized into biologically and prognostically homogeneous groups. An assessment of risk factors is therefore crucial to optimize prevention and treatment.

Methods: This is a retrospective study of 120 cases of breast tumors observed in the oncology department of EHU-Oran with records collected from 2017 to 2021 , and analyzed using SPSS 2020 software.

Results: We analyzed 120 cases, with a mean patient age of 52,38 years, ranging from 27 to 89 years, and a mean age at puberty of 13,64 years. Of these, 55,83% were menopausal, with an average age at menopause of 49,06 years. In addition, 20,17% of patients had a first-degree family history of breast cancer. Topographically, the right breast was most frequently affected, accounting for 55% of cases. Histologically, infiltrating ductal carcinoma was the most common type, accounting for 89,17% of cases, with 60% classified as grade II according to the SBR classification. In terms of tumour type, 54,78% belonged to luminal group B and 21,74% to luminal group A. Molecular classifications, based on immunohistochemistry results, revealed that the HER2- subtype was the most frequent (73,91%), while hormone receptors were positive in 79,13% of cases for estrogen receptors (RE+) and in 71,30% for progesterone receptors (RP+). The mean proliferation index was 24,15.

Conclusion: In conclusion, our study highlights the different risk factors associated with breast cancer, as well as their correlation with the molecular classification of tumors, which is crucial in guiding therapeutic choices. These results underline the importance of a thorough assessment of risk factors and tumor biology to improve the prevention, diagnosis and treatment of breast cancer.

Keywords: Breast cancer, risk factors , Molecular classification , Retrospective study

Oral mucosal lesions associated with tobacco use: About an epidemiological study

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Abstract

Background Tobacco use affects the surface epithelium, resulting in changes in the appearance of the tissues. The changes may range from an increase in pigmentation to thickening of the epithelium (white lesion. Various types of oral lesions can arise due to tobacco usage in different forms.

This study was aimed to evaluate the presence of oral mucosal lesions associated with tobacco use to promote an early diagnosis, there by aiding in reduction of the associated potential risk of malignant transformation

Methods This is a prospective, observational descriptive epidemiological study

The sample of our population was around 37 patients, who used cigarette and chewing tobacco and had oral lesions, from the end of October 2023 to June 2024.

Our protocol was structured around three steps:

-1st step: patient's motivation and smoking cessation.

-2nd step: oral rehabilitation including teeth scalling, root canal treatment, fixed partial denture and complete denture.

-3rd step: Follow up and monitoring.

Data were entered into the program (data entry) of the Epi Data entry version 3.2 software. -Data cleaning was carried out to identify typos and entry errors. These errors were corrected by referring to the validated sheets. -data exploitation and analysis were carried out with the programs Epi Data analysis and Epi Info 6 [version 6.04 CDC, Atlanta, GA].

Results In our study,25 patients with (67.6%) were cigarette smokers, six patients with (16.2%) chewed tobacco and six patients were mixed smokers

The most common site was: gum with (70.3%), followed by cheek with (56.8%), followed by tongue (32.4 %), and followed by lip with (16.2%).

Conclusion Excessive use of tobacco has been associated with several lesions in the oral cavity. It has been implicated in development of malignant tumors their appropriate management relies on their accurate diagnosis. Considerable overlapping of symptoms produced by these diverse conditions poses significant problems for their diagnosis, which can be resolved only through a thorough knowledge of the clinicopathologic characteristics of each condition

Keywords: Tobacco, Oral mucosa, Differential diagnosis, Lesion

Analytical control of cancer drugs in Algerian pharmaceutical industry

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Abstract:

Background: For the synthesis of cancer drugs, the pharmaceutical industry has used different technologies in addition to chemical synthesis, such as exemplification, fermentation technique, recombinant DNA technique and hybridation technique to obtain new promising active agents such as blood factors, hormones, cytokines, enzymes and monoclonal antibodies. Therefore, the question arises; how can we ensure the safety and efficacy of these drugs?

Methods: This work is a study of the means of control of cancer therapeutic products as listed in the most used pharmacopoeia in Algeria: the United States pharmacopeia and European pharmacopeia.

The drugs have been chosen according to the criteria of been include in the Algerian nomenclature of medical products.

For each product listed for this study a search for its monograph was done to classify them on drugs that can be analyzed with the specification of the reference pharmacopeias and those whom ought to be controlled according to their manufacturer control file or another pharmacopeia.

For those, which have their monograph an evaluation of the methods have been done to establish the most used methods and the frequency of each method also to spot on the differences between each group of products.

Results: For the oldest known products of chemical origin, most of the products have their monographs where there is a homogeneity of the heading covered and the specifications. **Discussion**: The following analytical methods were found: chromatography, spectroscopy and chemical reactions with different frequencies. We can see that the liquid chromatography has a fair share of application for the dosage, the identification, the search for impurities and other specific tests.

The interpretation of the results also shows that the monoclonal products do not have their own monographs, whereas those available for biotechnology products are in the European Pharmacopoeia.

Conclusion: In tune with the fast-paced technological developments and novel challenges, the pharmacopeias are rapidly adapting with the introduction of new, fit-for-purpose technologies and modalities while expanding its scope of covered active substance monographs and pharmaceutical drug products

Keywords: Pharmacy, cancer drugs, control, efficiency.

Study of the Clinical and evolutionary profile of pregnant women with severe preeclampsia

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Abstract

Background: Preeclampsia is a pregnancy complication occurring in the third trimester of pregnancy and specific to human gestation. Our study aims to determine the frequency of preeclampsia in the wilaya of Sidi Bel Abbes at the level of the high-risk pregnancy unit of the gyneco obstetrics department, and to determine the risk factors.

Methods: a retrospective epidemiological study carried out between 2021 and 2023 on a series of 109 pregnant women with preeclampsia aged from 17 to over 40 years by using a well-established questionnaire.

Results: The results obtained show that the average age of the patients was 32.56-+ 6.658, the [25-35] age group was the most representative. The most common family history was high blood pressure (39.8%), and diabetes (30.6%). In our study, (52.8%) had a medical history of high blood pressure, (15.7%) a medical history of diabetes, 6 patients (5.6%) had a medical history of thyroid and 4 (3.7%) medical history of obesity. 24 cases Patients had no family history. More than half of our patients were primiparous with a frequency of 52.8%. 87% of the women included in the study had no maternal complications (87%) while 13% had the HELLP syndrome and oedema. 84.3% of newborns had no fetal complications while prematurity represented (11.08%) followed by fetal death (3.69%), hypotrophy (0.92%). In our study we found that abortion is the most frequently found antecedent (38.6% of cases) and (11.1% of cases) had Eclamptic pre-teeth, and for treatment, Loxen was the antihypertensive the most used with a proportion of 56.88%; Aldomet was used in 53.21% of patients.

Conclusion: Our survey has highlighted the different risk factors for eclampsia ie: age, medical history, family. Better understanding of his disorders could improve the prognosis and management of mother and child.

Keywords : Pregnancy, preeclampsia , history , hypertension

Drug Resistance Profile Of MYCOBACTERIUM TUBERCULOSIS Among Children In ALGERIA

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Abstract:

Background: Tuberculosis remains an important clinical and public health issue worldwide and in North Africa, which has one of the highest tuberculosis burdens in the world**.** Our study aimed to describe the prevalence of drug resistance and the epidemiological situation of tuberculosis in Algerians children under 19, by whole-genome sequencing (WGS).

Methods: In this study, we included new and retreatment tuberculosis cases and 38 strains were isolated. Drug susceptibility testing was performed by 96-well broth microdilution plates, the genomic DNA was extracted and purified; libraries were prepared and run on the Illumina NextSeq500 System. Drug susceptibility testing (DST) was performed using phenotypic and/or genotypic methods.

Results: 38 confirmed TB cases were recovered from patients 3 and 19 years. Five had multidrug-resistant tuberculosis (13, 16%), Twenty-nine had extensively resistant tuberculosis (76, 31%), and three had mono-resistant tuberculosis (7, 89%). Whereas 50% from north of Algeria, 15, 78 % from south, 21% from East and 13, 15% West Algeria.

Conclusion: WGS could provide an accurate prediction of drug susceptibility testing for anti-TB drugs, which are needed for the diagnosis and precise treatment of TB in children.

Keywords: Tuberculosis, MDR-TB, XDR, WGS, Pediatric, Algeria

The role of screening for Dihydropyrimidine Dehydrogenase deficiency in the prevention of 5 Fluorouracil and capecitabine toxicity in the treatment of colorectal cancer

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Abstract:

Background: Dihydropyrimidine Dehydrogenase (DPD) is essential enzyme responsible for metabolizing the fluoropyrimidines, such as 5-fluorouracil (5-FU) and its oral form, capecitabine. These drugs are very frequently used in the treatment of colorectal cancer. Patients with reduced or absent DPD activity are at high risk of developing severe toxicities.

Methods: A prospective descriptive study was conducted in the Medical Oncology Department of the Cancer center of Tlemcen and included the screening for DPD deficiency by phenotyping in patients with colorectal cancer treated with chemotherapy based on 5 fluoro-uracil or capecitabine protocols in the adjuvant and metastatic setting.

Results: We collected thirty two patients. Sex ratio 0.6, the median age was 56 years. Patients were treated with a 5 Fluorouracil or capecitabine regimen, twenty nine patients were treated with capecitabine and three with bolus 5-FU/LV for localized disease in 20 patients (63%) and metastatic in 12 patients (37%). Liver metastases were found in 12 patients. The phenotypic dosage of DPD was carried out in all patients (100%).A partial deficiency was found in 9 patients (28%) motivating a reduction to 2/3 of the doses. Severe toxicities were observed in two patients such as diarrhea and hand foot syndrome which leads us to reduce the dose to 50%.

Conclusion: Screening for dihydropyrimidine dehydrogenase DPD deficiency before administration of 5 fluorouracil or capecitabine must be performed systematically to identify patients at risk of serious toxicities which may lead to the death of the deficient patient and allow dose adjustments or alternative treatments.

Keywords: Dihydropyrimidine Dehydrogenase, 5 Fluorouracil, Capecitabine, colorectal cancer.

A retrospective study of adrenal insufficiency in El-Bayadh region

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Abstract:

Background: Adrenal dysfunction is an endocrine disorder in hormone secretion from the adrenal glands. The primary objective was to determine a percentage of patients with adrenal disorders, and to identify blood biochemical indicators that are most closely related to hormonal imbalance of cortisol, a corticosteroid hormone.

Methods: This retrospective study, conducted between January 2016 and March 2023, involved a cohort of 112 patients recruited from a number of clinical laboratories in El Bayadh region. Serum cortisol and biochemical markers were measured by regular and standard laboratory tests.

Repartition of subjects based on the reference values of serum cortisol. Group 1 exhibited no significant disruption, while groups 2 and 3 consisted of individuals with hypercortisolism and hypocortisolism, respectively.

Results: The statistical analysis indicated that 23.48% of total patients were allocated to groups 2 (14.28%), and 3 (9.82%), whereas the majority, comprising 73.91% were classified within group 1. The mean cortisol level was measured at 320.55 ± 122.18 ng/dl for individuals exhibiting hypersecretion, while those with hyposecretion had an average level of 18.16 ± 15.37 ng/dl. A notable female predominance was observed across all three groups, with a complete absence of male participants in groups two and three. The average age of patients experiencing cortisol disturbances was 36.8 ± 15.79 years, in contrast to an average age of 40.26 ± 17.82 years for patients without any disturbances.

Biological parameters alterations have been observed in patients with adrenal insufficiency. Notably, there is an abnormal elevation in the enzymatic activities of aspartate aminotransferase and alanine aminotransferase, alongside hypersecretion of serum thyroid-stimulating hormone. Conversely, blood glucose, urea, and creatinine remained within normal ranges for this patient cohort.

Conclusion: Adrenal insufficiency is a rare chronic condition that seemed in 9.82% of patients in the current study, a disease that could be associated with blood biochemical variations.

Keywords: Cortisol, hypercortisolism, hypocortisolism, adrenal insufficiency

Alveolar echinococcosis: a case report

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Abstract:

Background: Alveolar echinococcosis is a rare parasitic zoonosis and classically associated with a terrible prognosis because it is determined too late. The objective of our work is to study the radio-clinical aspects and to emphasize the key role of the anatomopathological study in the diagnosis.

Methods: This is a retrospective study of one case of hepatic alveolar echinococcosis collected over a 4 year period from January 2020 to December 2023. The diagnosis is made by histopathological (HE).

Results: We report the case of a 44-year-old woman without particulars who consulted the general surgery department A for abdominal pain with weight loss. An abdomino-pelvic ultrasound objectified a microvesicular appearance in "cluster" and in favor of a hepatic hydatid cyst. A lobectomy was performed with excision of the hydatid cyst.

Macroscopic examination of the specimen shows a cystic formation measuring 08.5/05.5/03.5 cm, addressed open, with a thick wall containing whitish membranes. Histological examination revealed a cystic wall lined with a thick anhistic, lamellar, flaky, eosinophilic layer forming the cuticle. In contact with the latter, we note the presence of a fibrous shell remodeled by a discrete inflammatory lymphoplasmacytic infiltrate with numerous eosinophilic polymorphonuclear cells. This wall is attached to a hepatic parenchyma remodeled by an inflammatory infiltrate mainly lymphoplasmacytic and some eosinophilic polymorphonuclear cells with foci of vascular congestion and edema. Elsewhere, this parenchyma is the site of a chronic granulomatous inflammatory reaction made up of a granuloma consisting of epithelioid cells with some multinucleated giant cells as well as lymphocytes and eosinophilic polymorphonuclear cells. This granuloma is centered by necrosis. The diagnosis retained is that of hepatic echinococcosis accompanied by an epithelial-giantocellular and necrotic granulomatous reaction corresponding to alveolar echinococcosis.

Conclusion: Alveolar echinococcosis is a rare zoonosis due to the intrahepatic development of the larva of the cestode Echinococcus multilocularis. Its diagnosis is based on liver ultrasound supplemented by specific serology. For more unusual clinical forms, punctures or biopsies may then be useful, based on the search for histopathological lesions characteristic of this condition and a molecular diagnosis by PCR.

Keywords: Alveolar echinococcosis, zoonosis, Histological examination

Nasopharyngeal Neuroendocrine Carcinoma: Case report

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Abstract:
Nasopharyngeal involvement of *small-cell neuroendocrine carcinoma* is uncommon. To date, only about twenty cases have been described. This malignancy carries a very poor prognosis. We report the case of a 42-year-old male patient without history, who presented with a gradual nasal obstruction for 03 months, associated with confusion. Craniofacial MRI showed a large nasopharyngeal mass with endocranial extension and bilateral cervical lymph nodes. Nasal endoscopy enabled to visualize the mass located in the right nasopharynx and to perform a biopsy. Histopathology showed morphological evidence of small-cell carcinoma, whose neuroendocrine nature was confirmed by immunostaining: positive chromogranin A and CD56, with a high Ki67 index (80%). CT of thorax, abdomen and pelvis showed no distant metastasis. The tumor was therefore staged as cT4N2M0. The patient had received two cycles of induction chemotherapy using Cisplatin- Etoposide regimen, but his condition rapidly deteriorated due to disease progression, leading to death.
Keywords: Small-cell neuroendocrine carcinoma, Nasopharynx, induction chemotherapy, prognosis.

A rare case of female genital tuberculosis

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Abstract

Introduction: Ovarian tuberculosis is a rare form of female genital tuberculosis, the symptoms are often misleading and can simulate an ovarian tumor.

Patients and Methods: We report the case of a 59-year-old woman with no particulars who consulted the maternity department for pelvic pain. The physical examination objectively showed tenderness of the left iliac fossa with defense to deep palpation. The patient suffered from a total hysterectomy with bilateral exploratory adnexectomy.

Results: The histopathological examination showed an ovarian parenchyma with a chronic inflammatory granulomatous reaction made up of several granulomas of variable size. These granulomas are composed of epithelioid cells, Langhans-type giant cells and lymphocytes. Some granulomas are centered by an eosinophilic, anhist, cracked substance corresponding to caseous necrosis. The diagnosis of ovarian tuberculosis was retained.

Conclusion: Ovarian tuberculosis is a rare form of genital tuberculosis, which can often mimic an ovarian tumor. It is a diagnosis to be considered in the presence of an ovarian mass, especially in endemic countries.

Keywords: tuberculosis, ovary, granulomatous inflammation, histopathological examination

Gastrointestinal stromal tumors

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Introduction: Gastrointestinal stromal tumors represent less than 1% of digestive neoplasias. They are the most common mesenchymal tumors of the digestive tract. They develop in all segments of the digestive tract. They are characterized in immunohistochemistry by an expression of cKit and DOG1 and on the molecular level by activating mutations of tyrosine kinase receptors (cKit and PDGFRA).
The aim of our work is to study the anatomopathological and histo-prognostic characteristics of these tumors.
Materials and Methods: This is a retrospective study of 14 cases of gastrointestinal stromal tumors GIST collected over a 7-year period from January 2011 to December 2018. The diagnosis is made by histopathological analysis and confirmed by an immunohistochemical study.
Results: The average age of our patients is 55.71% with extremes ranging from 19 to 75 years with a slight female predominance, the sex ratio is 0.75. Gastric localization is found in 50% of cases, followed by intestinal localization in 35.71%, colorectal in 7.14% and at the level of the mesentery in 7.14% of cases. The average size of our cases is 14.46 cm with extremes ranging from 4 cm to 35 cm. The histological study was carried out on surgical specimens in 13 cases and on biopsy in only one case. The morphological aspect shows the spindle cell variant in 78.58%, the epithelioid cell variant in 7.14% of cases and the mixed spindle and epithelioid cell variant in 14.28% of cases. The mitotic index of less than 5 mitoses/50 fields at high magnification is found in 53.84%. The immunohistochemical study carried out by the CD117 antibody (cKit) shows positive labeling in 100% of cases. The histoprognostic factors were evaluated by the mitotic index, the size and the location of the tumor according to the Miettinen and Lasota classification with a high risk of recurrence in 7 cases, moderate in 3 cases and low in 3 other cases.
Conclusion: In our series, GISTs are mostly located in the gastric region. We also report an exceptional location in the mesentery with a size of 35 cm. The contribution of immunohistochemistry is a key element in the diagnosis, it allowed us to eliminate other mesenchymal tumors with spindle cells. In only one case, we found a synchronous hepatic, diaphragmatic and parietal metastasis. Diaphragmatic and parietal localization is exceptionally reported in the literature.
Keywords : mesenchymal tumors, cKit, DOG1.

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In Vitro Combinatory Anti-Inflammatory Effect of Ammoides verticillata Essential Oil with Diclofenac

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Abstract

Background: Inflammatory diseases are commonly treated with conventional drugs that often cause side effects, sparking interest in phytotherapy-based solutions. *Ammoides verticillata*, widely recognized in traditional medicine, has been used to treat ailments such as bronchopulmonary diseases, fever, and migraines. However, there is limited research on its potential anti-inflammatory properties.

The aim of this study was to evaluate the anti-inflammatory activity of *Ammoides verticillata* essential oil and its combinatory effect with diclofenac to reduce their minimum effective doses and side effects.

Methods: The essential oil of *Ammoides verticillata* was extracted from plants collected in Ain El Hout, Tlemcen, in May 2022. Its chemical composition was analyzed using Gas Chromatography (GC) and Gas Chromatography-Mass Spectrometry (GC-MS). The anti-inflammatory activity was assessed *in vitro* using the protein denaturation method, with diclofenac as the positive control.

Results: The essential oil exhibited significant anti-inflammatory properties, with 76.9% inhibition at 10 g/L compared to 62.5% for diclofenac. The combination of the essential oil with diclofenac further enhanced the inhibitory effect, achieving 85.6% inhibition at the same concentration.

Conclusion: The findings demonstrate that *Ammoides verticillata* essential oil has promising anti-inflammatory properties and synergizes effectively with diclofenac. These results suggest its potential as a complementary treatment for inflammatory conditions, warranting further investigation.

Keywords: Ammoides verticillata, Essential Oil, Diclofenac.

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Examining the bacterial flora and potential pathogenic risks on the medical staff's telephones in the pediatric-neonatology department of Mecheria, Algeria

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Abstract:

Background: The use of cellphones during medical care is a concern due to the transmission of pathogenic bacteria between medical staff and patients. This habit can lead to treatment errors, resulting in high mortality and additional therapeutic costs. The microbial germs express an infectious impact on patients, particularly children, whose immune system is more often weakened, as well as their loved ones (visitors) and medical personnel. The purpose of this study is to assess the infectious risk associated with the use of cellphones in the pediatric-neonatology department of Mecheria-Algeria.

Methods: Bacteria contaminating cellphone surfaces were isolated in March 2023 using swabs. Their identification was performed in API galleries and antibiotic resistance was analyzed according to EUCAST, (2020). Biofilm formation (O'tool et al., 2010) and hydrophobicity of the bacterial surface as well as the bacterial auto-aggregation (Del Re et al., 2009) capacity were examined simultaneously.

Results: According to the results, the microbial load on the surfaces of cellphones was 35±5 at the minimum and 28 x 104±120 CFU/phone surface (CFU/PS) at the maximum. Gram-positive cocci were the predominant type of these microorganisms. The isolated bacteria were completely resistant to ceftazidime, although they appeared sensitive to ciprofloxazine and tetracycline. In addition to isolates with hydrophobicity greater than 50%, clinical isolates from the pediatric-neonatology department were found to be capable of creating microbial biofilms. Nevertheless, throughout the early incubation periods (T=0 to T=90 min), most strains showed a high potential for auto-aggregation. According to plotting trend lines, only *Micrococcus* and *Pentoea* strains appear to be associated with auto-aggregation, as indicated by the coefficient of determination (R^2) close to 0.9. The other strains examined did not exhibit comparable regression.

Conclusion: According to the statistics from the study, we should raise the alarm against the misuse and uncontrolled use of mobile phones by medical staff in hospital wards. Vigilance is crucial, as evidenced by the high bacterial load found on all surfaces of medical staff members' cell phones and their resistance to several antibiotics.

Keywords: Pediatrics-neonatology, cellphone, bacterial biofilm, resistance, hydrophobicity, auto-aggregation.

Acknowledgment

The authors would like to thank the medical staff of the pediatric-neonatology department for their collaboration.

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Enhancing The Antioxidant Potential Of Date Pits In Diabetic Rats

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Abstract:

Background: In recent years, the seeds of Phoenix dactylifera L (date palm) have attracted growing interest in scientific research and in the food industry. The present study aimed to determine the impact of a diet enriched with date kernel powder on oxidative stress parameters in diabetic Wistar rats.

Methods: The seeds of dates used in this work are of the "Deglet Nour" variety. After the collecte of dates, seeds were soaked in water for one hour. Next, they were cleaned and then dried at room temperature for 10–15 days. Finally, they were ground, using the laboratory crusher, and sieved. The study was conducted in Wistar rats with diabetes on a fructose-enriched diet and the control Wistar rats consuming either the standard diet or a diet enriched with date stone powder. At the end of the experiment, the rats were sacrificed. A blood sample was taken to measure the oxidative and antioxidant markers of oxidative stress. Plasma vitamins A and E were determined by reversed phase HPLC and detected using an UV detector at 292 nm for vitamin E, and 325 nm for vitamin A. Catalase activity was measured by spectrophotometric analysis of the rate of H_2O_2 decomposition at 240 nm. Hydroperoxides were measured by ferrous ion oxidation /xylenol orange assay. Malondialdehyde and reduced glutathione were detected by using kit Sigma.

Results: Our results showed that date kernel powder reduced markers of lipids peroxidation such as hydroperoxides and malondialdehyde in diabetic rats compared to controls. Whereas, plasma vitamin A and E levels, reduced glutathione and catalase activity were increased in diabetic rats compared with controls.

Conclusion: The results indicated that date pits represent a natural and promising source of phenolic compounds that correct the redox imbalance. Date stone powder reduces oxidative stress and correct redox imbalance by reducing oxidants and increasing antioxidants in diabetic rats. Supplementation is therefore recommended.

Key words: Antioxidant impact, Complications, Date pits, Diabete.

Beneficial Role Of Active Biomolecules In Date Pit Powder On Renal Function In Diabetes

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Abstract:

Background: Diabetes is a metabolic disease that is now a major public health problem, manifested by an increase in blood glucose concentration and insulin resistance. This pathology leads to long-term complications that affect organs, such as the kidneys. Date pits are natural by-products that represent a source of bioactive phenolic compounds rich in dietary fiber and antioxidants with therapeutic benefits for health conditions, particularly chronic diseases. The aim of the present study was to evaluate the impact of a diet enriched with date kernel powder on renal biochemical parameters (urea, uric acid and creatinine) in Wistar rats with diabetes on a fructose-enriched diet.

Methods: In this work, the seeds of dates used are of the "Deglet Nour" variety. Diabete was induced in Wistar rats on a fructose-enriched diet. Markers of renal function were measured in plasma. Urea is hydrolysed enzymatically into ammonia and carbon dioxide. Ammonia ions formed reacts with salicylate and hypochlorite to form a green indophenol. Uric acid was determined with enzymatic colorimetric method using biochemical kit spinreact. Plasma creatinine was mesured by using kit cronolab. The assay is based on the reaction of creatinine with sodium picrate as described by Jaffé. Creatinine reacts with alkaline picrate forming a red complex. The intensity of the color formed is proportional to the creatinine concentration in the sample.

Results: Our results showed that plasma urea, uric acid and creatinine were increased in diabetic rats compared to controls.

However, the work showed also that all of this renal markers were decreased in diabetic rats fed a diet rich in date kernel powder.

Conclusion: Date kernel powder supplementation has a positive effect on renal function metabolism during diabetes. It is therefore highly recommended for reducing the incidence of diabetes and its renal complications.

Key words: Creatinine, Date pits, Diabetes, Urea, Uric acid, Wistar rats.

Biofilm formation by Enterobacteriaceae strains isolated from oral cavity

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Abstract:

Background: The oral cavity represents a major environment where bacteria can thrive. Research on colonisation by Enterobacteriaceae, is scarce. Due to the many serious infections they may cause and their ability to form biofilms, Enterobacteriaceae have become a major concern in public health. The aim of this study was to evaluate the ability of oral Enterobacteriaceae strains to form biofilms in vitro.

Methods: Between September 2021 and June 2022, Enterobacteriaceae strains were isolated from the oral cavity of Algerian individuals using sterile swabs. The isolation of strains was based on culture methods, which were subsequently identified using classical tests (oxidase, Gram stain), API and Vitek2. Biofilm formation was determined by the 96-well microtiter plate assay and biofilms biomass was quantified by the crystal violet method.

Results: Our results showed that all tested strains were capable of forming biofilms, with varying degrees of biomass, optical densities ranging from 0, 3 to 0, 4. Notably, the higher biofilm biomass was observed for *Providencia* spp.

Conclusion: Our study showed that species of Enterobacteriaceae isolated from the oral cavity have the capacity to form biofilm. Additionally, the biomass of these biofilms differed between species and also between strains within the same species.

Keywords: Biofilm, Enterobacteriaceae, Oral cavity, Providencia spp

Antimicrobial activity of some Algerian medicinal plants extract against pathogenic microbial strains

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Abstract:

Background: The naturally derived products play an important role as a source of medicine. The development of antibiotic resistances among infectious microbial strains led to the search of new antimicrobial agents mainly among plant extracts. The study aimed to determine the antimicrobial activity of three medicinal plants (*Clematis cirrhosa* L, *Olea europaea* subsp. *laperrinei*, *Rhus pentaphylla*) against some microorganisms pathogenic strains.

Methods: The ethyl acetate and methanolic extracts of *Clematis cirrhosa* L., *Olea europaea* subsp. *laperrinei*, and *Rhus pentaphylla* were tested for their antimicrobial properties using the disc diffusion method. The plant extracts (ethyl acetate and methanol) were prepared through cold maceration. The antimicrobial potential of the prepared extracts was assessed against nine pathogenic bacterial reference strains and one yeast reference strain, *Candida albicans*.

Results: The results indicated that the plant extracts produced inhibition zones ranging from 6.43 to 13.67 mm against one or more of the tested strains. The ethyl acetate extract exhibited antimicrobial activity in most of the tests. The highest antimicrobial potential was observed in the ethyl acetate extract of Olea europaea subsp. laperrinei, which showed inhibition zones of 13.67 mm, 10.47 mm, 8 mm, 11 mm, and 11.17 mm against *Bacillus cereus, Bacillus subtilis, Staphylococcus aureus, Escherichia coli*, and *Proteus mirabilis*, respectively

Conclusion: The experiment demonstrated the effectiveness of the *Olea europaea* subsp. *laperrinei* extract as a natural antimicrobial agent and suggested its potential use in the development of drugs for treating infectious diseases caused by the tested organisms.

Keywords: Methanol extract, Ethyl acetate extract, medicinal plants, antimicrobial activity, inhibition zone

5-amino-salicylic acid protects colonic mitochondria by attenuating oxidative mitochondrial dysfunction in TNBS-induced colitis

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Abstract

Background: Crohn's disease (CD) is a complex, chronic and recurring inflammation of the gastrointestinal tract with unknown etiology. The role of mitochondrial dysfunction in CD is still being investigated. This study evaluated the beneficial effect of 5-aminosalicylic acid (5-ASA), a first-line drug in CD, in trinitrobenzene sulfonic acid (TNBS)-induced oxidative mitochondrial dysfunction, in BALB/c mice.

Methods: Mitochondrial toxicity and redox status were evaluated in colonic mitochondria isolated from TNBS-treated BALB/c mice, 7 days post-colitis induction.

Results: Compared to control, Mitochondria isolated from TNBS-treated mice showed a twofold (2-fold, ***P < 0.001) increase in matrix swelling, associated with elevated lipid peroxidation (mtmalondialdehyde, mtMDA; 3-fold, ***P < 0.001) and superoxide anion generation ($mtO^{\cdot}_2$; up to 4-fold, ***P < 0.001). Concomitantly, aconitase and mitochondrial superoxide dismutase (mtSOD) activities were decreased by 64% (**P <0.01) and 42% (**P < 0.01) respectively. However, 5-ASA attenuated TNBS-oxidative damage in the colonic mucosa. It reduced mtMDA levels (67%; $^{\#\#\#}$P < 0.001), mitochondrial swelling (85%; $^{\#\#\#}$P < 0.001) and $mtO^{\cdot}_2{}^{-}$ (40%; $^{\#\#}$P < 0.01), while restoring mtSOD (3-fold; $^{\#\#\#}$P < 0.001) and aconitase (2.2-fold; $^{\#}$P < 0.05) activities.

Conclusion: Our results suggest that mitochondria may serve as a novel pharmacological target in the treatment and prevention of IBD.

Key words: Crohn disease, oxidative stress, mitochondrial dysfunction, 5-ASA.

Hepatoprotective effect of Phoenix dactylefera against lead acetate sub-acute toxicity

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Abstract

Background Given the widespread presence of heavy metals in food, this study explores potential protective measures against such toxicity, focusing on hepatoprotection, as the liver is a primary target for heavy metal-induced damage.

Methods The study evaluated the preventive and protective effects of date (Phoenix dactylifera L.) extract in countering the toxic effects (sub-acute toxicity) of lead acetate (PbA) through a histological approach using 3 groups of female mice, seven mice each. Lead acetate (100ppm) was administered via intraperitoneal injection, and the date extract was co-administered orally.

Results Histological analysis after lead acetate exposure revealed significant liver damage in the intoxicated mice. However, mice that received both lead acetate and date extract showed a recovery in body weight and improvements in hepatic tissue structure compared to the untreated intoxicated group.

Conclusion The co-administration of date extract and the toxic sources (PbA) demonstrated substantial protective and restorative effects on liver tissue architecture, suggesting a valuable hepatoprotective role for dates, as recognized in traditional medicine. These findings support the potential therapeutic benefits of dates in mitigating heavy metal toxicity.

Keywords: Mice, Liver, Lead Acetate, Protective effect.

Prediction of Pharmacokinetic and Toxicity Properties of Pine Resin

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Abstract:

Background: The genus *Pinus* has its gravity center in Northern Africa, mainly in Algeria where it constitutes the most important massive. The raw pine resin acts as a natural biocide The *in silico* drug likeness filters allow the early preclinical development of drugs by avoiding costly late step preclinical and clinical failure where does the lens come to predict *in silico* pharmacokinetic and toxicity parameters of the Pine resin oleoresin main phytoconstituents widely used in the Algerian traditional pharmacopoeia.

Methods: Resins main compounds were tested using Molinspiration Cheminformatics and SwissADME online tools to predict physicochemical and pharmacokinetic parameters while OSIRIS Property Explorer online tools were used to predict toxicity risks.

Results: The results showed that Abietic, dehydroabietic and neoabietic acids have a low lipophilicity The skin permeability, Kp, values of all compounds ranged from −3.89 to -9.15 cm/s suggesting good skin permeability of the majority of compounds with the exception of Caffeic acid and Vanillin (-6.58 and -6.37 cm/s respectively). The data of *in silico* studies revealed that the toxic and pharmacokinetic characteristics are, mostly, satisfying except for some compounds which have shown toxic effects, in particular Limonene, 4-allylanisole and Vanillin.

Conclusion: We conclude that the extract and its primary phytocompounds can enhance the existing drugs activities without side effects.

Keywords: Pine resin, Pharmacokinetic properties, Toxicity, Phytoconstituents, Lipinski rules, *in silico* prediction.

Evaluation of the anti-inflammatory activity on an animal model of ginger essential oil and its formulated emulsion

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Abstract :

Background: Zingiber officinale, commonly known as ginger, *belongs to the family Zingiberaceae*. This plant consists of several parts, including its rhizomes, which possess various properties such as antimicrobial, anti-inflammatory and antioxidant [1,2]. Many bioactive compounds in ginger have been identified, such as phenolic and terpene compounds. The phenolic compounds are mainly gingerols, shogaols, and paradols, which account for the various bioactivities of ginger.

The aim of the present study is to evaluate the acute toxicity and the anti-inflammatory potential of essential oil of ginger in the mouse paw edema model. Due to its pungent odor and peppery flavor, an Oil-in-water (O/W) emulsion was formulated and tested.

Methods: The acute toxicity of essential oil was evaluated in experimental animals. They were observed for 14 days for mortality and any signs of overt toxicity determination. The measurement of pH of the formulation was done in triplicate and average values were taken. Spread ability and organoleptic properties were evaluated by visual inspection. In vivo anti-inflammatory activity was evaluated by paw edema model using Carrageenan in mousses. NMRI mousses were selected and divided into four groups. Group 1 served as control and was treated with distilled water, while groups 2, 3 and 4 were treated with non-steroidal anti-inflammatory drug (Diclofenac); formulated emulsion and essential oil, respectively.

Results: Our results showed that our essential oil was included in the category of non-toxic substances (no mortality was recorded during the 14 days of treatment). Oil-in-water emulsion was stable with a pH close to that of the oral cavity. Oral administration of ginger essential oil at a dose of 500 mg/kg showed a significant reduction ($p < 0.05$) in carrageenan-induced mouse paw edema compared to diclofenac, the reference anti-inflammatory agent.

Conclusion: These results indicate that the essential oil of the studied plant, as well as the formulated emulsion, possess significant anti-inflammatory properties while being relatively safe to use.

Keywords: Essential oil, Emulsion, anti-inflammatory activity, Ginger, acute toxicity.

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Autoantibodies association to Neuropsychiatric Systemic Lupus Erythematosus

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Abstract:

Background: Neuropsychiatric systemic lupus erythematosus (NPSLE) is a severe lupus complication that affects the nervous system and causes neurological and/or psychiatric symptoms. Autoantibodies, produced during lupus, can form immune complexes responsible for organ damage and a variety of severe complications, including neurological damage. The evaluation of the presence of the autoantibodies in lupus patients' serum will enable us to identify efficient diagnostic markers for disease assessment. The aim of this study was to determine the immunological profile of lupus patients with neuropsychiatric manifestations.

Methods: Our study included 35 lupus patients, 17 with neurolupus (NL+) and 18 without neurological involvement (NL-). Lupus patients were recruited from rheumatology department of Ben-Aknoun hospital in Algiers for a period of 3 years. All patients underwent clinical evaluation to assess their neurologic and neuropsychiatric manifestations. The assessment of autoantibodies: anti-DNA, anti-nuclear antibodies (ANA) and the antiphospholipid antibodies (APL) including the anti-cardiolipin (Acl) and the anti-β2 glycoprotein antibodies was carried out at the serum level using immunofluorescence and ELISA assays.

Results: Our data showed that central neurological damage occurred more frequently than peripheral damage (94% *vs.* 19%). Our findings reveal that the presence of anti-DNA, APL and anti-β2 glycoprotein antibodies was associated with neurological involvement (p=0.0001, p=0.004 and p=0.012, respectively). Anti-DNA, APL, Acl, and anti-β2 glycoprotein antibodies were statistically more frequent in central involvement compared to peripheral involvement (p = 0.0005, p = 0.001, p = 0.04, p = 0.038, respectively). Furthermore, anti-DNA and APL antibodies were associated with the presence of a demyelinating disease in lupus patients (p = 0,006 and p= 0,030, respectively). Finally, we reported that NL (+) patients had more severe clinical activity than NL (-) patients (p<0.0001).

Conclusion: The identification of autoantibodies involved in neurolupus will help to better characterize the disease and identify differential diagnostic markers between lupus patients with and without neurological involvement.

Keywords: Antiphospholipid antibodies, Anti-DNA, Autoantibodies, Neuropsychiatric Systemic Lupus Erythematosus.

Beneficial Effects of Thymus algeriensis Essential Oil on Pathophysiological Alterations Induced by Experimental Cryptococcosis

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Abstract:

Background: Excessive inflammation during respiratory fungal infections poses a significant challenge in disease management, contributing to both the severity of infection and the risk of complications, ultimately increasing patient mortality. *Thymus algeriensis*, a Mediterranean aromatic plant, contains essential oils with promising biological activities. The aim of this study was to investigate the anti-fungal and anti-inflammatory potential of its essential oil in an experimental model of cryptococcosis.

Methods: An experimental study was conducted using a cryptococcosis model induced by intranasal administration of *Cryptococcus sp*. The essential oil of *Thymus algeriensis*, obtained by hydrodistillation, was administered via gavage 72 hours post-infection. Lung samples were collected one week later to assess neutrophil and eosinophil infiltration by measuring myeloperoxidase (MPO) and eosinophil peroxidase (EPO) activities, as well as to determine fungal load. Statistical analysis was performed using one-way ANOVA, and graphs were generated using Prism 8.0.2 software.

Results: The results showed that administration of *Thymus algeriensis* essential oil significantly reduced inflammatory mediators and fungal load. MPO levels were significantly lower ($p < 0.001$), as were EPO levels ($p < 0.01$), compared to untreated samples. Fungal load was also significantly decreased ($p < 0.05$) following treatment.

Conclusion: The essential oil of *Thymus algeriensis* may play a key role in modulating the inflammatory response during fungal infections by controlling its intensity while simultaneously combating the pathogen.

Keywords: *Cryptococcus sp*, Cryptococcosis, Inflammation, Essential oil, *Thymus algeriensis*

Optimizing Immune Responses in Pulmonary Infections via Ion Channel Targeting

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Abstract:

Background: Pulmonary infections pose a significant public health challenge, leading to considerable morbidity and mortality. The interplay between pathogens and the host's immune defenses is crucial, requiring a robust immune-inflammatory response for effective pathogen clearance. The aim of this study was to evaluate the modulation of immune responses by targeting sodium channels expressed on immune cells.

Methods: An experimental model was developed by intranasal administration of nosocomial bacteria to induce pneumonia in animals. A natural sodium channel blocker, purified from scorpion venom, was administered 24 hours post-infection. Blood and lung samples were collected 48 hours post-infection to evaluate C-reactive protein (CRP) levels, the inflammatory mediator myeloperoxidase (MPO), and bacterial load. Statistical analysis was performed using one-way ANOVA, and graphs were generated using Prism 8.0.2 software.

Results: Our results demonstrated that the administration of the natural sodium channel blocker significantly enhanced the immune response, as indicated by an increase in CRP levels ($p > 0.05$) and MPO activity ($p < 0.001$). This amplification led to a notable reduction in bacterial load ($p < 0.05$), reflecting a marked improvement in pathogen clearance.

Conclusion: Prolonged activation of sodium channels during infections modulates the immune response, enhancing the host's defenses and positioning these receptors as novel pharmaceutical targets.

Keywords: Infection, Inflammation, Ion channel

Study of the effect of Echinococcus granulosus on the production of TNF-α induced during Crohn's disease.

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Abstract:

Background:

Echinococcosis is a cosmopolitan zoonosis caused by the larval stage of *Echinococcus granulosus*. endemic in Algeria. According to the hygiene hypothesis, reduced exposure of the immune system during childhood to bacteria and parasites contributes to the onset of chronic inflammatory bowel disease (IBD). A number of studies in this area suggest that helminths could be useful in regulating the immune response associated with chronic inflammatory bowel disease (IBD). In this work, we studied the effect of *Echinococcus granulosus* on the inflammatory response induced in patients with Crohn's disease.

Methods: Peripheral blood mononuclear cells (PBMC) were recovered from the blood of patients with Crohn's disease. These cells were cultured in the presence or absence of protoscolex excretion-secretion products (PES), lamellar membrane extract or hydatid cyst fluid. The *ex-vivo* effect of these extracts on the inflammatory response was assessed by measuring nitric oxide (NO) and TNF-α produced by patients' PBMC.

Results: The results obtained show a reduction in NO and TNF-α production by PBMC cultured in the presence of the products studied.

Conclusion: The results of this study suggest the establishment of a probable anti-inflammatory effect exerted by *E. granulosus* products on the immune response involved in Crohn's disease.

Keywords: *Echinococcus granulosus*, Crohn's disease, TNF-α, nitric oxide (NO).

Contribution of Lactic Acid Bacteria to Health: Antimicrobial and Antioxidant Properties of Algerian Strains Isolated from Fermented Products.

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Abstract:

Background: Lactic acid bacteria, commonly found in traditional fermented foods in Algeria, contribute both distinctive flavors and health benefits. This study aims to isolate lactic acid bacteria strains from fermented figs and "Hamoum" wheat and characterize these strains with a particular focus on their production of bacteriocins and antioxidants. These bioactive compounds help protect against infections and oxidative stress, highlighting their importance in food safety and public health.

Methods: Nine strains were isolated, purified, and initially identified through microscopic and macroscopic examinations, along with a catalase test. Their identity was further confirmed using API50CH galleries. The antimicrobial properties of the isolates were evaluated using the Barefoot and Klaenhammer (1983) method, testing their activity against five pathogens: *Listeria innocua*, *Listeria monocytogenes*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Escherichia coli*. The growth of these pathogens was monitored under different pH conditions and temperatures (4°C, 30°C, 45°C, 80°C, 120°C). To examine the antimicrobial mechanisms, strains H3-1 and F2-1 were treated with proteinase K and trypsin. Furthermore, the antioxidant activity of both strains was assessed through free radical scavenging assays, specifically the DPPH test, to evaluate their ability to neutralize free radicals and reduce oxidative compounds.

Results: The results identified the isolates as *Lactobacillus plantarum* and *Lactobacillus pentosus*. The antimicrobial activity of the strains varied, but both species demonstrated resistance to acidic pH and thermophilic properties, surviving autoclaving at 120°C as well as other tested temperatures. The antimicrobial activity of strains H3-1 and F2-1 was significantly affected by proteinase K and trypsin treatments, confirming that the bacteriocins produced are proteinaceous and belong to class IIa, as they were degraded by these enzymes. Additionally, both strains exhibited strong antioxidant activity, as shown by the DPPH assay results, highlighting their potential as antioxidant agents and suggesting their use as dietary supplements to enhance public health..

Conclusion: The strains of *Lactobacillus plantarum* and *Lactobacillus pentosus* show promising potential as antimicrobial and antioxidant agents, offering interesting perspectives for applications in public health and the prevention of foodborne illnesses.

Keywords: Lactic acid bacteria, *Lactobacillus plantarum, Lactobacillus pentosus*, Antimicrobial activity, Bacteriocins, Antioxidant activity, antioxydants.

The effect of honey bee product on immune functions

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Abstract:

Background: Propolis is a natural product, collected by honeybees, from various plant sources. Propolis is beeswax with rich bioactive compound content, its bioactive Compounds are generally flavonoids and polyphenols, according to its chemical composition, propolis has many biological effects on anti-inflammatory and cellular immunity, wound healing and antioxidant metabolisms.

Methods: Our study aims to assess the in vitro effects of aqueous extract of propolis on the immune function of peripheral blood mononuclear cells (PBMC). Four fresh samples of propolis was collected from four localities of Tlemcen's region (Ain Nefza, Mansourah, Beni Mestar, and Beni Add) in September 2024, Propolis samples were collected using propolis traps directly from previously classified *Apis melifera* honey bee hives. After collecting them, the samples were stored in plastic containers in the freezer and below at temperature (-20) C° to make it solid and able to be ground using an electric grinder to turn it into a powder for the purpose of increasing its surface area exposed to the solvent when preparing extracts, the extract was prepared by dissolving 20 g of powder in 200 ml of distilled water ,blood samples were placed in test tubes The tubes were transferred to the incubator for 30 minutes at a temperature of (37) C° and separate the serum from the rest of the blood components using a centrifuge at a speed of 3000 rpm for 15 minutes. Micropipettes were used to withdraw the serum and keep it in the freezer at a temperature of (-20°C) until the required tests are performed. PBMC were incubated in the absence or presence of propolis aqueous extract and the evaluation of a possible cytotoxicity of propolis was carried out using MTT assay by Elisa technique. Oxidative markers (Malondialdehyde MDA, carbonylated proteins, CARP, Glutathione, GSH, catalase and nitric oxide NO) were investigated after 48-h incubation

Results: Our result showed that ethanolic extract of propolis improved PBMC Proliferation significantly accompanied by the increase in NO it also increased the intracellular GSH and MDA levels in PBMC proliferation potency

Conclusion: propolis has a beneficial effects on immune status during the aging process.

Keywords: Propolis, aqueous extract, proliferation, biological activity.

Acknowledgment:

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Detection of Multidrug-Resistant Bacteria Causing Community-Acquired Urinary Tract Infections in Oran.

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Abstract:

Background: Urinary tract infections are bacterial infections that pose a major public health issue. They are the second most common type of infection after respiratory infections and occur in both community and hospital settings. These infections represent a significant challenge due to the growing issue of multidrug resistance. This study aimed to identify multidrug-resistant bacteria causing community-acquired urinary tract infections in Oran and to evaluate their antibiotic resistance profiles.

Methods: Our study was conducted over two periods: a retrospective study (from January 2019 to December 2021) and a prospective study (from January 2022 to April 2022) at the Pasteur Institute of Algeria, Oran antenna. The collected strains were identified using the API 20 system, and antibiotic resistance levels were evaluated through antibiogram techniques, minimum inhibitory concentration (MIC) testing, and phenotypic tests according to CLSI recommendations.

Results: After analyzing 960 samples, we identified 192 cases of urinary tract infections (20%), with a predominance of females (64%) compared to males (36%). Among the most common pathogens isolated, enterobacteria accounted for 57.29%, with *E. coli* being the most prevalent (64.54%). Non-fermenting Gram-negative bacilli were found in 10.93% of cases, and Staphylococci were detected in 27.60%. Regarding antibiotic resistance phenotypes, various resistance profiles were observed. Among Enterobacteriaceae, we identified the wild-type phenotype in 34.54%, the high-level penicillinase phenotype in 32.72%, the low-level penicillinase phenotype in 18.18%, the Extended-Spectrum Beta-Lactamases (ESBL) phenotype in 10.90%, and the ESBL phenotype associated with a cephalosporinase in 2.72%. For Non-fermenting Gram-negative bacilli, the phenotypes detected included cephalosporinase in 40%, ESBL in 15%, penicillinase in 15%, and ESBL associated with cephalosporinase in 5%. In the *Staphylococcus* genus, the penicillinase phenotype was present in 28.30% of cases and the MRSA phenotype in 16.98%.

Conclusion: Based on the various bacterial profiles identified, our study highlights the increasing significance of antibiotic resistance observed in urban settings. It is crucial to monitor the spread of multidrug-resistant bacteria, given their high prevalence in the community.

Keywords: Urinary tract infection, ECBU, antibiogram, antibiotics, antibiotic susceptibility testing.

Systematic Review: Efficacy, Tolerance, and Adherence of Metformin XR vs. Metformin IR in Managing Type 2 Diabetes Mellitus

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Abstract:

Background: Metformin is an antidiabetic agent recommended as a first-line treatment for the therapeutic management of type 2 diabetes due to its efficacy in controlling HbA1c levels, its low risk of hypoglycemia, low cost, modest effects on weight loss or stabilization, and its ability to reduce both microvascular and macrovascular complications in diabetic patients. However, up to 25% of patients experienced gastrointestinal side effects, leading to treatment discontinuation in 5–10% of cases. Metformin was available in immediate-release (IR) and extended-release (XR) formulations, which were designed to improve tolerability and simplify dosing regimens. The aim of this systematic review was to explore the comparative effectiveness, safety, and impact of these formulations on patient tolerance, adherence, and satisfaction.

Methods: Data for this review were collected from the PubMed and Springer database, focusing on both IR and XR formulations of metformin. The search included studies published between 2004 and 2023, specifically selecting and analyzing ten randomized controlled trials (RCTs), observational studies, and retrospective reviews comparing these two formulations.

Results: Both XR and IR formulations of metformin show the same efficacy in reducing HbA1c. However, the XR form demonstrates better gastrointestinal tolerance compared to the IR form, with simplified daily dosing, which improves patient adherence to treatment.

Conclusion: Based on the results obtained, we can conclude that the use of the XR form of metformin is an effective strategy for managing gastrointestinal side effects, thereby improving overall disease management.

Keywords: Metformin, Diabetes, Efficacy, Adherence, Tolerance.

Bacteria diversity in hard Ticks (Ixodidae) on cattle at the El Braya farm, Oran

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Abstract

Background: Ticks *(Ixodidae*) are ectoparasites, obligatory hematophages of vertebrates. The latter represent a real scourge for the development of livestock and lead to heavy losses in the livestock affected by the many pathogens that they transmit.

Methods: Our study was conducted at a farm located in the town of El Baraya wilaya of Oran from March to May 2022. A total of 28 ticks were collected from 4 infested cattle.A binocular microscope was used for the identification process, and the Meddour-Bouderda and Meddour (2006) identification keys were used to identify the species.The second part concerned research and phenotypic identification of bacteria colonizing ticks. Bacterial identification was made by Gram staining followed by biochemical tests (classic gallery and API gallery).

Results: Our results showed that two species of the *Hyalomma genus: Hyalomma excavatum* (75%) and *Hyalomma lusitanicum* (25%). were visible using a binocular microscope. About the phenotypic finding of tick-borne bacteria, we found 32 phenotypically different bacterial colonies, namely: *Streptococcus equinus* (n=10), *Staphylococcus aureus* (n=9), *Saphylococcus hyicus* (n=6), *Staphylococcus scuiri* (n=4) , *Esherishia coli* (n=2) and *Pseudomonas orizihabitens* (n=1).

Conclusion: To better control tick activity, a treatment based on acaricides should primarily be applied to cattle during the warm season to reduce their population below the dissemination threshold.

Keywords: Bovine, *Hyalomma*, Gram-negative Bacilli, *Staphylococcus, Streptococcus*,

Canal irrigation: The effect of the essential oil of Curcuma longa L on Enteroccocus faecalis and associated Candida albicans

Recurrent endodontic infections

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Abstract

Introduction: Endodontic infection, resulting from the entry of microorganisms into the system through various portals of entry, can result in periapical lesions.
Endodontic treatment largely depends on the effectiveness of root canal irrigation, a crucial step to prevent bacterial resistance of Enterococcus faecalis and Candida albicans during initial endodontic treatment which is responsible for recurrent endodontic infections.

Objective: To evaluate the effect of Curcuma longa L essential oil on Enterococcus faecalis and Candida albicans associated with recurrent endodontic infections.

Material and methods: Establish a minimum inhibitory concentration of the essential oil concentration of Curcuma longa L against a strain of Enterococcus faecalis and Candida albicans using the well microplate technique.

Results: The microwell plate method showed that the essential oil of Curcuma longa L at a concentration of 0.62 mg/mL reduced the growth of Enterococcus faecalis and the growth of Candida albicans.

Conclusion: This study highlighted the possibility of using the essential oil of Curcuma longa L as an irrigation solution during endodontic treatments.

Keywords : Recurrent endodontic infection, Recurrent endodontic infection, Enterococcus faecalis, Candida albicans, essential oil of Curcuma longa L.

Comparison of the effects of conventional (CDMARDs), biological (bDMARDs), and combination therapies on inflammatory and oxidative biomarkers in patients with rheumatoid arthritis.

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Abstract

Background: Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by systemic inflammation and oxidative stress, both of which contribute to the progression of joint damage. Evaluating inflammatory and oxidative biomarkers can provide crucial insights into the effectiveness of treatments and their impact on the inflammatory and oxidative status of patients.
This study aims to compare the impact of conventional (CDMARDs), biologic (bDMARDs), and combination therapies on inflammatory (CRP, ESR) and oxidative stress markers (MDA, NO, GSH, H2O2) in patients with rheumatoid arthritis.

Methods:

Levels of CRP, ESR, MDA, NO, GSH, and H2O2 were measured in patients treated with CDMARDs, bDMARDs, or a combination of both.

Results:

- **CDMARDs vs. bDMARDs:** bDMARDs resulted in a more significant reduction in CRP and ESR levels compared to CDMARDs, demonstrating better control of inflammation. bDMARDs also reduced oxidative stress markers such as MDA and NO while increasing GSH levels, indicating enhanced protection against oxidative stress.
- **Combination of CDMARDs + bDMARDs:** The combination therapy showed the most pronounced effects, with significant reductions in both inflammatory and oxidative biomarkers, including CRP, MDA, and H2O2, along with improved antioxidant status (GSH).

Conclusion: bDMARDs and combination therapies (CDMARDs + bDMARDs) are more effective in regulating inflammation and oxidative stress in patients with rheumatoid arthritis. These findings suggest the importance of a personalized approach in the choice of treatment for these patients.

Keywords: Rheumatoid arthritis, bDMARDs , CDMARDs, inflammation , oxidative stress.

Quantitative Structure-Activity Relationship study of methanolic extract compounds of Ricinus communis based on Computational Screening and Molecular Docking: Antimicrobial and antiviral activities

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Abstract:

Background: Recent studies have demonstrated that methanolic extract compounds from several parts of *Ricinus communis* include Lupeol, and Amyrin, as well as derivatives of Ricinine and Quercetin [1]. However, the pharmacodynamic pathways of these active compounds are less investigated; The present study aims to isolate and identify some constituents of *R. communis* leaves, their analytical characterization, and their in-silico bioactivities against selected bacteria, fungi and coronavirus agents to establish the QSAR model of the main active compounds [2].

Methods: Methanolic extract of *R. communis* leaves was obtained by the conventional maceration process, then, characterized by FTIR-NMR structural elucidation strategy.

The identified compounds were *in-silico* tested against twelve protein receptors of six selected pathogens (*S.aureus*, *E.coli*, *P.aeruginosa*, *S.cerevisiae*, *A.niger*, and SARS-CoV-2). The virtual docking was carried out using SwissDock software after ligand preparation using Chimera.

Results: The structural elucidation allows the identification of Ricinine, Lupeol, alpha-Amyrin, Quercetin (Q), Q-3-O- β- D-glucopyranoside and Q-3-O- β-rutinoside. The binding energies ΔG (kcal/mol) of the various Ligand-Protein complexes range from -5.31 for the Lupeol-6KZV complex of *E.coli* to -11.22 for the Q-3-O- β-rutinoside -4LXJ complex of *S.cerivisea*. For *S.aureus*, ricinin is more active on the 4URM receptor (-6.94), Quercetin is more active on the 3FRA receptor (-8.42) and finally Q-3-O- β- D-glucopyranoside is more active on 3FRA (-9.6). For *S. cerivisea*, lupeol is more active on the P47026 receptor (-8.53), a-Amyrin and Q-3-O-β-rutinoside are more active on the 4LXJ receptor with a ΔG=-8.77 and ΔG= -11.22 respectively.

Conclusion: The six studied compounds are more active, synergically, on *S. aureus* and *S. cerevisiae*; the two QSAR basic models that can be deduced and written as:

$$QSAR_{R.com\text{-}S.aureus} = -6.94[Ric\text{-}4URM] - 8.42[Quer\text{-}3FRA] - 9.6[Quer3O\beta DGP\text{-}3FRA].$$

$$QSAR_{R.com\text{-}S.cerivisea} = -8.53[Lup\text{-}P47026] - 8.77[a\text{-}Amyr\text{-}4LXJ] - 11.22[Quer3O\beta Rut\text{-}4LXJ].$$

Keywords: QSAR, *Ricinus communis*, Methanolic extract, Molecular Docking.

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Enhancement of the Anti-Staphyloccocal Effect of Fluorescent Pseudomonas Strains

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Abstract:

Background: Staphylococci are among persistent bacteria involved in various pathologies and of varying degrees of severity. They are one of the primary agents responsible for nosocomial and community infections. Treatments to eradicate infections are difficult because many strains are multi-resistant. Thus, and in light of the spread of this phenomenon, the discovery of new antibacterial agents as alternative therapeutic strategy has become more than essential.

For the past twenty years, great interest has been shown in rhizobacteria of the genus *Pseudomonas* because of their remarkable ability to inhibit the growth of pathogens.

Methods: As part of this work, two strains of Staphylococcus aureus were collected: one was isolated from the nasal cavity (SI) and another strain isolated from a hospital environment (SH). A study of the anti-staphylococcal effect of some fluorescent Pseudomonas strains was carried out. 26 *Pseudomonas* isolates were selected from three samples of roots of wild grasses. Four isolates were used for the inhibition of Staphylococcus aureus strains by applying the cross-streak method on Mueller Hinton medium and King B medium.

Results: Among the four isolates of *Pseudomonas*, two inhibited the growth of target Staphylococci.

The best performing isolate P21 inhibited both strains of *Staphylococcus* "SI" and "SH" with inhibition zones of 9 mm and 17 mm, respectively.

It has been demonstrated that the production of antibiotics by different strains of *Pseudomonas fluorescens*, *Pseudomonas chlororapis* and *Pseudomonas chlororaphis* subsp. *aureofaciens* is directly linked to this inhibitory power

Conclusion: In conclusion, it can be deduced that *Pseudomonas* strains have an abvious inhibitory capacity against pathogenic germs following the production of a wide range of antagonistic substances. Consequently, it would be interesting to carry out a precise identification of the inhibitory metabolite and also an in-depth study of its action mode.

Key Words: *Staphylococcus aureus*, Infections, *Pseudomonas*, Inhibition.

Potential human health risks associated with ingestion of Cd and Pb through packaged cultured red shrimps (Solenocera *melantho)* and whiting (Merlangius merlangus)

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Abstract

Background: Consumers are confronted with a flood of pre-packaged food products, which are attractive in terms of product presentation. The aim of this study is to investigate the potential health risk associated with the ingestion of heavy metals in packaged shrimps and whiting fillets.

Methods: This study concerns marine red shrimps and whiting consumption. Sixteen samples were collected and then frozen at -15°C for analysis. The samples were dried and reduced to ash in a muffle furnace, then moistened with HNO_3 and placed back in the furnace at 350°C. After filtration, the ash was adjusted to 25ml of a 1% HNO_3 solution. The solution was kept until analysis with a flame atomic absorption spectrophotometer.

Results: The levels of Cd ranged from 0.2 to 0.6 mg/kg DW in shrimp, and from 0.168 to 0.387 mg/kg DW in whiting ($p < 0.005$). The Pb concentration varied from 1.312 to 2.625 mg/kg DW in shrimp, and from 1.25 to 1.75 mg/kg DW in whiting ($p < 0.041$). Cr content fluctuated from 0.2 to 1,937 mg/kg DW in shrimp, and from 1.6 to 3.125 mg/kg DW in whiting ($p < 0.010$) ; Cu concentration ranged from 0.275 to 4.125 mg/kg DW in shrimp ; and from 0.425 to 0.750 mg/kg DW in whiting fillet, ($p < 0.00008$) . The Zn content varied from 7.75 to 13.72 mg/kg DW in shrimp ; and from 2.437 to 3.937 mg/kg DW in whiting fillet ($p < 0.009$).

Conclusion: The results of this study showed worrying high levels of Cd and Pb in both red shrimps and whiting fillets. Prolonged exposure to Cd in humans can lead to kidney damage, bone fragility, reproductive disorders and an increased risk of respiratory system cancer. The ingestion of Pb can cause irreversible disorders (damage to the nervous system, encephalopathy and neuropathy).

Keywords: Flame atomic absorption spectrophotometer – Heavy metals – Cadmium- Lead - Red shrimps - Whiting fillets – Health risks.

Abreviations:

HNO_3 : Nitric acid **–DW:** Dry weight **- Cd:** cadmium – **Pb :** Lead – **Cr :** chromium – **Zn :** zinc

Bioactive Compounds from Passiflora edulis: A Promising Approach Against Alzheimer's Disease

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Abstract

Background Alzheimer's disease is a neurodegenerative condition that leads to the progressive and irreversible degradation of nerve cells, gradually impairing cognitive and memory functions. Medicinal plants are increasingly recognized as a promising source for developing new therapies aimed at slowing the progression of this disease. The seeds of Passiflora edulis, as by-products of the industry, present interesting potential for pharmaceutical applications, with valuable biological activities related to Alzheimer's disease.

Methods The objective of our study was to produce a stilbene-rich extract from Passiflora edulis seeds. We analyzed its content of bioactive compounds through quantitative assays of secondary metabolites, such as flavonoids and tannins, and established its HPLC-DAD-MS profile. Additionally, we evaluated the in vivo anti-Alzheimer activity of this extract using neurological tests focused on the behavior and memory of mice.

Results The results of the phytochemical and HPTLC analyses of the PEAS fraction revealed the presence of secondary metabolites and phenolic compounds associated with the biological activities of the extract. HPLC-MS analysis identified major phenolic compounds, including trans-piceatannol (PE-1), scirpusin B (PE-2), and scirpusin A (PE-3). An improvement in memory and behavioral performance was observed in mice, confirmed by histological studies and immunofluorescence targeting amyloid plaques.

Conclusion These findings suggest that the fractions derived from P. edulis seeds, along with their stilbenes, could represent promising candidates for the development of new treatments for neurodegenerative diseases, particularly Alzheimer's disease.

Keywords: Passiflora edulis, Alzheimer's disease, stilbene, acetylcholinesterase, in vivo, mice.

Antibacterial activity of extracts of Helianthemum apenninum (L.) Mill. and Rochelia disperma (L.f.) K.Koch

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Abstract:

Background: The aim of this study was to evaluate diffusion method for determining the antibacterial activity of plant extracts.

Methods: The different plant extracts were tested against selected gram-positive and gram-negative pathogenic bacteria with the disk diffusion.

Results: The findings showed that the methanol and hydromethanol extracts exhibited varying degrees of antibacterial activity against the tested pathogenic bacteria. Interestingly, *Helianthemum apenninum* showed the highest inhibition against multidrug-resistant bacteria at 10 mg/ml. Ethyl acetate and methanol extracts obtained from *Rochelia disperma* displayed also significant antimicrobial properties against pathogens such as *Citrobacter freundii*, *Pseudomonas aeruginosa*, *Proteus mirabilis* and *Listeria monocytogenes*.

Conclusion: *Helianthemum apenninum* and *Rochelia disperma* extracts had the ability to inhibit bacterial growth. The antibacterial activity differs with the applied extractive method, and it could be partially attributed to phenolic compounds. This study contributes to the knowledge of antibacterial capacity of plants from Algeria.

Keywords: antimicrobial agents, plant extracts, phytochemicals, pathogenic bacteria, *Listeria monocytogenes*

Inhibition of biofilm formation of strains isolated from medical devices by bioactive molecules

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Abstract

Background : Healthcare-associated infections are a major issue affecting millions of patients. They are mainly contracted during medical procedures requiring devices. The formation of biofilm on the surfaces of medical devices shelters bacteria in a protective matrix and is a key factor in the development of these infections. In order to fight these biofilms, new approaches are explored such as the use of nanoparticles biosynthesized by microorganisms.

Methods : Samples were taken from various medical devices used by 25 hospitalized patients in different departments. The bacterial strains obtained were purified and identified using morphological examinations and biochemical tests. The tissue culture plate (TCP) method was employed to evaluate biofilm formation. Nanoparticles were biosynthesized and purified, followed by an assessment of their antimicrobial and antibiofilm activity.

Results: Our results showed that 23 Gram-negative strains were isolated and identified from clinical samples. The analysis of their ability to form biofilm revealed 20 strains highly producing biofilm and one strain moderately producing. Silver and magnesium nanoparticles were biosynthesized by microorganisms. The tests showed remarkable antibacterial and anti-biofilm activity of these nanoparticles against the highest biofilm-producing strain.

Conclusion : These promising results underline the interest of biosynthesized nanoparticles as an alternative treatment against infections associated with bacterial biofilms. This study opens encouraging perspectives in the fight against healthcare-associated infections.

Keywords : Biofilm, Gram- bacteria, Medical devices, bioactive molecules

Antibacterial and anti-biofilm effects of certain plants against strains causing diabetic foot infections.

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Abstract :

Background: Diabetic foot infections are a silent yet severe complication of diabetes, often further exacerbated by biofilm formation. The failure of conventional treatments and the rising costs associated with managing these infections underscore the urgent need for alternative therapies. In this context, phytotherapy is gaining attention due to the diverse therapeutic potential of medicinal plants. This study aims to investigate the antibacterial and anti-biofilm effects of essential oils from *Lavandula stoechas* and *Laurus nobilis* on bacterial strains responsible for diabetic foot infections.

Methods: In this study, 16 strains isolated from chronic diabetic foot wounds in the internal medicine department of the Tlemcen University Hospital (CHU) were tested for their biofilm-forming abilities using the quantitative microplate method (96-well TCP) and for slime production using the qualitative Congo red agar method (RCA). The antimicrobial activity of essential oils from two plants, *Laurus nobilis* and *Lavandula stoechas*, was evaluated using the well diffusion method on Mueller-Hinton agar, and their anti-biofilm activity was assessed using 96-well microplates.

Results: The study of the antimicrobial activity of essential oils from *Lavandula stoechas* and *Laurus nobilis* on strains isolated from diabetic foot infections showed that they are active against the planktonic form of *Staphylococcus aureus*, with inhibition zones exceeding 30 mm. However, strains of the genus *Pseudomonas aeruginosa* were more resistant to these oils. Regarding the biofilm form, the essential oil of *Lavandula stoechas* demonstrated a stronger effect compared to *Laurus nobilis*, with a significant reduction in optical density.

Conclusion: Phytotherapy is gaining increasing interest due to the exceptional antibacterial and anti-biofilm properties of many plants. Therefore, discovering new and effective antimicrobial agents derived from alternative natural resources is of utmost importance, especially in combating resistant bacteria.

Keywords: Infections – Diabetic Foot – Biofilm – Phytotherapy – *Lavandula stoechas* – *Laurus nobilis*.

Influence of phenols, flavonoids, and hydrolyzable tannins from pomegranate (Punica granatum L.) and carob (Ceratonia siliqua L.) peels on wound healing and matrix restructuring

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Abstract :

Background: Medicinal plants provide bioactive compounds with antioxidant and anti-inflammatory properties, essential for wound healing. Natural therapies are cost-effective and accessible. This study examines the wound healing potential of *Punica granatum* L. (pomegranate) and *Ceratonia siliqua* L. (carob). Polyphenols were extracted using solid-liquid (SL) and ultrasound-assisted (US) techniques, with distilled water (DW), 50% ethanol, and deep eutectic solvents (DES) as extraction media. DES, as green alternatives to conventional solvents, were compared to water and ethanol for their efficiency and the bioactivity of extracted polyphenols.

Methods: The extraction was conducted at 50°C for 90 minutes, followed by centrifugation at 21379 x g for 10 minutes. Phenolic, flavonoid, and tannin contents were quantified spectrophotometrically. Antioxidant activity was determined using the DPPH radical scavenging assay, and anti-inflammatory activity was assessed via the bovine serum albumin (BSA) precipitation method. The most effective extracts were incorporated into creams, which were subsequently tested for their effects on skin healing in individuals with burns.

Results: The phenolic content of *Ceratonia siliqua* L. significantly varied with extraction solvents ($p < 0.001$). Distilled water combined with ultrasound-assisted extraction yielded the highest phenolic content (1.011 ± 0.006 g GAE/g DM). Antioxidant activity, indicated by IC_{50} values, showed DES8 as the most effective solvent (IC_{50} = 0.352 ± 0.053 mg/ml), though less potent than ascorbic acid (IC_{50} = 0.117 ± 0.001 mg/ml, $p < 0.0001$). Anti-inflammatory analysis revealed DES3 had the lowest BSA precipitation power, suggesting its ability to mitigate excessive inflammation and foster wound healing. The creams formulated with DES3 and DES8 have effectively treated skin burns.

Conclusion: This study demonstrates the wound-healing potential of *Punica granatum* L. and *Ceratonia siliqua* L. Extracts, enhanced by Deep Eutectic Solvents (DES), showed strong antioxidant and anti-inflammatory effects. When incorporated into creams, these extracts effectively treated burn wounds, offering a natural, cost-effective therapy.

Keywords: *Punica granatum* L., *Ceratonia siliqua* L., Polyphenols, Deep eutectic solvents (DES), Wound healing.

In vitro study of the antioxidant capacity and bioactive compounds of Teucrium polium L. used in traditional treatment of wounds and burns

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Abstract :

Background: *Teucrium polium* L., a Lamiaceae family plant, grows in Mediterranean hills and deserts. Its aerial parts are traditionally used for ailments like abdominal pain, indigestion, diabetes, and burns, attributed to their strong antioxidant properties. This study evaluates the antioxidant capacity and quantifies phenolic, flavonoid, and hydrolyzable tannin contents in *T. polium* from Algeria. Eco-friendly ultrasound-assisted technology (US) with deep eutectic solvents (DES) was employed for extraction, offering a green alternative to traditional solid-liquid methods. The efficiency of these approaches was compared, using distilled water and 50% ethanol as conventional solvents. Results highlight the potential of *T. polium* in therapeutic and antioxidant applications.

Methods: The extraction was conducted at 50°C for 90 minutes, followed by centrifugation at 21379 x g for 10 minutes. Phenolic, flavonoid, and tannin contents were quantified spectrophotometrically. Antioxidant activity was determined using the DPPH radical scavenging assay.

Results: Significant differences ($p < 0.01$) in phenolic, flavonoid, and tannin levels were observed based on the extraction solvent. Maximum phenolic content was achieved with DES5 in solid-liquid extraction (0.979 ± 0.245 g GAE/g DM), while flavonoids peaked with DES6 via ultrasound-assisted extraction (0.186 ± 0.004 g QE/g DM). Hydrolyzable tannins were highest using DES8 in solid-liquid extraction (4.645 ± 2.719 g TAE/g DM). The liquid-solid extraction with distilled water exhibited the strongest antioxidant activity (IC_{50} = 0.505 ± 0.079 mg/ml), but this was significantly lower than that of ascorbic acid (IC_{50} = 0.117 ± 0.001 mg/ml, $p < 0.0001$).

Conclusion: Natural deep eutectic solvents (DES5, DES6, DES8) optimized bioactive compound extraction, while distilled water in solid-liquid extraction provided the highest antioxidant activity, though less than ascorbic acid. These results support the use of green solvents and ultrasound-assisted extraction to enhance medicinal plant applications in pharmaceuticals and nutraceuticals.

Keywords: *Teucrium polium* L., Antioxidants, Deep eutectic solvents (DES), Ultrasound-assisted extraction.

Protein anti-denaturation activity of Rosmarinus Officinalis

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Abstract:

Background: *Rosmarinus officinalis* belongs to the family of Lamiaceae and it is widely spread in different regions of Algeria. Many studies have shown a large set of vertus of this plant but few have interested in its anti-denaturation effect on proteins. The purpose of the present study is the to determine the protein anti-denaturation effect of *Rosmarinus officinalis in* different extracts.

Methods: *Rosmarinus officinalis* has been collected from Tiaret district during the month of April. Then, the plant was dried and grounded to prepare various extracts (aqueous, ethanolic and methanolic). Different concentrations of extracts have been tested on proteins. Ferric Reducing Antioxidant Power Assay (Frap) was also determined.

Results: Our results showed that *Rosmarinus officinalis* extracts have different degrees of proteins anti-denaturation activity.

Conclusion: These results are very promising, prompting us to look for other unevaluated effects of this plant, which is widely distributed throughout Algerian vegetation.

Keywords: *Rosmarinus officinalis*, protein anti-denaturation activity, extracts, FRAP activity, Tiaret.

Conception of Insulin-incorporated Biopolymer Matrix Hydrogels: Application as Preventive Care for Diabetic Foot Ulcers

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Abstract:

Background: The infection of the diabetic foot is defined by the multiplication of microorganisms causing an inflammatory response that goes as far as the destruction of the affected tissues. The consequences of diabetes in feet can be limited by preventive measures such as the release of insulin directly from the feet. In this context, the use of insulin-incorporated hydrogels can overcome some of these obstacles by providing controlled release of insulin and improving its absorption through the skin.

Methods: Different biopolymers were used as excipients for the design of the insulin incorporation matrix. The physical-chemical and rheological properties were determined. The chemical structure of the resulting products was identified by Raman spectroscopy. In vitro transdermal diffusion was studied by Frantz cell. Microbial activity analyses were performed on several bacterial strains.

Results: The results showed that the incorporated biopolymer matrices of insulin present a good spreading coefficient and excellent stability over time. Functional groupings were thus highlighted.

Frantz cell release tests for fast and slow insulins followed zero-order, first-order, and Higuchi and Korsmeyer peppas kinetics.

Microbiological controls showed that the hydrogels were not stable throughout their shelf life and required preservatives.

Conclusion: The hydrogels with polymer matrix incorporated in insulin allow a preventive care adequate for diabetic feet avoiding microbial contamination and consequently ulcers.

Keywords: Diffusion, Insulin, hydrogel, in vitro study, transdermal, microbiological

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Bioactive Hydrogels Based on Nanocurcumin: Towards a New Anti-Inflammatory Approach

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Abstract :

Backgrounds: Chronic inflammation is at the heart of many debilitating diseases, requiring more targeted and effective treatments. Curcumin, a powerful natural anti-inflammatory, is limited by its low bioavailability. In response to this challenge, this project explores the design of nanocurcumine-based hydrogels, aiming at a controlled release of this compound to maximize its anti-inflammatory effect. This innovative approach could revolutionize the treatment of inflammatory diseases, offering a bioactive and adaptable solution.

Methods: The design method for nanocurcumin-based hydrogels begins with the preparation of curcumin nanoparticles, encapsulated in biocompatible polymers to improve their solubility and stability. These nanocurcumins are then incorporated into a polymeric matrix, selected for its hydrophilic properties and ability to form a three-dimensional network capable of inflating and releasing nanoparticles in a controlled manner. The polymerization of the polymer, by chemical or physical methods, allows to form a solid hydrogel while maintaining a homogeneous diffusion of nanocurcumins. Once the hydrogel is formed, controlled release tests are performed in vitro to evaluate the diffusion kinetics of nanocurcumins.

Results: In vitro results showed a significant reduction of pro-inflammatory markers, including TNF-α and IL-6, in cells exposed to nanocurcumin-based hydrogels. After 24 and 48 hours of treatment, levels of these cytokines decreased markedly compared to the untreated control group ($p < 0.05$). This reduction is directly related to the controlled release of nanocurcumins from hydrogel, as confirmed by release tests.

Conclusion: Nanocurcumin-based hydrogels are a promising approach to effectively modulate inflammation, thanks to their ability to release bioactive agents in a controlled manner. The results obtained in vitro show a significant reduction of pro-inflammatory markers, confirming their therapeutic potential. This technology could open the way to new treatment strategies for chronic inflammatory conditions, while improving the bioavailability and efficacy of curcumin.

Keywords: Nanocurcumin, Nanogel, Anti-inflammatory.

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Impact of preservatives on the physico-chemical stability of metronidazole gel

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Abstract:

Background: Rosacea is a chronic inflammatory disease characterized by the occurrence of facial redness, erythema, papules, and pustules and, in severe cases, phymatous changes such as rhinophyma. Treatment depends on severity and mainly includes topical metronidazole**.** The stability of metronidazole gel can be affected by the type of conservative substance. However, this had not been demonstrated in other articles. The study aimed to formulate a metronidazole gel with long stability and to choose an appropriate conservative substance.

Methods: A metronidazole gel was formulated with carbopol 935 and one of the two preservatives Methylparben and acide Éthylène diamine tetra-acetique (EDTA) was added.

Preservatives were used to study their influence on the properties of metronidazole gels at time 0 and after 30 days at room temperature. Gels were controlled by measuring pH, conductivity and infrared spectroscopy.

Results: the monitoring of conductivity over a period of 30 days did not show a significant difference for all gels with $p>0.05$, $p= 0.801$ for gels without preservative, $p = 0.073$ for gels with methylparaben, and $p = 0.57$ for gels with EDTA, this reflects the stability of the preparations over a period of 30 days.

The pH of the preparations was between 4.82 to 5.32 EDTA gels were characterized by a slightly lower pH than preparations containing the active substance with or without methyl paraben. This pH has decreased over time. The most appropriate pH was obtained with methyl paraben. pH monitoring over a period of 30 days did not show a significant difference for gels without preservative and those with methyl paraben with $p>0.05$, ($p=0.546$, $p=1$ respectivily), however gels with EDTA showed a significant difference $p = 0 <0.05$, this may be due to the acidic nature of the molecule EDTA which acidified the gel after its addition. Our results shows that gels of metronidazole with methylparaben were more stable than gels with EDTA.

the spectroscopic profiles shown the presence of two peaks of the same intensity for all metronidazole preparations at t_0(1636,44 cm^{-1}, 3313,07 cm^{-1}) and after storage for 30 days at room temperature (1636,44 cm^{-1}, 3295,84 cm^{-1}) with $p=0,99 >0,05$ for peaks and $p=0,846>0,05$for intensity ,without significant difference.

Conclusion: Methyl paraben is the preservative of choice to maintain the physicochemical stability of metronidazole gels

Keywords: Metronidazole, gel, Methylparaben, EDTA

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Therapeutic Potential of Volatile Terpenoids: Insights into Anti-Inflammatory Mechanisms through Molecular Modeling

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Abstract:

Background: This study investigates the anti-inflammatory potential of selected volatile terpenoids, including carvacrol, thymol, limonene, p-cymene, linalool, and myrcene. These compounds are known for their ability to modulate critical inflammatory pathways, particularly the nuclear factor kappa B (NF-κB) signaling pathway, which regulates the expression of inflammatory cytokines.

Methods: To explore the interactions of these terpenoids with inflammatory targets, molecular docking studies were conducted using the Glide program, focusing on cyclooxygenase-2 (COX-2), cyclooxygenase-1 (COX-1), and IKB-kinase. Molecular dynamics (MD) simulations were performed to evaluate the stability of the compounds in complex with COX-2, and predictions of key pharmacokinetic parameters and toxicity profiles were also undertaken.

Results: The docking studies revealed significant binding affinities for the selected terpenoids, particularly for carvacrol and thymol. Carvacrol exhibited a slightly higher affinity for COX-2 (-7.489 kcal/mol) compared to COX-1 (-6.935 kcal/mol), while thymol showed comparable affinities for both isoforms. MD simulations confirmed the stability of these interactions.

Conclusion: Although the differences in binding affinities are modest, the findings suggest potential avenues for optimizing the selectivity of these terpenoids toward COX-2, highlighting their therapeutic promise in managing inflammatory conditions

Keywords: Volatile terpenoids, Anti-inflammatory effects, Cyclooxygenase-2, IKB-kinase, Molecular docking, Molecular dynamics.

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Biofilm formation in clinical isolates of cephalosporinase-producing Proteus mirabilis

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Abstract

Objective: Infections caused by *Proteus mirabilis* are difficult to treat due to the acquisition of various antibiotic resistance mechanisms. The present work aims to examine the correlation between biofilm formation and antibiotic resistance in clinical isolates of Proteus mirabilis.

Methodology: This is a prospective study spanning a period of three months (June-July-August 2018). The study population is composed of 16 patients hospitalized for 48 hours or more in the intensive care unit. The strains isolated from different samples are purified and then identified by standard microbiological methods.. Sensitivity to antibiotics is determined according to the recommendations of the antibiogram committee of the French Society of Microbiology 2019 (CA-SFM / EUCAST). The sensitivity tests of the isolated strains of *Proteus mirabilis* to imipenem were carried out using the micro-dilution method (CLSI, 2015). The phenotypic demonstration of the presence of an extended-spectrum β-lactamase and a cephalosporinase is carried out by the synergy test (Robin et al., 2012) and the cloxacillin test (EUCAST, 2019), respectively. Thus, this work aimed to test the ability of these strains to form biofilms by the crystal violet technique.

Results: During the study period, Proteus mirabilis represented 9% (n=8) of all isolated germs (86 germs). Antibiogram results for the β-lactam family showed that the strains studied are resistant to ticarcillin/clavulanic acid combinations ; piperacillin/tazobactam as well as piperacillin, cefoxitin, ceftazidime and aztreonam. Resistance to tobramycin and ciprofloxacin concerned all the strains studied. With respect to gentamicin and amikacin, resistance has been
observed in four strains. However, only two strains showed a resistance to the trimethoprim/sulfamethoxasole combination. The intermediate resistance observed to imipenem was confirmed by the evaluation of the MIC levels (2 to 4µg/ml) to this antibiotic. The β-lactam resistance phenotypes were the expression of a cephalosporinase alone or associated with that of a broad-spectrum β-lactamase. For the study of the ability of the strains to form biofilms, the quantification of the biomass carried out revealed that all the strains of Proteus mirabilis isolated have the power to form single-species biofilms and are assigned to the group of highly producing biofilms.

Conclusion: Since most multidrug-resistant, cephalosporinase-producing strains of Proteus mirabilis were highly biofilm-forming, it appears that acquisition of specific antimicrobial resistance can enhance biofilm formation. Proper management of antibiotics is necessary against the spread of multidrug resistance and the appearance of new enzymes.

Key words: *Proteus mirabilis*, Cephalosporinase, Multidrug-resistant, Biofilm.

Screening for Phosphatidylinositol 3-kinase alpha PI3K inhibitors for Anticancer Purposes by Reverse Screening, Molecular Docking and ADMETox Studies

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Abstract

Background: The phosphatidylinositol-3-kinase (PI3K) pathway is one of the most frequently mutated oncogenic pathways in human cancers. The efficacy of PI3K inhibitors is mainly limited by their narrow therapeutic window and frequent treatment-related toxicities. Currently, copanlisib and duvelisib are the only two PI3k inhibitors that have been approved for clinical use. In this poster, we intend to report results of the docking-based virtual screening of molecules similar to natural components of *Pisticia lentiscus* seed oil.

Methods: The PI3K target was predicted by the Netinfer prediction server, as a potential target for a large number of these natural compounds. The most held molecules that were studied are fatty acids, sterols, polyphenols and antioxidants.

Their similars were downloaded from Pubchem. The Glide of Maestro 13.5 prepared them and the docking was done with the MVD for the PI3K target with the pdb code 4L23. The protein was also prepared with the SPDBViewer. The software was validated with this target and the RMSD was 0.28. Similars were filtered by applying Lipinski and Veber rules with the Discovery studio and pharmacokinetic and toxicological properties of hits collected after docking (ADMETOX) were studied with the pkCSM.

Results: After analyzing the docking results by comparing the scores and analyzing the interactions in the active site of PI3K, and studying the ADMETox properties, we can say that the two molecules; Similar to Stigmasterol: 67426622 and 170796 are active on PI3K and can be considered as potential Hits to inhibit the PI3K enzyme.

Conclusion: MD simulations must be applied following initial screening studies because they give a more precise description of the mechanisms and thus provide more reliable and comparable approximations with in vitro experimental results.

Keywords: Docking, Virtual screening, Reverse Screening, PI3K, ADMETox, Stigmasterol

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The impact of the MICA-129 Met/Val polymorphism of the breast cancer

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Background: Polymorphisms in NKG2D ligands (NKG2DL), such as MICA, play a significant role in the context of cancer. MICA is often overexpressed in cancer cells, but variations in the MICA gene can impact the immune response. Certain polymorphisms may reduce the binding affinity between NKG2D and its ligands, allowing cancer cells to evade immune detection more effectively, thereby influencing cancer progression and treatment response.
Methods: The aim of our study was to characterize breast cancer patients and investigate different genetic mutations of MICA. We analyzed 24 samples from patients followed at the EHU of Oran. Genotyping of the MICA-129 Met/Val polymorphism was performed using the PCR-RFLP (Polymerase Chain Reaction - Restriction Fragment Length Polymorphism). The secondary objective was to explore associations between the clinical and biological components of the disease and the identified mutations.
Results: The preliminary results revealed the presence of various genotypes of the MICA-129 Met/Val polymorphism among patients, including the Met/Met, Val/Val, and Met/Val genotypes. A comparative analysis of clinical characteristics showed that patients with the Met/Met genotype exhibited faster disease progression compared to those with the Val/Val and Met/Val genotypes. Additionally, a associations between the MICA-129 genotype status and certain tumor markers, suggesting that the genotype could serve as a prognostic biomarker in breast cancer.
Conclusion: Understanding these polymorphisms may help develop targeted therapies to improve immune recognition and destruction of cancer cells.
Keywords: MICA, MICA-129 Met/Val, polymorphism, breast cancer.

Association of ABCB1 gene c.3435C>T polymorphism with the adverse drug reactions of carbamazepine treatment in epileptic patients.

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Abstract

Background: Epilepsy is a chronic brain disease that affects 70 million people worldwide. In Algeria, about 1% suffer from this disease and are often treated with anti-seizure medications. Carbamazepine is the most prescribed anti-seizure medication due to its affordability and availability. However, one third (1/3) of patients are resistant to antiepileptic drugs, including carbamazepine, and develop serious side effects.

Previous studies have suggested that genetic variations are remarkably associated with reduced bioavailability in epileptic cells, contributing to anticonvulsant resistance and the development of many adverse effects that complicate patients' lives. The Adenosine-Triphoshate-Bending-Cassette-B1 (ABCB1) gene is one of the most studied genes in Carbamazepine pharmacogenetics, it plays an important role in its metabolism. This study aims to evaluate the influence of ABCB1 c.3435 C>T polymorphism on the response to carbamazepine treatment in epileptic patients.

Methods: Twenty-four epileptic patients under Carbamazepine treatment were identified and invited to participate in this study at the neurology department of the University Hospital of Oran (CHUO); the sampling period extended from 2022 to 2024. Clinical data from all patients were collected, then blood samples were taken, followed by DNA extraction by the salting-out method and finally amplification and digestion of exon 26 of the ABCB1 gene by Polymerase-Chain-Reaction Restriction Fragment Length Polymorphism (PCR-RFLP). Statistical analyses were performed using the ANOVA test.

Results: The results suggest that the "T" allele of the ABCB1 c.3435 C>T polymorphism was significantly associated with the side effect "Dry mouth" with a *p-value* = 0.0008* in epileptic patients from western Algeria. However, these results are preliminary and require validation with a larger sample of patients.

Conclusion: The perspective of this study is to propose a pharmacogenetic tool to make the therapeutic choice easier and more effective, leading to a better quality of life for epileptic patients.

Keywords: Carbamazepine, Epilepsy, ABCB1 c.3435C>T, Personalized medicine, Adverse drug reactions.

Association study between single nucleotide polymorphism -159C/T of CD14 gene and allergic asthma in an Algerian population

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Abstract:

Background: Asthma is a chronic inflammatory disease of the airways of the lungs. Genetic factors play an important role in the development of this pathology. The aim of the present work is to study the association between the -159C/T polymorphism of the *CD14* gene and allergic asthma in an Algerian population.

Methods: A case-control study was carried out among 100 asthmatics and 100 healthy controls from the same locality in Algeria. DNA was extracted and processed by the RFLP-PCR technique for genotyping of the -159C/T polymorphism of the *CD14* gene. The statistical analysis was performed using the IBM SPSS software.

Results: The distribution of genotype and allele frequencies of the -159 C/T polymorphism of the CD14 gene showed no statistically significant differences between asthmatic and control groups (X^2=0.872, P_{value} = 0.646; X^2=0.427, P_{value}= 0.514, OR=0.808, 95%CI [0.425-1.534] respectively).

Conclusion: These results may suggest that the -159 C/T polymorphism of the *CD14* gene is not associated with allergic asthma in the Algerian population studied.

Keywords : Algerian population, asthma, *CD14* gene, -159 C/T polymorphism.

Immune Marker Methylation and Its Impact on Breast Cancer Progression

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Abstract:

Background: The role of immune regulation in breast cancer is increasingly recognized. This study investigates the influence of DNA methylation of immune-related genes (PDCD1, CD274, TLR4, TLR9, CTLA4, NFKB1) on breast cancer progression, drawing on data from The Cancer Genome Atlas (TCGA). Our objective is to identify key methylation patterns linked to clinical outcomes and molecular subtypes of breast cancer.

Methods:, We performed a differential methylation analysis of immune-related genes, using data from 531 breast cancer patients recorded in the TCGA database. Methylation levels were correlated with clinical variables, including disease progression and overall survival. Cox proportional hazards models were applied to evaluate the prognostic significance of immune marker methylation.

Results: In this cohort, patients were classified into 5 molecular subtypes (Luminal A, Luminal B, Basal Like, Her2 overexpression, and Normal). Methylation analysis revealed significant associations between immune marker methylation and patient prognosis. Notably, high methylation levels of CTLA4 and PDCD1 were associated with reduced survival, highlighting their potential role in immune evasion mechanisms within tumors. These findings suggest that targeting immune-related genes through demethylating agents or immunotherapy could enhance treatment responses in aggressive breast cancer types.

Conclusion: Our study reveals significant associations between the methylation of immune-related genes and breast cancer outcomes, emphasizing the need for incorporating immune marker profiles into personalized therapeutic approaches. These findings could guide the development of more effective immunotherapy strategies in breast cancer treatment.

Keywords: Breast cancer, immune markers, DNA methylation, prognosis, TCGA database.

Acknowledgment:

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Entrobacter spp : Antibiotic Resistance And Biocide Tolerance

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Abstract:

Background: The hospital environment can constitute a tank of nosocomial pathogens that harbored a significant number of mobile genetic elements, which can contribute to the spread and emergence of resistance genes. This being the consequence of the use of large quantities of antimicrobial agents in hospitals, the objective of this work was to characterize the resistance status of *Enterobacter* strains to antimicrobials by looking for a possible correlation between resistance genes.

Methods: The strains studied were isolated from different surfaces in the operating theatres of three departments (UMC, CHA, TRM). *Enterobacter* isolates were identified by 16S rDNA sequencing. Tolerance to biocides was determined by the microdilution technique and resistance to antibiotics by disk diffusion.

The genetic determinants of antimicrobial resistance were studied by polymerase chaine reaction using the appropriate primers. The genes coding for the active efflux pump sought were mdfA and oqxA, and OqxAB. For resistance to β-lactams : blaTEM, blaPSE, blaCTX-M and blaCTX-M-2, blaNDM-1, blaIMP, blaOXA-23 and blaVIM-2.

The other genetic determinants studied were the following : tet B, tet C and tet D ; aac (6)-Ib; aadA, floR, dfrA12 and dfrA15; sul1, sul2 and sul3. And the genes qacA/B, qacH, qacΔ1, for biocides.

Results: Two species of Enterobacter were found : *E. cloacae* and *E. hormaechei*. Resistance to antibiotics have concerned mainly ß-lactams. Biocide tolerance levels were high for hexachlorophene and benzalkonium chloride. Extended-spectrum beta-lactamase genes were detected in 44.2%. Other frequently detected antimicrobial resistance genes were aac (6') –Ib and sul2.

A correlation between the presence of biocide tolerance genes and antibiotic resistance genes was detected, it was described as weak in some cases between *qac* genes and *bla* genes and weakly positive between *qacA/B* gene and *sul2*, *sul3*, *tet B*, *tet D*, *aadA* and *drfA12* genes.

Conclusion : This work reveals a worrying tolerance to biocides in *Enterobacter* strains. Biocide tolerance could be one of the factors of co-selection of antibiotic resistance and persistence of antibiotic-resistant strains in hospital settings. The results highlight the need to establish new strategies and explore other alternatives, including new formulations, to combat these bacteria on surface before they reach patients.

Keywords: Enterobacter spp, Antibiotics, Biocides, Resistance, Hospital.

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Knowledge and Attitudes of Medical Students towards Plagiarism: A Cross-Sectional Study in Northwest Algeria

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Abstract :

Background: Plagiarism is a serious offense in academia, particularly in medical education, where honesty in research, accurate reporting of findings, and proper citation practices are essential for maintaining public trust and ensuring the validity of medical knowledge. This study aimed to assess the knowledge and attitudes of medical students toward plagiarism in Northwest Algeria.

Methods: A cross-sectional study was conducted in Medical Sciences faculty, Abou Bekr Belkaid University, Algeria, from March 2024 to June 2024 using a convenience sampling method and a questionnaire that collected information on the participant's social-demographic characteristics, knowledge about plagiarism, and measuring their three attitudinal factors (positive and negative attitude and subjective norms) toward plagiarism.

Results: A total of 270 undergraduate and postgraduate medical students participated in the study. The data show a predominantly female sample. A total of 67.4% of participants had a moderate understanding of plagiarism (knowledge score between 5 and 8 of 10). In addition, the results revealed a moderate positive attitude (38.79 ± 6.144), negative attitude (23.97 ± 3.093), and subjective norms (29.91 ± 5.609) toward plagiarism. The moderate scores obtained in all three categories revealed confusion, lack of a clear attitude, and, most worryingly, a lack of knowledge and awareness of the importance of academic integrity.

Conclusion: This study provides valuable insights into the attitudes of medical students toward plagiarism in Northwest Algeria. The findings highlight the need for educational interventions that enhance students' understanding of plagiarism and promote ethical academic practices.

Keywords: Plagiarism, Medical students, Knowledge, Attitudes, Northwest Algeria

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Prevalence and Distribution Patterns of Head Lice (Pediculus humanus capitis) Among School-children in Algeria.

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Abstract:
Background: Head lice infestation, or pediculosis, caused by *Pediculus humanus capitis*, is a widespread public health concern, particularly in developing countries [1]. These ectoparasites thrive on the human scalp [2], feeding on blood every three to six hours and surviving up to four weeks on their host [3-5]. Although, head lice can affect individuals of any age, gender, or ethnicity [3]. This study, conducted from September 2015 to May 2024, focused on primary school children in Algeria, aiming to evaluate prevalence and assess the influence of age, gender, and hair type.
Methods: The study was conducted in 21 wilayas, with four schools sampled from each. Schoolchildren were randomly selected and examined. An information sheet was completed for each child, collecting details such as age, gender, and the number of founded lice. Each child's hair was inspected visually, with gloves worn for hygiene purposes. The diagnosis of pediculosis was confirmed by the presence of nits, larvae, or adult lice, identified using Pajot's (2000) dichotomous key [6]. Prevalence (P) was calculated using Margolis et al.'s (1982) method [7]. Statistical analyses were performed using Python software.
Results: The study thoroughly examined 31,825 primary school children, revealing an overall prevalence of 0.33 %, with 1,074 confirmed cases. Preliminary findings offer insights into infestation trends across demographic factors. The highest prevalence was recorded in Boumerdes (17.75 %) among children aged between 6 to 10 years, while the lowest was observed in Bejaia (1.06 %). Girls had a significantly higher infestation rate (4.81 %) than boys (1.36 %). Children with straight hair showed higher prevalence rates (3.70 % for girls and 1.36% for boys) compared to those with curly hair.
Conclusion: Head lice infestation is endemic in Algeria, posing a significant public health challenge, particularly in child communities. These findings are expected to enhance the understanding of pediculosis and contribute to more effective public health strategies.
Keywords: *Pediculus humanus capitis*, Algeria, Prevalence, Primary School Children.
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