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ICHSM'T’21 is the fifth version of the International Congress of Health Sciences and Medical Technologies. The congress attended the success of regrouping a multidisciplinary community working with the challenge to add a relevant increment to the medical innovation and findings.

The congress is a successor of four successful versions established respectively in 2016 (at Tlemcen University Algeria), 2017 (at Mariott Hotel Tlemcen Algeria), 2018 (at CERIST Algiers Algeria), and 2019 (at Zianides Hotel Tlemcen Algeria). After several delay and for the first time, an online edition was established due to critical situation of worldwide pandemic, which make the end of millions of peoples life. The congress is held between 27 and 29 June 2021, only online but the organization was at Tlemcen.

The congress at that edition attracted researchers from several nations and specialties naming: Algeria, Germany, Iran, Switzerland, Netherland, Denmark, Malaysia, China, Portugal, Bulgaria, Pakistan, France, Morocco, Tunisia, Brazil, United Kingdom, Egypt, India, Poland Iraq, and Kingdom of Saudi Arabia. The congress author’s affiliations were from several departments such as medicine, biology, physics, chemical sciences, computer science, environment, pharmacy, dentary surgery, electrical and electronic engineering, and mechanical engineering.

The content was selected via strong criteria applied by the members of program committee. We received 63 submissions, which were reviewed by 2-3 reviewers, and we accepted 59, the rate of acceptance was 80.95%. Only some abstracts are selected for publication in this book.

The submission was categorized in three conferences and one workshop according to the major dependency of the contribution.

- International conference on Medical Technologies 2021
- International conference on preclinical and basic sciences 2021
- International Conference on Cancer and Public Health 2021
- Genetic Items Workshop 2021

We are so proud to acknowledge all contributor to the establishment of this congress namely:

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Dr Abdeldjalil Khelassi
The chair of ICHSMT’21
Tlemcen, June 2021.
Epidemiological clinical histopathological and therapeutic profile of Kidney cancer in Algeria

Ahmed Amin Saib .MD\textsuperscript{1,2}, Ilhem Lahfa .MD\textsuperscript{1,2}, Somiya Ghomari .MD\textsuperscript{1,2}

\textsuperscript{1}Department of medical oncology, university hospital center of Tlemcen, Algeria.
\textsuperscript{2}Medical faculty, university of Abou Bekr Belkaid, Tlemcen, Algeria.

Saib.amine@hotmail.com

Abstract

Background: Kidney cancer is relatively rare, represents 3\% of all malignant tumors in adults, and is the third urological cancer after the prostate and bladder (13th location of cancer in the world); it appears at an age advanced, common especially in humans. The objective of this study is to establish the epidemiological, clinical, histopathological, and therapeutic profiles of kidney cancer in this population.

Materials and methods: We conducted a retrospective study on patient’s files treated at the Medical Oncology department of the CHU of Tlemcen (Algeria) for renal cancer from January 2015 to December 2019.

Results: Sex ratio (M / F) is 2. The average age is 56 years. Notion of smoking exists in (52\%) of patients, obesity (33\%), and hypertension (62\%). Hematuria and low back pain represents the main reasons for consultation respectively: (48\% and 62\%). The disease diagnosed mainly at a metastatic stage (62\%). The most frequent histological type is clear cell carcinoma (71\%). Treatment based on: surgery in (81\%) of patients, targeted therapy (38\%), and palliative radiotherapy (10\%).

Conclusion: Kidney cancer is a frequent localization in humans exposed to several risk factors, which manifests itself by several symptoms, is mainly treated by surgery, requiring postoperative monitoring by CT scan in patients at risk of metastasis, in whom Targeted therapy has shown its effectiveness, along with other promising studies in court.

Keywords: kidney, metastases, targeted therapy.
Use of inferential statistics to investigate the correlation between Helicobacter pylori infection and the presence of precancerous lesions in patients with chronic gastritis

BENAKLI Yasmina, HOUALI Karim

Laboratory of Analytical Biochemistry and Biotechnology (LABAB) University Mouloud Mammeri Tizi Ouzou (UMMTO)

Abstract

Background: The course of gastric carcinogenesis, long studied, has been established to follow certain tissue changes. The majority of individuals develop only gastritis, often caused by Helicobacter pylori infection, some progress, in chronological order, to gastric atrophy, metaplasia, dysplasia and finally, to gastric cancer. We are particularly interested in these pre-cancerous lesions (PCL), metaplasia, and dysplasia in the gastric tissue.

Methods: For this purpose, a study was conducted on 809 patients, all initially recruited at the Nedir Mohammed Hospital in Tizi Ouzou, after which these tissue changes and H.pylori infection were recorded by histological and immunohistochemical (IHC) studies on gastric biopsies.

Results: Different subpopulations were identified. Their evolution by application of inferential statistics, for the study of trend curves, allows noting a tendency to the decrease of the numbers of the various subpopulations over the years. In particular, the H.pylori + subpopulation (presence of the bacteria in the gastric mucosa) with evidence of pre-cancerous lesions, having a correlation coefficient $R^2 = 0.94$, while the H.pylori - subpopulation with evidence of pre-cancerous lesions, presents a correlation coefficient $R^2 = 0.19$.

Conclusion: In these early stages of gastric carcinogenesis, it is likely that other factors contribute to the development of these lesions. Further studies are essential to better clarify the probable decrease in the association between bacterial infection and these tissue disturbance.

Keywords: chronic gastritis, Helicobacter pylori, correlation, trend line, intestinal metaplasia, dysplasia.
Clinical and radiological evaluation of the treatment of chronic apical periodontitis in one session versus multiple visits: double-blind randomized clinical trials

Nawel ALLAL1, Latéfa HENAOUI2, Hafeda BOUCHNAKI1, Radjaa BOUBEKER1, Meriem BOUBASSELA1, F. OUDGHIRI1, D. BOUZIANE3

1: Conservative dentistry service endodontics Tlemcen University Hospital Center, Algeria
2: Department of epidemiology and preventive medicine Tlemcen University Hospital Center, Algeria
3: Oran University Hospital Center Periodontology Department. Algeria

Abstract

Background: Of the frequent lesions that doctors-dentists are daily treated, periapical lesions. Most studies of apical periodontitis emphasize their very high prevalence, which increases with age. Knowledge of this apical periodontitis and its risk factors will facilitate the definition of strategies to improve the management in terms of prevention and treatment of these pathologies. Clinically and radiologically, evaluate the apical healing rate of chronic apical periodontitis after endodontic treatment in one or more visits using Ca (OH) 2.

Methods: A total of 20 consenting patients with chronic apical periodontitis on monoradiculates were randomly assigned to 2 groups: the first group was endodontically treated in several sessions with Ca (OH) 2 and the second group was treated in a single session. In both groups, the root canals were prepared with the protaper system and sodium hypochlorite as an irrigant, the ductal obturation was made with the cold lateral condensation of the gutta percha. The periapical index has been used to radiologically evaluate periapical regression over a 6-month post-therapeutic period the various periapical states since the beginning of treatment over a period of 06 months.

Results: The clinical evaluation of the whole sample after 6 months shows the disappearance and absence of any clinical signs of chronic apical periodontitis in 95% of cases without significant difference between the two groups compared.

Radiologically three categories of patient were observed after the controls:
- Regression by a stage in 65% of cases;
- Regression by two stages in 20%
- 15% did not have a regression.

The clinical and radiological evaluation of our sample after an average period of 6 months showed no statistically significant difference in the results between the two groups compared with a Chi2 of 0.30 and 0.49.

Conclusion: The inter-visits medication based on calcium hydroxide did not influence the scarring process of periapical lesions. It seems that respect for the triad: shaping, irrigation, and the three-dimensional sealing of the canal system is the cornerstone of success of any endodontic treatment that always aims to transform a pathological tooth into a healthy and functional entity. The treatment in a single visit is much more interesting to avoid a microbial seeding in intersectance and to decrease the duration of the treatment when the sealing is possible.

Keywords: chronic apical periodontitis; the calcium hydroxids; one visit; several visits; healing
Pedigrees of Families Affected by Familial Forms of Parkinson's disease in Eastern Algeria

Razika Gharzouli, Amina Iness Bernou, Ouissem Benarab, Dalila Satta
Laboratory of Molecular and Cellular Biology, Faculty of Biology, University of Mentouri Constantine 1, Constantine, Algeria.
rgharzouli@umc.edu.dz

Abstract

Background: Parkinson's disease (PD) is the second most common neurodegenerative disease, characterized by the destruction of dopaminergic neurons. It is a multifactorial disease: resulting from a gene-environment interaction, of which about 10% of cases represent familial forms. This study aimed to determine modes of transmission of (PD) and its heredity in a population of eastern Algeria.

Methods: We realised a descriptive study during the period February-June 2018, in which we collected a population of 150 treating patients at the level of the polyclinic of Sissaoui - Constantine, and of the neurological office of Dr Alliouech. In order to highlight the part of heredity in the onset of (PD) and its modes of transmission, we have traced the family history of patients with family affected members in eastern Algeria.

Results: Our results showed that from 150 (PD) patients, 33 patients have at least one family member affected by the Parkinson's disease, which represents 22% of our population; some of the patients with a family history have two or three parents affected by (PD). Family members affected with the same pathology as Parkinson’s patients could be first, second or third degree relatives. Family pedigrees were made according to the availability of data for 16 families. Pedigrees of these families have shown that the transmission of this neuropathy occurs in two autosomal modes: dominant and recessive.

Conclusion: In the familial forms of the Parkinson’s patients of this study, there are cases with autosomal dominant forms and others with autosomal recessive forms. In order to highlight the implication of the mutations in the occurrence of the (PD) for both modes of transmission, a more in-depth study with a molecular analysis is necessary.

Keywords: Parkinson's disease, Familial forms, Pedigrees, Heredity, Mode of Transmission.
Study of the resistance profile of several germs isolated from different samples from community infections in a medical analysis laboratory in Oum El Bouaghi

RAHMANI Amina*, MERADI Laarem

1Département of natural and life sciences- Laboratory of Biotechnology of natural substances and applications- Larbi Ben M’hidi University in Oum El Bouaghi
aminarahmani311@gmail.com

Abstract

Background: The number of infections caused by resistant bacteria is increasing worldwide, and the specter of untreatable community infections is becoming a reality in Algeria, self-medication and the high consumption of antibiotics and sometimes-inappropriate prescriptions favor the emergence of resistant bacterial strains.

Method: The aim of this study is to analyze different samples (vaginal swab, mammary swab, coproculture, pus, and sperm culture) in several patients and to study the antibiotic resistance profile of the germs obtained at a medical analysis laboratory in Oum El Bouaghi. The identification of the strains was performed by classical microbiology methods and the confirmation of each species by the API specific to each bacterial genus and the disc diffusion method was used to perform the Mueller-Hinton agar susceptibility test according to NCCLS (National Committee of Clinical Laboratory Standards, 2019).

Result: The results obtained show that Staphylococcus aureus, coagulase-negative Staphylococcus, Klebsiella pneumoniae, Klebsiella oxytoca, Escherichia coli, Proteus mirabilis, Salmonella enterica and non-hemolytic Streptococcus beta are the most isolated germs of community infections, and all of them present resistance to almost all antibiotics used, these observations are really alarming.

Conclusion: The use of these drugs in humans is necessary to preserve the efficacy of antibiotics.

Keywords: antibiotic resistance, community infections, germs, samples.
Immunophenotyping of lymphoproliferative syndromes in leukemic conversion
BENAKLI Yasmina, HOUALI Karim

Laboratory of Analytical Biochemistry and Biotechnology (LABAB) University Mouloud Mammeri Tizi Ouzou (UMMTO)
benakli.yasmina@yahoo.com

Abstract

Background: The term chronic lymphoproliferative syndromes (CLPS) with blood dissemination refers to all clonal proliferations that affect mature cells of the B, T and even NK lymphoid lineages. This definition applies to leukemic forms proper (B chronic lymphocytic leukemia, tricholeukocyte leukemia …) as well as to leukemic forms of lymphomas such as follicular lymphoma, mantle lymphoma, lymphoma,

Method: The objective of this study is to show the interest of immunophenotyping by flow cytometry in the differential diagnosis between leukemic CLPS and CLPS in leukemic conversion. Initially, these entities were classified after cytological analysis as B-CLL.

Results: Immunophenotyping of lymphoma cells of these patients with flow cytometry confirmed that they are lymphomas in blood dissemination phase.

Conclusion: This diagnostic confusion has been raised by several works, which allowed Matutes’s team to establish a score based on the immunological profile of the tumor lymphocytes

Keywords: leukemia, lymphoma, leukemic conversion, flow cytometry.
Involvement of the -75G / A polymorphism of apolipoprotein A1 in coronary atherosclerosis

Ouarda Semmame 1 Dalila Satta 1, Noreddine Abadi 2

1. Department of Animal Biology, Faculty of Life and Natural Sciences, Molecular and Cellular Biology Laboratory, University of Constantine 1, Constantine, Algeria,
2. Department of Biochemistry, Ben Badis University Hospital, Biology and Genetics Research Laboratory, Faculty of Medicine, University of Constantine 3, Constantine, Algeria,
semmame.ouarda@gmail.com

Abstract

Background: Atherosclerosis, the main cause of myocardial infarction, is a multifactorial disorder that involves environmental and genetic risk factors. In coronary atherosclerosis, there are many genes whose products are involved in the development of the disease and for which a genetic polymorphism has been described. The objective of this study was to assess the effect of the -75G/A polymorphism of the apolipoprotein A1 gene (Apo A1) on the risk of myocardial infarction.

Methods: Our case-control study included 319 subjects who received a full lipid profile (TC, TG, HDL, LDL). The study population was divided into two groups: control group (160 apparently healthy subjects) and patient group (159 subjects with myocardial infarction). Genotyping of the Apo A1 polymorphism was done by a PCR/RFLP using the restriction enzyme Mspl.

Results: Our results show that the mutated genotype AA of Apo A1 is not significantly associated with the risk of MI (OR = 0.74, 95% CI 0.27-2.008). However, carriers of the genotype AA, either in control or in patients, have higher serum levels of HDL.

Conclusion: In conclusion, individuals with the AA genotype appear to be likely to have a lower risk of myocardial infarction as a result of its effect on higher serum concentrations of HDL. Additional studies are needed to confirm this finding.

Keywords: myocardial infarction, atherosclerosis, lipid, apolipoprotein A1, gene polymorphi
No association between the insertion/deletion polymorphism of the angiotensin-converting enzyme gene and Alzheimer’s disease in Algerian population


1. Laboratory of Molecular and Cell Biology, Department of Animal Biology, Faculty of Natural and Life Science, University Of Mentouri, Constantine, 25000, Algeria.

2. Department of Neurology, Ben Badis Constantine University Hospital, Laboratory of Biology and Molecular Genetics, Salah Boubnider University, Constantine, 25000, Algeria.

3. Department of Neurosurgery, Regional Military Hospital of Constantine, Constantine, 25000, Algeria.

4. Laboratory of Biology and Molecular Genetics, Faculty of Medicine, University Of Constantine 3, Constantine, 25000, Algeria. 

rayene.achou@gmail.com

Abstract

Background: Alzheimer's disease (AD) is the most common neurodegenerative disease. Angiotensin-converting enzyme (ACE) present an altered activity in patients with neurologic diseases and many studies proposed an association of the insertion/deletion (I/D or indel) polymorphism of ACE with AD. The aim of this study was to investigate whether an angiotensin-converting enzyme is associated with the risk of Alzheimer’s disease in Algerian patients.

Methods: We conducted case-control study included 40 patients diagnosed as having AD at the University Hospital Center Ben Badis Constantine and 75 healthy individuals as controls. All subjects were genotyped for ACE I/D polymorphism with the PCR method.

Results: Our results showed that no significant association was observed between ACE ID gene polymorphism and AD. The genotype frequencies were: ID (22.50%, 26.67%), DD (67.50%, 72%) and II (10%, 1.33%) in case and control groups respectively. The ACE I and D allele frequencies were: I (17%, 22%) and D (78.75%, 85.33%) in case and control group respectively. There was no statistically significant association between the ACE ID polymorphism and AD in Algerian population.

Conclusion: The results showed that there was no significant association between the ACE ID gene polymorphism and AD in Algerian population.

Keywords: Alzheimer's disease (AD), Angiotensin Converting Enzyme Gene (ACE), Polymerase Chain Reaction (PCR), Polymorphism.
Comparison between TGFBR1 gene polymorphism and the risk of hypospadias in an Algerian population and Chinese population

Rania Laouar 1, Djalila Rezgoune-Chellat 1, Souhem Touabti 2, Karima Sifi 3, Noureddine Abadi 3, Dalila Satta 1.

1 Laboratory of Biology and Molecular Genetics, Department of Animal Biology, Faculty of Natural and Life Science, University Of Mentouri, Constantine, 25000, Algeria.
2 Pediatric Surgery Department Specialized Mother and Child Hospital –El Eulma–, Setif, 19000, Algeria.
3 Laboratory of Biology and Molecular Genetics, Faculty of Medicine, University Constantine 3, Constantine, 25000, Algeria.

laouar.rania2017@gmail.com

Abstract

Background: Hypospadias is the most common external male genital malformation, affecting 1/125 to 1/300 live male births. Hypospadias is defined as the abnormal closure of the genital folds results in a urethral meatus on the ventral surface of the genital tubercle. Gene expression in TGF-β and Wnt-Frizzled pathways has been found to be involved in the development of genital tubercle and urethral tube. The roles of TGFBR1 gene polymorphisms in hypospadias have been recorded only in a Chinese population. The aim of this study is to investigate the relationship between TGFBR1 gene polymorphism in the Algerian population and compare our results with those of the Chinese population.

Methods: 47 patients with different degrees of hypospadias operated at the pediatric surgery department specialized mother and child –El Eulma– were genotyped for TGFBR1 gene polymorphism with PCR-RFLP method. Baseline characteristics of the population were described; genotype distribution and allele frequency were analyzed.

Results: Patients were from 11 different cities of eastern Algeria. The middle age was 4.09 ±2.86 years. 25 of a 47 patients have associated anomalies. The TG genotype and the G allele were the most frequent (44.68% and 51.88% respectively), GG genotype was frequent in patients with posterior hypospadias.

Conclusion: Our results are similar to those of the Chinese population. The study of the polymorphism of the TGFBR2 gene in our population is one of our perspectives by comparing them with controls.

Keywords: Hypospadias, TGFBR1, PCR-RFLP, Polymorphism.
Interest of lasers in Endodontics
Somia Amrani ; Fouad Oudghiri ;Nawal Allal
amranii2016@gmail.com

Abstract

Background: Laser technology is a technique that has proven itself in endodontics and it is very studied for its antimicrobial and analgesic activity. We will propose a review of the literature, the objective of which is to understand the interest of different types of laser used in endodontics.

Methods: The search strategy was an electronic search on PubMed including the trials randomized clinics treating the use of different types of lasers in endodontics, published in English between 2016 and 2021.

Results: We obtained a total of 31 articles, as a result of reading the titles, abstracts, or full article, 10 were eliminated, 21 articles were retained for our work.

Conclusion: Based on our research on lasers in endodontics, it appears that lasers have provided effective results in root canal disinfection, in particular the elimination of E. Faecalis of the root canal thus in the reduction of post-operative pain.

Keywords: laser, endodontics, interest
In Vitro- The Photodynamic Performance of Diode Laser 375 nm on the Photosensitized Human Epithelial Type 2 plus Murine Mammary Adenocarcinoma Cell Line (AMN3) Including Hematoporphyrin Derivative

Zahra AL-Timimi .PhD, FRMCR
Laser Physics-College of Science for Women, Babylon University, Hillah, Iraq
dr.altimimizahra@gmail.com

Abstract:

**Background:** Photodynamic performance by employing proper wavelengths of light appropriated with porphyrin derivatives is an adequate system of tumour destruction. Hematoporphyrin derivative has been manifested to selectively confine in neoplastic cells furthermore cause destruction of them via the production of the singlet oxygen while the stimulation by the laser light. The current study aims to enhance in addition to develop the beneficial selectivity of photodynamic treatment by conjugating the Hematoporphyrin Derivative to specific Human Epithelial Type 2 plus Murine Mammary Adenocarcinoma Cell Line (AMN3) in sequence towards the determination of the detailed antigens of a Mammary tumour.

**Methods:** The light utilized in this investigation had been emitting from a diode laser, which had a wavelength of 375 nm. Laser doses had been modified from 5-15 J/cm². The beam of a laser had been adjusted by a qualified tissue culture plate. Cells lines had been exposed to Hematoporphyrin Derivative for 24 hours before the laser exposure. Their concentrations were diversified from 15 μg/ml to 60 μg/ml.

**Results:** Definitely proved the photodynamic activity; of the diode laser appropriated with a photosensitizer. The non-meaningful difference in cells viability had been recognized following neither with the laser doses order with neither the photosensitizer /Hematoporphyrin Derivative only.

**Conclusion:** The results conclude that the diode laser 375 nm had been appropriated with hematoporphyrin derivatives essentially. The more studies on the stimulation of the photosensitizers by laser wavelengths will release the gate wide for the photodynamic medicine of tumours.

**Keywords:** Photosensitizer, Photodynamic, Therapy, Hematoporphyrin, Laser
Patient's age estimation based on convolutional neural network using corneal endothelium images

Nabil Karim Chebbah¹, Mohamed Ouslim¹, Yann Gavet²

¹. Department of Electronics, Université des Sciences et de la Technologie d’Oran USTO, Oran, Algeria
². Ecole Nationale Supérieure des Mines, Saint-Etienne, FRANCE

nabilkarim.chebbah@univ-usto.dz

Abstract:

Background: The analysis of the corneal endothelium spectroscopic images is of great interest in ophthalmology.

Methods: In this work, we investigate the use of the convolutional neural network (CNN) for the estimation of the patient’s age from corneal endothelium images. The database used in this work contains 500 images and patients were divided into 3 groups (young, adult and old)

Results: The performed experiments showed satisfactory performance results. Indeed, CNN model has achieved good accuracy of 77.4% for predicting the patient’s age.

Conclusion: It can be concluded from this work that the use of CNN might be used as a very suitable tool for further research in the ophthalmological field, in particular for the analysis of endothelial images of the cornea.

Keywords: Age estimation, Corneal endothelium, Deep learning, CNN.
Machine learning methods to predict chemotherapy treatment of Multiple Myeloma patients using clinical data

Fatiha YOUBI¹, Nesma SETTOUTI¹, and Meryem SAIDI¹

¹Biomedical Engineering Laboratory, University of Tlemcen, Algeria.
fatiha.youbi@univ-tlemcen.dz

Abstract.

Background: The use of machine learning algorithms to design a chemotherapy treatment protocol is an emerging field in the medical artificial intelligence domain.

Method: In this work, we proposed a chemotherapy treatment protocol recognition system for Multiple Myeloma clinical Data. The used dataset was collected in the Hematology Department, Cancer Control Center, at TLEMCEM University Hospital, Algeria. A comparative study across several classification techniques is developed to find the best framework for recognizing the suitable protocol.

Results: The proposed two-stage framework generates good results. The oversampling step generates a 1095 synthetic dataset which improves the performance of the classifiers.

Conclusion: The choice of chemotherapy treatment protocol is an important step in the treatment of Multiple Myeloma and has a major impact on the patient's prognosis. The random forest algorithm obtains good results for the chemotherapy treatment protocol recognition.

Keywords: Chemotherapy treatment protocol, Machine learning, clinical data, over-sampling.
Classification of Cardiac Abnormality using ECG and HRV signals by Linear Discriminant Analysis

Amel BENABDALLAH ¹ and Abdelghani DJEBBARI ²

¹,² Laboratory of Biomedical Engineering, Faculty of Technology, University of Tlemcen, BP 230, Chetouane, Tlemcen 13000, Algeria
amel.benabdallah@univ-tlemcen.dz

Abstract:

Background: The electrocardiogram (ECG) is one of the most useful tool for the diagnosis and prediction of cardiovascular diseases. In the clinical ECG workflow, the analysis of computerized electrocardiogram (ECG) plays a key role. Besides recent studies focus of changes in the heart's beats-to-beat timing known as heart rate variability (HRV) due to its implications for health and performance.

Methods: This paper presents time-domain HRV features derived from ECG signal. Therefore, MIT-BIH dataset has been studied for abnormality detection and arrhythmic beat classification. The detected R waves and RR intervals are used for HRV time domain analysis. The R–peaks detected from adaptive ECG signal preprocessing using notch filter and wavelet (daubechies6). Then, Arrhythmic beat classification is performed to detect abnormalities in ECG signal using Linear Discriminant Analysis classifier.

Results: As a result, four statistical parameters of HRV signals were computed and considered as features of regular and arrhythmia HRV signals, used in training and test data in the linear discriminant analysis classifier. The use of different sizes of testing datasets allows accuracy variation as well as the classification rate. The effectiveness of the proposed method is verified by experiments, and the classification accuracy of the experimental results reaches 92.85%.

Conclusion: Time domain feature is efficiently employable for recognition of signal abnormality. The obtained results show that the proposed technique outperforms other methods described in the literature by a significant margin. The reliability of the proposed approach is shown through the satisfactory results of preprocessing, feature extraction and classification.

Keywords: Electrocardiogram (ECG), Heart Rate Variability (HRV), arrhythmia detection, statistical features, linear Discriminant Analysis (LDA) classifier.
Remote EEG signal Analysis for Epileptogenic focus detection: a Client–Server Application

Lyna Henaa HASNAOUI¹ AND Abdelghani DJEBBARI²

¹,² Laboratory of Biomedical Engineering, Faculty of Technology, University of Tlemcen, BP 230, Chetouane, Tlemcen 13000, Algeria.

 lynahenaa.hasnaoui@univ-tlemcen.dz

Abstract

Background: Numerous technologies has been developed and devoted to enhance the accessibility and efficiency of Electroencephalogram (EEG) based epileptic seizures diagnosis. However, these tele–technologies are all dedicated to patients with fully controlled seizure with anti–epileptic medications. While the pharmacoresistant category, are totally ignored. Thus, this paper represents a client–server application for remote Epileptogenic Focus Detection (EFD), devoted for patients with pharmacoresistant epilepsy. The EFD represents a crucial factor for a successful seizure free surgery. In which detecting the epileptogenic zone using single channel intracranial electroencephalography (iEEG) is required for cerebral infection risk diminution in comparison with that caused by multi–channel iEEG. Thus, we implemented an automatic server system for EFD, with a promising correct rate of 96% and a client–side application that allows the neurologist to access remotely and easily to these EFD results.

Methods: A mixture of signal processing tools, machine learning methods and telemedecine properties were combined to create Epileptica application.

Result: Epileptica is a client–server system for EEG signal analysis, in which the client side represents the neurologist, who will store the recorded EEG signal in a specific and server shared SQL database, then this EEG signal will be analyzed by the server (biomedical engineer) for seizure onset area detection. Obtained results will be further stored in the same SQL database, where the neurologist could easily and remotely access to them.

Conclusion: The implemented system was adapted to the veritable requirements in relation to the remote diagnosis of pharmacoresistant epileptic patients.

Keywords: Telemedecine; Tele-EEG processing; client-server architecture; pharmacoresistant epileptic.
Breast cancer diagnosis using machine learning on Raspberry pi

Nabil Karim Chebbah¹, Mohamed Ouslim¹

¹ Department of Electronics, Université des Sciences et de la Technologie d’Oran
USTO, Oran, Algeria
nabilkarim.chebbah@univ-usto.dz

Abstract:

Background: Breast thermography is a promising medical imaging technique for detecting breast cancer. However, providing a robust and portable computer aided diagnosis system remains a tedious task.

Methods: In this article, a breast thermography-based computer aided diagnosis system is developed and implemented on a Raspberry pi 4 embedded platform using the cloud computing service as a hardware acceleration solution. Image processing techniques such as preprocessing and segmentation are employed to enable an adequate feature extraction step. The SVM classifier is used in the final step for classifying the breast as normal or abnormal.

Results: After several experimentations, we obtained very interesting and motivating results. The computer aided diagnosis system has shown high performance accuracy in both the segmentation and classification stage. In addition, a low computation time was obtained when using the cloud on the Raspberry PI.

Conclusion: It can be concluded from the results that the implementation of such a decision support system on an embedded system especially when using the cloud computing service, can be a valuable and reliable tool to help radiologists predict breast abnormalities even in remote areas where specialized health care is lacking.

Keywords: Breast thermography, Computer aided diagnosis system, Machine learning, Raspberry Pi, Cloud Computing
Biochemical and structural virulence factors in Candida albicans: what effect of changing pH and temperature?

Sidi Mohammed Lahbib Seddiki¹,²*, Ikram Tefiani¹, Moustafa-Yassine Mahdad ²,³, Zahia Boucherit-Otmani¹, Hidaya Fatima Zohra Touil¹, Chahrazed Bessnouci³,⁴

¹: LAPSAB Lab: Antifungal Antibiotic, Physico-Chemical Synthesis and Biological Activity, University of Tlemcen, Algeria.
²: Laboratory for Sustainable Management of Natural Resources in Arid and Semi-Arid Areas. University Center of Naâma., Algeria
³: PPABIONUT Lab: Physiology, Physiopathology and Biochemistry of Nutrition, University of Tlemcen, Algeria.
⁴: Central medical biology laboratory, Public Hospital Establishment of Naâma, Algeria

seddiki.med@gmail.com

Abstract:

Background: Candida albicans is the most frequently isolated opportunistic yeast in hospitals, it's often responsible for invasive fungal infections. The formation of biofilms and the activity of hydrolytic enzymes are two major virulence factors contributing to the pathogenicity of this species. This study aimed to highlight the activity of hydrolytic enzymes in isolated strains of C. albicans which form biofilms, as well as the effect of the change in pH and temperature on their synthesis.

Methods: The synthesis of phospholipase was determined by the plate method using egg yolk culture medium. For the proteinase activity, agar plates containing bovine albumin serum was used. However, esterase, coagulase and hemolysin were evaluated using the opacity test, the conventional tube test and the sheep blood plaque test, respectively. In addition, phospholipase, proteinase and esterase activities were assessed under different conditions of temperature and pH.

Results: The isolated strains of C. albicans were able to form biofilms and synthesize phospholipase, proteinase, esterase, coagulase and hemolysin; the activities of these enzymes vary differently from one strain to another. C. albicans further exhibited hydrolytic activities.

Conclusion: The interaction significance between the strains, pH and temperature depends on the type of enzymes. This draws attention to the importance of these enzymes to better understand the relationship between the pathogenesis and the virulent process of this species.

Keywords: Candida albicans; biofilms; hydrolytic enzymes; temperature; pH
Anti-hydrolytic effect of herbal extracts in combination with AmB against Candida albicans

Sidi Mohammed Lahbib Seddiki\textsuperscript{1,2*}, Ikram Tefiani\textsuperscript{1}, Moustafa-Yassine Mahdad\textsuperscript{2,3}, Fayza Abbou\textsuperscript{1}, Fayza Moderas\textsuperscript{1}

1: LAPSAB Lab: Antifungal Antibiotic, Physico-Chemical Synthesis and Biological Activity, University of Tlemcen, Algeria.

2 : Laboratory for Sustainable Management of Natural Resources in Arid and Semi-Arid Areas. University Center of Naâma., Algeria

3: PPABIONUT Lab: Physiology, Physiopathology and Biochemistry of Nutrition, University of Tlemcen, Algeria.

seddiki.med@gmail.com

Abstract:

Background: Candida albicans is an important microorganism in the normal flora of a healthy subject. However, its hydrolytic virulence is induced by its expedient pathogenic character. This study aimed to find an in vitro alternative which could preserve the viability of C. albicans while inhibiting its virulent potential.

Methods: The effects of amphotericin B (AmB) combined with extract of Traganum nudatum (E1) or Mentha pulegium (E2) against the activities of esterase, protease and phospholipase were evaluated by calculating the minimum inhibitory concentrations (MIC), which were used to adjust the extract / AmB mixtures in culture media.

Results: The results showed that maintaining a fixed concentration of extracts and lowering that of AmB did not appear to have an effective anti-virulent effect. Hense, the evaluated Pz values, which correspond to the different enzymatic activities, showed a decrease in hydrolytic activities in C. albicans after the addition of E1 / AmB and E2 / AmB combinations at concentrations below the MICs obtained. Furthermore, the addition of 0,375 / 0,25 mg.µg^{-1}.mL^{-1} of E1 / AmB mixture in the culture medium had significantly (P <0,01) contributed to reducing the esterase activity of C. albicans ATCC10231, this was changed from strong to medium (Pz = 0,77 ± 0,01). On the other hand, these mixtures induced complete inhibition of protease activity in this species (Pz = 1). Curiously, E1 / AmB mixture had significantly (P <0,01) induced an increase in this activity in one strain. The phospholipase activity was inhibited under the effect of E1 / AmB and E2 / AmB mixtures. The very significant increase in Pz values (P <0,01) suggests that E1 / AmB and E2 / AmB mixtures may have an interesting anti-virulent effect against phospholipase activity.

Conclusion: The associations E1 / AmB and E2 / AmB (respectively at 0,375 / 0,25 mg.µg^{-1}.mL^{-1} and 1,5 / 0,25 mg.µg^{-1}.mL^{-1}), presented a remarkable in vitro effect against the hydrolytic activities of C. albicans; thus allowing possible reduction of the pathogenesis of this species and would not destabilize the flora equilibrium.

Keywords: Candida albicans; hydrolytic enzymes; Amphotéricin B; Mentha pulegium; Traganum nudatum.
Activation Of The HYPOTHALAMIC-PITUITARY-ADRENAL (HPA) Axis During Scorpion Envenomation: Histopathology And Immunochemistry Analysis

Fares Daachi¹, Sonia Adi-Bessalem¹, Amal Megdad-Lamraoui¹, Fatima Laraba-Djebari¹

¹ USTHB, Faculty of Biological Sciences, Laboratory Cellular and Molecular Biology, Department Cellular and Molecular Biology, BP32, EL Alia, Bab Ezzouar 16111, Algiers, Algeria.
soniabessalem@hotmail.com

Abstract

**Background:** The hypothalamic-pituitary-adrenal (HPA) axis regulating circulating levels of glucocorticoid hormones plays a role in the pathophysiology of scorpion envenomation (SE). The objective of our work is to examine the histopathological effect of *Androctonus australis hector* (*Aah*) venom on experimentally envenomed mice. This was based on histopathologic analysis of the hypothalamus, pituitary and adrenal glands affected in the course of envenomation, and on study the hormonal activity of this axis.

**Methods:** Histopathological effects of Aah venom on the hypothalamus, pituitary and adrenals glands of experimentally envenomed NMRI-mice were carried out. Two groups (A and B) were used. Mice in group A were each inoculated with a dose of (0.75mg/kg s,c) while mice in group B served as controls. Measurement of adrenocorticotropic (ACTH) and corticosterone (CORT) plasma hormones levels as well as immunohistochemistry study of corticotropic cells were also performed.

**Results:** The analysis of our results showed alteration of the initial structure of hypothalamic tissue from animals injected with Aah venom, which revealed after 24 h, an acute neuronal necrosis, vacuolation of the underlying neuropil and infiltration of inflammatory cells. Analysis of the structure of the adenohypophysis and adrenal gland tissue reveals an infiltration of inflammatory cells in pituitary, an hemorrhage in the adrenal cortex and dilation of blood vessels in the two tissues. Moreover, a positive immunostaining of corticotropic cells and increased serum ACTH as well as corticosterone levels indicate activation of the HPS axis.

**Conclusion:** The present study reveals that Aah scorpion venom have an over activity in the HPA axis that is closely associated with some histopathological effects leading to hypercortisolism that might be implicated in the peripheral disturbances. It is hereby recommended that further research be conducted to ascertain any others effects of scorpion venom on these organs in support of the present study.

**Keywords:** Scorpion envenomation, HPA axis, ACTH, Corticosterone, Immuno-histopathology.
Immune-Modulatory Role of Proteasome System in Central Nervous System Tissues during Scorpion Envenomation Pathogenesis

Amal Megdad-Lamraoui1, Sonia Adi-Bessalem1, Fatima Laraba-Djebari1

1 USTHB, Faculty of Biological Sciences, Laboratory of Cellular and Molecular Biology, Department of Cellular and Molecular Biology, BP32, El Alia, Bab Ezzouar 16111, Algiers, Algeria

soniabessalem@hotmail.com

Abstract

Background: Scorpion venom is a complex mixture of peptides that can affect peripheral and central systems of the organism, by the activation of an immune-inflammatory response characterized by the release of different mediators. The proteasome is a protein system involved innate and adaptive immune responses. It is considered to be an important target for the inhibition of several pro-inflammatory mediators’ production. However, no study has demonstrated its role during scorpion envenomation.

Methods: The objective of our study is to assess the immune-modulatory role of this system in the brain and the spinal cord of NMRI mice during scorpion envenomation induced by Androctonus australis hector venom (13 μg / 20 g, s.c.) by the pretreatment with a proteasome inhibitor (bortezomib) administered to the experimental animals by intra-cerebro-ventricular route 15 minutes before the envenomation.

Results: Our study demonstrated that the venom induced an immune-inflammatory response in central tissues marked by an increase in inflammatory markers and oxidative / nitrosative stress and tissue alteration. Bortezomib pretreatment reduced vascular permeability, edema formation, inflammatory cell infiltration and reactive oxygen and nitrogen species production (nitric oxide (P˂0.01), malondialdehyde (P<0.01) ). This treatment prevented the antioxidant system and the histological alterations induced by the venom.

Conclusion: These results reveal the immunomodulatory role of the proteasome in the inflammatory response induced by scorpion venom in the central nervous system tissues, probably by the activation of the gene expression of several inflammatory mediators through the NF-kB pathway or by the generation of peptide ligands presented by the major histocompatibility complex.

Keywords: Scorpion venom, proteasome system, central nervous system tissues, immunomodulation, oxidative stress.
Selenium status in two groups of patients with the diseases newly developed Hashimoto and Basedow autoimmune thyroid diagnosed: Case-control study

Leyla Metahri 1,2, C. Rai 1,3, N. Abourejal 1,4, D. Miloud Abid 1,4

1: Faculty of Medicine Dr Benzerdjeb Benouda, Tlemcen, Algeria
2: Pharmacognosy laboratory / Tlemcen University Hospital Center Algeria
3: Microbiology laboratory / Tlemcen University Hospital Center Algeria
4: Toxicology Laboratory / Tlemcen University Hospital Center Algeria

leylametahri@outlook.fr

Abstract:

Background: Selenium deficiency has been implicated in the emergence of autoimmune thyroid diseases according to epidemiological studies.

Methods: The objective of our study was to evaluate the selenium status in two groups of patients with newly diagnosed autoimmune thyroid diseases of Hashimoto and Basedow compared to two control groups. Therefore, this is an observational, analytical case-control study carried out over a period of 6 months from 01/11/2016 to 01/05/2017.

Results: The study was performed on a sample of 138 subjects including 37 patients with Hashimoto's thyroiditis and 32 patients with Graves’ disease matched to two control groups of the same size. The sex ratio of our population is 0.17 with an average age of 36.46 ± 12.35 and a mean BMI of 26.07 ± 5.10. The comparison between the mean selenium levels of HT and GD cases and their controls by the Student test revealed a significant difference with p = 0.014 and p = 0.016 respectively. Nevertheless, the statistical test of ANOVA has a factor showed no association between the rate of SE and the frequency of consumption of different foods rich in selenium.

Conclusion: From these results, it can be said that selenium deficiency is a risk factor for developing autoimmune thyroid diseases.

Keywords: Selenium, thyroid autoimmunity, Hashimoto’s thyroiditis, Graves's disease.
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