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Scientific Tracks & Abstracts

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Molecular fingerprints of anti- *Candida* antibodies in serum: A mine for clinical biomarker development invasive candidiasis

Aida Pitarch Velasco
Complutense University of Madrid, Spain

Statement of the Problem: Despite great advances in antifungal therapy, invasive candidiasis (IC) remains a significant public health problem worldwide. This opportunistic fungal infection caused by *Candida* spp. (commonly *Candida albicans*) often results in delayed initiation of appropriate antifungal therapy and poor clinical outcomes. We investigated whether molecular profiling of the serum IgG- antibody responses to the *C. albicans* immunome could reveal diagnostic and prognostic signatures that may serve to devise diagnostic and clinical-outcome prediction models for IC and contribute to known clinical factors.

Methodology & Theoretical Orientation: We combined serological proteome analyses (two-dimensional gel electrophoresis followed by Western blot analysis and mass spectrometry) with data mining procedures to explore the serum IgG- antibody responses to *C. albicans* protein species in IC and non-IC patients.

Findings: Unsupervised two-way hierarchical clustering and principal-component analyses of these IgG antibody-reactivity patterns accurately discriminated IC patients from non-IC patients as well as IC survivors from IC non-survivors. Supervised discriminant analyses identified two-IgG and five-IgG antibody-reactivity signatures as the most simplified and accurate IC diagnostic and prognostic predictors, respectively. Multivariate logistic-regression analyses revealed a positive association between these predictors and IC risk or two-month death risk. Receiver-operating characteristic curve analyses indicated that these diagnostic and clinical-outcome predictors for IC outperformed known clinical factors. Further validation of molecular fingerprints of these anti-*Candida* IgG antibodies in serum on multiplexed immunoassays substantiated the serological proteome analysis results (Figure 1).

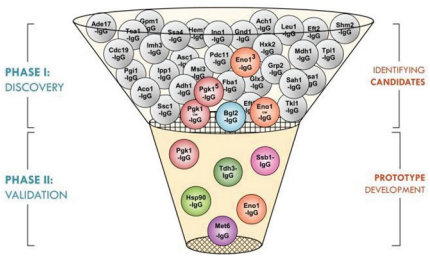

Figure 1. Diagnostic and prognostic biomarkers for IC discovered and validated in this study by serological proteome analysis and multiplexed protoype immunoassays, respectively

Conclusion & Significance: We conclude that these prediction models may be useful to reliably diagnose IC and predict patient clinical-outcome for individualized therapy of IC. Our study shed new light on the anti-*Candida* IgG antibody response development in IC, and further highlights the importance of defining pathogen-specific antigens at the chemical and molecular level for their potential use as diagnostic or prognostic reagents or vaccine candidates for infectious diseases.

Biography

Aida Pitarch Velasco has her expertise in the clinical biomarker development for infectious diseases and in translational research. She has identified a large panel of novel clinical biomarkers and therapeutic candidates for invasive candidiasis. She has built diagnostic and clinical-outcome prediction models for these life-threatening fungal infections based on molecular fingerprints of the serologic responses to the *Candida* immunome. She has also developed new prototype immunological assays for the diagnosis and prognosis of invasive candidiasis. Her studies have further contributed to unraveling the great diversity and complexity associated with the pathogen-encoded immunome.

apitavel@ucm.es

Single-capsule bismuth-based quadruple therapy as second-line or salvage treatment for *Helicobacter pylori* infection: A new window of opportunity in a South-European country?

Catarina Correia[2], Nuno Almeida[2,3], Carina Leal[1], Diogo Branquinho[4], Alexandra Fernandes[1], Carlos Calhau[2], Isabel Bastos[4], Luís Tomé[2] and **Helena Vasconcelos[1]**

[1]Centro Hospitalar de Leiria, Portugal
[2]Centro Hospitalar e Universitário de Coimbra, Portugal
[3]Faculdade de Medicina Da Universidade de Coimbra, Portugal
[4]Centro Hospitalar do Baixo Vouga, Portugal

Introduction: *Helicobacter pylori (H. pylori)* infection is highly prevalent in Portugal and its eradication is formally recommended in multiple circumstances. However, the indiscriminate use of antimicrobials has led to a drastic rise in antibiotic resistance, with failure of traditional eradication schemes. Bismuth was not available in this South-European country, but a single-capsule bismuth-based quadruple treatment became recently available. This study aims to determine whether this quadruple regimen is useful as a second-line or salvage therapy.

Patients and methods: This was a multicentric, retrospective study, with most patients included in a prospective database but without any direct intervention of the investigation team before or during treatment. All consecutive patients that were treated with bismuth-based quadruple therapy as second-line or salvage treatment between July-2017 and October-2018 were enrolled. Their medical records were reviewed and clinical and laboratorial parameters, as well as data on treatment efficacy and adverse events were retrieved. Patients were also contacted by telephone after treatment in order to confirm compliance (considered as adequate when at least 90% of prescribed medication was taken), adverse events and global satisfaction with this specific therapy.

Results: A total of 196 subjects were included (female – 65.8%; mean age – 55.13±13.14 years). Patients had previously completed a mean of 1.12 eradication schemes (0 to 5): triple clarithromycin-based – 33.2%; sequential – 22.4%; concomitant – 7.7%; fluoroquinolone-based – 7.1%; rifabutine-based – 1.0%. The proton pump inhibitor of choice was esomeprazole (42.9%), followed by omeprazole (24%). Compliance was achieved in 93.9% and the overall eradication rate was 90.8% (95% confidence interval: 86.7-94.4). Treatment-related adverse effects were experienced by 83 patients (42.3%), being mild in 39, moderate in 30 and severe in 15. The main drawbacks of the treatment in the patient's perspective were its' high price (45.9%) and the adverse effects (16.8%). Failure to eradicate *H. pylori* was correlated with the following: previous rifabutine-base scheme (15.4% vs. 0%) and higher number of previous treatment regimens (1.94±1.9 vs. 1.03±0.9).

Conclusion: In this South-European country a single-capsule bismuth-based quadruple therapy is an excellent alternative in patients who have failed previous eradication schemes, with acceptable compliance and side effects.

Biography

Catarina Correia, born on December 15, 1991 in Coimbra. She completed secondary education at Colegio São Martinho in Coimbra. She began her master's Degree in Medicine in September 2010 at the School of Health Sciences of the University of Beira Interior completing the same in 2016. That same year she underwent the National Examination of Seriation, obtaining a classification of 93% and position at level 101 nacionally. Her common year was at the Hospital Center and University of Coimbra. She chose the specialty of Gastroenterology in the Department of Gastroenterology of the Hospital and University Center of Coimbra and started the intership in 2018. She is currently at the beginning of her second year of residency.

catarina-jac@hotmail.com

Characterization of carbapenem resistant Gram-negative bacteria and clinical epidemiology

Pooja Sahai
Medica Superspecialty Hospital, India

Background: Carbapenemase-producing Gram negative bacilli (CPGNB) have increasingly been associated with hospital acquired infections in recent years leading to limitations of treatment options. The present study was undertaken to detect CPE, risk factors for acquiring them and their impact on clinical outcomes in a tertiary care hospital from March 2018 to June 2019.

Methods: This prospective observational study included 120 clinically significant Carbapenem resistant isolates (including fermenters and non-fermenters), isolated from samples like blood, lower respiratory tract, urine, pus and tissues etc from March 2108 to June 2019 at a tertiary care hospital in India. Screening for Carbapenemase production was done by phenotypic methods, and Polymerase chain Reaction was performed for genotypic confirmation and to detect genes encoding them. The patients were assessed daily until discharge/death to ascertain the risk factors for infections with Carbapenamase producing Gram negative bacilli and their impact. Both clinical as well as microbiological outcomes were followed up and documented.

Results: Carbapenemase-encoding genes were detected in 77 isolates. The genes detected were New Delhi metallo-β-lactamase, Verona integron-encoded metallo-β-lactamase, and oxacillinase-48 and 181. The significant risk factors associated with acquisition of Carbapenemase producing GNBs were: Transfer from another hospital(53%), mechanical ventilation(85%) recent surgery(55%), hemodialysis(36%), presence of chemoport(6%), tracheostomy(31%), peripheral venous catheter(90%), urinary catheterization(85%), central venous catheter(75%), presence of infected wound(29%) to name a few. The overall adverse outcome was seen on 39% of the cases with CPGNBs.

Conclusion: Infections caused by CPGNBs present daily challenges to Microbiologists as well as Clinicians throughout the world. Unfortunately, the growing problem of multidrug resistance in Gram negative bacteria has become cosmopolitan. As a result, there is an ever-growing problem of increased CPGNBs in hospitals with limited therapeutic options. This return to the pre antibiotic era has unfortunately become the reality of many parts of the world especially in developing countries including India. There is an urgent need to form government policies and assess the processes of antimicrobial prescription and delivery.

Biography

Pooja Sahai is a Consultant Clinical Microbiologist and Infectious Disease (ID) Specialist at a tertiary care hospital in the Eastern part old India (Medica Superspecialty Hospital). She specializes in Molecular Diagnostics including Polymerase Chain Reactions (PCRs), and Nucleic Acid Amplication Technique based Assays in various sub-branches of Infectious Diseases as well as Clinical Microbiology like Bacteriology, Virology, Immunology and Mycology. Her field of interest lies in curbing Antimicrobial Resistance which is spreading its wings in a rampant manner all over the world but especially in India. She is a part of antimicrobial resistance (AMR) surveillance in India and is actively involved in policy making wing of the government associated with Antimicrobial Resistance Surveillance program in India.

drpoojasahai24@gmail.com

Antimicrobial susceptibility pattern of *Enterobacteriaceae* isolated at the French Medical Institute for Mothers and Children, Kabul, Afghanistan

Husna Sahabi and **Mohammad Khalil Elaj**
French Medical Institute for Mothers and Children, Afghanistan

Background:

Antibiotic resistance in *Enterobacteriaceae* is a serious global concern. *Enterobacteriaceae* are responsible for a large proportion of serious, life-threatening infections and resistance to multiple antibiotics in these organisms is an increasing global public health problem. The quick emergence of resistant bacteria is happening worldwide, risking the efficacy of antibiotics. Execution of recommended steps, such as rapid diagnosis, implementation of antibiotic stewardship programs and better infection control measures, are likely to be effective to prevent the spread of ESBLs and other forms of resistance in *Enterobacteriaceae*.

Objectives:

The aim of this study was to determine the frequency of causative organisms belonging to *Enterobacteriaceae* among patients who are suspected having bacterial infections and susceptibility pattern of the isolated bacteria for the commonly used antibiotics.

Material and Methods:

A descriptive Cross-sectional study was conducted. Records of all patients referred or admitted to FMIC and undergone for culture and sensitivity tests on their clinical samples, including blood, urine, sputum, pus, wound and exudates during January 2016 to December 2016 were reviewed. Data was entered and analyzed with the help of SPSS version 22.0. The approval for the data collection was obtained from the Ethical Review Committee of FMIC.

Results: A total of 2500 blood culture, 3600 urine, and 3541 cases of pus and vaginal which was suspected bacterial infection. Totally 6048 cases of blood, urine and miscellaneous identified gram-negative bacteria consecutive.

Conclusion:

All isolated organism was highly resistant to commonly used empirical antibiotics for treatment of *Enterobacteriaceae* like Augmentin, Cephalosporin, inappropriate use of antibiotics by physicians is leading to resistance, mortality and morbidity.

Biography

Husna Sahabi is working in French Medical Institute for Mothers and Children, Afghanistan. Her research interests mainly focuses in the area of Healthcare, Antimicrobial resistance, Infection control and Microbiology.

husna.sahabi2017@gmail.com

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Study of the airborne pollen grains in Rosetta, Egypt

Wafaa K Taia, Mohammed I Abdo and **Iman Bassioni**
Alexandria University, Egypt

An aero palynological study was carried out in the atmosphere of Rosetta city, Egypt during a period of one year from August 2015 until July 2016, using a Hirst type volumetric pollen trap. An annual pollen index of 1991 grains was obtained with the highest pollen records from February till May. The main pollen taxain abundance order are Poaceae, Arecaceae, Chenopodiaceae/Amaranthaceae complex, Casuarina, Cupressaceae, Urtica, Pinus, Myrtaceae. A total of eight pollen types with minimum 10-day mean equal to or greater than 0.1 pollen grains/m3 of air are involved to construct an approximate pollen calendar. The data obtained in this work was compared with others elsewhere in the world. Correlation effects between pollen counts and different meteorological parameters (temperature, rainfall and relative humidity) as well as number of allergic patients were investigated. Most of the recorded pollen grains are of allergenic effects.

Biography

Wafaa K Taia, graduated from Alexandria university, Egypt and got her Ph.D. from Reading university, England. Her major field is Botany, Angiosperm taxonomy, Eco taxonomy and biodiversity. Her main interest is plant taxonomy, allergy, and the effect of environment on the plants. She attained a lot of conferences inside and outside Egypt and has many publications in the above-mentioned items. She is teaching plant taxonomy, Speciation, Angiosperm phylogeny, Palynology, Flora, General Botany and post graduate courses in Alexandria University, Faculty of Science. She had valuable work on the effect of habitats, environmental conditions and sea elevation on the plants. She did many works on allergy, air pollution and causes of environmental disorders. She attained lot off M.Sc. and Ph.D. Juries in Egypt, Saudi Arabia and Spain (MALAGA), as an examiner of the thesis. She has reviewed many scientific papers in her field of interest She published book entitled 'Biodiversity and plant taxonomy': Definition, History and Classification. Lambert Academic Publishing (2017).

e: taia55taxonomy@hotmail.com

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Young Research Forum

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Minimal inhibitory and mutant prevention concentrations of enrofloxacin for Rabbit Entero-Pathogenic *Escherichia coli* (REPEC)

Antonella Schiavone, Capogrosso C, Belloli C, Cocciolo G, Camarda A, Romito D and **Circella E**
University of Bari, Italy

Statement of the Problem: Minimum Inhibitory Concentration (MIC) defines the drug efficacy against bacteria. A novel approach to minimize the risk of resistance selection is based on Mutant Prevention Concentration (MPC) which neutralizes potential mutants. Few data about these topics concerning pathogens of some food-producing species such as rabbit are available. Moreover, the limited number of registered drugs for rabbit farms increases the risk of a frequent use of available molecules, such as enrofloxacin. The aim of this study was to test the sensitivity to enrofloxacin of Entero-Pathogenic *Escherichia Coli* from rabbit's dead by colibacillosis and to investigate the genetic bases of their resistance.

Methodology & Theoretical Orientation: MIC and MPC values were measured by methods previously described with minor modifications. Moreover, the sequences of *gyrA* (DNA gyrase) and *parC* (topoisomerase IV) genes were analysed according to previous studies on colonies before and after MPC evaluation.

Findings: Six sensible strains (33 %) were found while 3 (17 %) and 9 (50%) resulted intermediate sensitive and resistant, respectively. MIC range was 0.008-64 µg/ml. MIC50 and MIC90 were 1 and 64 µg/ml, respectively. MPC values in sensitive and intermediate sensitive ranged from 0.5 µg/ml to 4 µg/ml ($P<0.001$), exceeding the clinical sensitivity breakpoint (0.25 µg/ml).

One additional mutation was found in 7 strains after MPC. The double mutation in *girA* gene (Ser83Leu+Asp87Asn) was not associated to relevant changes in MPC/MIC values, while a single aminoacid substitution (girA: Ser83Leu) were found related to high MPC. The combinations of gyrA (Ser83Leu) + parC (Ser80Iso/Gly78Asp/His77Pro) aminoacid substitutions was associated to to MPC=4xMIC.

Conclusion & Significance: These results highlight the relevance of a correct use of antibiotics to reduce the risk of development of drug resistant bacteria. Moreover, a therapeutic dosage revision is suggested to minimize the selection of antibiotic resistance reducing the reservoir of resistant mutants.

Biography

Antonella Schiavone is graduated in Veterinary Medicine at the University of Bari, where she carries out her activity at the Avian Pathology Unit of the Department of Veterinary Medicine. Her field of expertise includes infectious diseases of rabbits, poultry and wild animals, and her interests also point to many biological and medical features of the poultry red mite *Dermanyssus gallinae*, such as its vectorial role in transmission of infectious diseases, the population dynamics and its epidemiology, its susceptibility to natural and synthetic acaricides. She also carries out studies about the problem of antibiotic resistance. Additionally, she is experienced in the field of web communication, with interest towards animal health and behavior.

a.schiavone2@studenti.uniba.it