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e-Poster

Sameh Monir Abdou Desoky, J Clin Trials 2018, Volume 8
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Development of medical safety data reporting programs and health education centers

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The reporting of medical safety data (especially medical data related to drug effectiveness and patient safety) and the supplying of the health education and general medical culture are very important issues in any society. And as we all live in one world, so, we should deal with these issues as international issues not only as local issues and there are reasons and problems make that only a few percent of the people around the world who can participate or know about these important issues. The purpose of this research to find the main reasons of these problems, and I used a simple questionnaire to get simple answers contain nominal data to get the static analysis of the data easily, and I developed and designed a new comprehensive international database center and programs for health and medical information and drug safety data reporting that are suitable for everybody in the world with different cultures and languages.

Biography

Sameh Monir Abdou Desouki working as a Clinical Pharmacy Specialist at Gizan Public Hospital, Kingdom of Saudi Arabia. His research interest are clinical pharmacy, drug safety, hospital pharmacy, clinical studies.

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The efficiency of inefficiency: Medicine distribution in Sudan

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The strategy of price liberalization and privatization had been implemented in Sudan over the last decade and has had a positive result on government deficit. The investment law approved recently has good statements and rules on the above strategy to pharmacy regulations. Under the pressure of the new privatization policy, the government introduced radical changes in the pharmacy regulations. To improve the effectiveness of the public pharmacy, resources should be switched towards areas of need, reducing inequalities and promoting better health conditions. Medicines are financed either through cost sharing or full private. The role of the private services is significant. A review of reform of financing medicines in Sudan is given in this study. Also, it highlights the current drug supply system in the public sector, which is currently responsibility of the Central Medical Supplies Public Corporation (CMS). In Sudan, the researchers did not identify any rigorous evaluations or quantitative studies about the impact of drug regulations on the quality of medicines and how to protect public health against counterfeit or low-quality medicines, although it is practically possible. However, the regulations must be continually evaluated to ensure the public health is protected against by marketing high quality medicines rather than commercial interests and the drug companies are held accountable for their conduct.

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Antimicrobial stewardship: A general overview and highlight on pharmacist role

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Antimicrobial resistant microbes became a globally recognized threat for humans and one of the most challenging health problems. If resistance continues to grow at the current pace it can lead to 10 million deaths per year by 2050. This burden is in fact caused by both emerging antimicrobial resistance and "dry" pipeline related to antimicrobial industry. Antimicrobial misuse was largely blamed for this widespread resistance and strategies were built to promote rational antimicrobial prescribing. Antimicrobial stewardship is one of the most recognized strategies to limit antimicrobial misuse in healthcare settings. By combining many practices, most notably; limiting the use of antibiotics to the narrowest possible spectrum antimicrobial for the shortest duration of time, antimicrobial stewardship is believed to be one of our most important weapons to be used in the open war against antimicrobial resistance. The most important compelling factor "in my opinion" for antimicrobial stewardship as a primary tool to combat antimicrobial resistance is its feasibility. Antimicrobial stewardship requires minimal financial and time investments to be accomplished and can be configured to fit almost all health care settings. Despite its feasibility and applicability, antimicrobial stewardship is not free of criticism. Pharmacists play a vital role in antimicrobial stewardship programs. In their 2007 guidelines for developing an institutional program to enhance antimicrobial stewardship, IDSA recognize pharmacists (infectious diseases trained) as an essential member and possible co-director for the program. New training courses have been developed to help pharmacists to gain knowledge and skills necessary to fulfill their natural rule in the lead of antimicrobial stewardship programs in their hospitals.

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Role of pharmacist in correction of inappropriate medication in hospitalized geriatrics

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Statement of the Problem: Elderly people with frailty and urgent care needs are major users of health and social care services. The Beers Criteria for the use of Prescription Inappropriate Medication (PIM) in geriatrics are one of the most frequently consulted sources regarding the safety of prescribing medications for older adults. The present study aims to evaluate the rate of PIM and effect of the consultation provided by the clinical pharmacist for alteration of prescription errors.

Methodology & Theoretical Orientation: In all, 240 elderly patients have been evaluated during eight months in the internal and surgery wards of a Taleghani Hospital in Tehran, Iran. Mean age of evaluated geriatrics was 71.2±7.9. In case of any deviation from the Beers Criteria, the clinical pharmacist did an intervention by writing progress notes and talking with physicians for modification in geriatric medication.

Findings: High prevalence of PIM has been shown by Pethidine, Alprazolam and Metoclopramide respectively. As much as 33.3% of the elderly patients had at least one PIM. Moreover, 91.5% of consultations provided by clinical pharmacists have been accepted, resulting in modifications of inappropriate medication. The acceptance for the correction of non-psychotropic medication was better than the psychotropic kind.

Conclusion: Clinical pharmacists play an important role in the modification of the pharmacotherapy of hospitalized elderly patients through consultation with physicians.

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Challenges in breast cancer treatment and drug safety

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Breast cancer is the most common cancer in women worldwide. It is also the principle cause of death from cancer among women globally. Despite the high incidence rates, in Western countries, 89% of women diagnosed with breast cancer are still alive 5 years after their diagnosis, which is due to detection and treatment. Breast cancer incidence has been increasing. In 2015, an estimated 231,840 new cases of invasive breast cancer are expected to be diagnosed in women, along with 60,290 new cases of non-invasive (*in situ*) breast cancer. About 2,350 new cases of invasive breast cancer are expected to be diagnosed in men in 2015. A man's lifetime risk of breast cancer is about 1 in 1,000. Breast cancer incidence rates in the US began decreasing. One theory is that this decrease was partially due to the reduced use of Hormone Replacement Therapy (HRT) after the results of a large study called the Women's Health Initiative were published in 2002. These results suggested a connection between HRT and increased breast cancer risk. About 5-10% of breast cancers can be linked to gene mutations. Mutations of the BRCA1 and BRCA2 genes are the most common. On average, women with a BRCA1 mutation have a 55-65% lifetime risk of developing breast cancer. For women with a BRCA2 mutation, the risk is 45%. Breast cancer that is positive for the BRCA1 or BRCA2 mutations tends to develop more often in younger women. An increased ovarian cancer risk is also associated with these genetic mutations. In men, BRCA2 mutations are associated with a lifetime breast cancer risk of about 6.8%; BRCA1 mutations are a less frequent cause of breast cancer in men. All drugs for breast cancer treatment developed and in market cause mild to several side effects and the safety, pharmacovigilance, signal detection a and risk management of breast cancer drugs are difficult to manage. A series of challenges of breast cancer therapy and the drug safety will be discussed at the meeting.

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Levofloxacin loaded nano-niosomes for controlled release ocular drug delivery

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The current study aimed to increase ocular residence time of levofloxacin by formulation into controlled release nano-niosomes for once daily administration. Levofloxacin loaded niosomes were prepared by the film hydration technique with aid of sonication, utilizing either chloroform or dichloromethane as a solvent, methanol as a co-solvent, span 60 as a surfactant; cholesterol as a surfactant-additive agent; Dicetyl Phosphate (DCP) as a charge inducer. Nine niosomal formulae were prepared and characterized for Entrapment Efficiency (EE%), morphological features, Particle Size (PS), Polydispersity Index (PDI), Zeta Potential (ZP), pH and *in vitro* release. Based on the results of these studies, certain formula was further investigated for its morphology using transmission electronic microscopy; sterilization using gamma-irradiation; stability upon storage; *in vivo* evaluation. The selected nano-niosomal formula showed good EE% and was found to be stable upon storage after being exposed to sufficient doses of gamma-irradiation. *In vivo* testing of the selected formula showed that the niosomes extended levofloxacin release up to 24 hours without causing any ocular irritation. This formula exhibited superior microbiological activity compared to the commercial eye drops.

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Irrational use and non-prescription sale of antibiotics in Ethiopia, a need for change: A case study conducted at Shambu General Hospital, Shambu, Ethiopia

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The sale of antibiotics without medical prescription has been observed in many countries. The practice is more pronounced in developing and low income countries where legislations and regulations are weak. In these countries, antibiotics are illegally purchased without medical prescriptions and very little effort has been made to tackle the situation. The role of pharmacists in contributing to healthcare remains debatable. In Ethiopia, there are deficiencies in the quality of current professional practice. Community pharmacists are now seen as retailers and businessmen rather than health care providers. Ethiopians are therefore left to accept the helpful and harmful practices such pharmacists. Self-medication with antibiotics is a universal problem and variations regarding such practices are obvious around the globe. The practice cuts across culture, gender, age, health status, social status, race and occupation. Irrational use of antibiotics increases the risk of bacterial resistance and adverse drug reactions. It has been found to produce various adverse effects in humans. It is the objective of this paper to discuss the irrational use and non-prescription sale of antibiotics in Ethiopia. It discusses the evidence, the concept of self-medication, resistance and interactions, legislation, probable solutions, changes in practice and the concept of sustainability which would help guarantee the appropriate sale and rational use of antibiotics in Ethiopia.

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Antitumor and acute toxicity studies of 4-(pyridin-4-yl)-6-(thiophen-2-yl)pyrimidin-2(1*H*)-one against Ehrlich ascites carcinoma and sarcoma-180

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In an effort to discover an effective and selective anti-tumor agent, 4,6-diarylpyrimidones as constrained chalcone analogues have been synthesized were evaluated against a panel of human cancer cell lines. Striking selectivity was displayed by the compounds against MiaPaca-2 (breast) cell lines while PC-3 (prostate) and A-549 (lung) cell lines were almost resistant to the exposure of the test compounds. Compound SK-25 exhibited remarkable cytotoxicity against MiaPaca-2 cell line with an IC50 value of 1.95 μM and was found to induce apoptosis evidenced through phase contrast microscopy, DAPI staining, mitochondrial membrane potential loss. The cell phase distribution studies indicated that the apoptotic population increased from 1.79% in control sample to 30.33% in sample treated with 20 μM compound SK-25. The anti-tumor efficacy of SK-25 was investigated on Ehrlich ascites tumor (solid), sarcoma 180 (solid) tumors and Ehrlich ascites carcinoma. The compound was found to inhibit tumor development by 94.71% in Ehrlich Ascites Carcinoma (EAC), 59.06% in Ehrlich Tumor (ET, solid) and 45.68% in Sarcoma-180 (solid) at 30 mg/kg dose. Additionally, SK-25 was established to be non-toxic at a maximum tolerated dose of 1000 mg/kg in acute oral toxicity in Swiss-albino mice. The current study provides insight for further investigation of the anti-tumor potential of the molecule.

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Toxicity study of poly-herbal formulation in Wistar rats

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The renowned eight herbs considered in the use of traditional system of medicine for the treatment of piles are the main constituents of the Pile Relief Formulation (PRF). Every single herb is proven as a safest drug but the effects are yet not identified when they are used in combination with each other. Hence, the present investigation is carried out to elucidate toxicological profile of PRF in rats in terms of acute and sub-acute oral toxicity. The OECD guidelines 420 and 407 were used to perform acute and sub-acute oral toxicity study respectively. In case of acute toxicity study, single 2000 mg/kg oral dose of PRF was administered in female albino Wistar rats, while for sub-acute oral toxicity study various dose like 50, 250 and 500 mg/kg daily for 28 days were administered in both male and female albino Wistar rats. The effect of PRF on body weight, relative organ weights (liver, kidney, lung, heart, brain), biochemical (cholesterol, triglyceride, urea, creatinine, AST, ALT, bilirubin, protein, uricacid, RBS), hematological (RBC, WBC, HB, Monocytes, lymphocytes, eosinophils, PCV, MCV, MCH, MCHC, PLT) and histopathological parameters were characterized. No mortality or behavioral changes in rats treated with single dose of 2000 mg/kg was observed so PRF is considered to be safe at this dose. No significant changes in body weight, relative organ weights, biochemical, hematological and histopathological parameters with three different dose levels were observed in sub-acute toxicity study for 28 days. The result clearly demonstrated the absence of acute and sub-acute oral toxicity of PRF in order to prove safety evidence for its use in animals. However, further animal and clinical experiments are needed for safety and efficacy of the pile relief.

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Electro-membrane extraction combined with capillary electrophoresis for the determination of Metoclopramide and Ondansetron in urine samples

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Electro-Membrane Extraction (EME) is a sample preparation technique in pharmaceutical, chemical, clinical and environmental analysis. This technique uses electro-migration across artificial liquid membranes for selective extraction of analytes and sample enrichment from complex matrices. This method has many advantages such as simplicity, rapid, low-cost, low LOD, high pre-concentration factor and high recovery. In the present work, simultaneous pre-concentration and determination of two basic drugs namely Metoclopramide (MCP) and Ondansetron (OSN) were studied using EME as a suitable extraction method, followed with Capillary Electrophoresis (CE) using Ultraviolet (UV) detection as separation technique. The drugs were extracted from 4 ml sample solutions, through a Supported Liquid Membrane (SLM) consisting 2-Nitrophenyloctylether (NPOE) impregnated in the walls of a polypropylene hollow fiber and into a 20 µL acidic aqueous acceptor solution resent inside the lumen of the hollow fiber with a potential difference applied over the SLM. The variables of interest, such as chemical composition of the organic liquid membrane, stirring speed, extraction time and voltage, pH of donor and acceptor phases and salt effect in the EME process were investigated and optimized. Under optimal conditions NPOE as SLM, stirring rate of 1000 rpm, 200 V potential differences, 20 min as the extraction time, acceptor phase HCl (pH 1.0) and donor phase HCl (pH 1.5). After the micro-extraction process, the extracts were analyzed by CE with optimum conditions phosphate running buffer (pH 2.0), applied voltage of 20 kV and 25 °C. Under the optimum conditions, Limits of Detection (LOD) and quantification (LOQ) for MCP and OSN were 2.31-2.68 and 7.72-8.91 ng mL^{-1}, respectively. Pre-concentration factor and RSD for five replicates of each drug were calculated to be 200 and 4.06-3.93, respectively. Finally, the applicability of this method was studied by the extraction and determination of these drugs in urine samples with recovery percentages of 87-92%.

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Evaluation of farmers' first aid knowledge in most common injuries at work in agriculture: A pilot study

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According to the international labor organization, agriculture is one of the most dangerous industries. The aim of this study was to evaluate the level of knowledge of first aid concerning the most common injuries that occur in agricultural work among Polish farmers in the years 2013-2014. The study was conducted in two stages. At first, data from the Polish agricultural social insurance fund was analyzed with reference to the incidence and the type of injuries in agriculture. Then research was carried out by means of a survey based on the data obtained in the first stage. The study was preliminary and it was carried out on a sample of 51 persons. The most common cause of the 41,702 incidents qualified as an accident in agriculture in Poland in the years 2013 and 2014 was a fall from heights. Every fourth respondent had witnessed or had been directly involved in an accident in agriculture. Despite the fact that everyone declared familiarity with the principles of first aid, over a half of the respondents had never given it. All of the respondents declared having knowledge of the principles of first aid, however, research shows that their knowledge is incomplete and not consolidated. Due to the fact that there are few reports on the research topic, it seems advisable to continue it in a larger study group.

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The association between cardiorespiratory fitness and physical activity levels of central obese adults in Enugu State (eastern part), Nigeria

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Central obesity and its implicated adverse health conditions are a major concern of some people. Central obesity is one of the predisposition factors to cardiovascular disease, respiratory conditions, type-2 diabetes mellitus, cancer and others. The purpose of this study was to determine the relationship between central obesity, cardiorespiratory fitness and physical activity level among adults in Enugu State. 317 subjects (158 obese and 159 non obese) who met the inclusion criteria and gave their informed consent participated in the study. Their waist to hip ratio was determined using measuring tape. Body mass index is measured with stadiometer and weighing scale. Cardiorespiratory fitness was determined using Harvard step test and International Physical Activity Questionnaire (IPAQ) was used to determine their physical activity level. Data collected was analyzed descriptively and inferentially using correlation test. The level of significance was set at p=0.01. The physical activity level of obese adults in Enugu state increases in an ascending order of vigorous, low, moderate while the cardiorespiratory fitness decreases in reverse direction as low, average, good, excellence and very low. There was a significant relationship between cardiorespiratory fitness and physical activity (r=0.146, sig=0.009). There was also a significant relationship between waist-hip ratio and cardiorespiratory fitness (r=-0.221, sig=0.000). In this seminar, I will discuss the effect of central obesity on cardiorespiratory fitness and physical activity on adults and its pathophysiology.

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Orodispersible films of a polymorphic poorly soluble drug: Effect of casting solvent, film forming agent and solubilizer

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Cairo University, Egypt

In the current work, a full factorial experimental design was utilized to formulate piroxicam into orodispersible films while investigating the effects of some formulation factors on the properties of the resulting films. These factors were: (1) The casting solvent: Water and acetone/water mixture, (2) the film forming agent: HPMC K4M and Na-alginate and (3) the solubilization system: No solubilizer, L-arginine, poloxamer and L-arginine/poloxamer mixture. 16 formulation runs were prepared by solvent casting method to obtain 10 mg piroxicam dosage units. Drug particle size in the prepared formulations and dissolution efficiency at 30 minutes were selected as responses variables. Additionally, the prepared films from each formulation were evaluated for other characters as drug content, thickness, residual water, etc. A selected formulation was then evaluated for its *in vivo* disintegration, palatability and stability. Utilizing acetone in the casting solution, Na-alginate as film forming agent or both of them resulted in formation films with larger drug particles and slower dissolution. Combined use of L-arginine and poloxamer showed better drug dissolution than using each alone. HPMC was more favorable than Na-alginate regarding mechanical properties and moisture absorption. Films from the selected formulation showed fast *in vivo* disintegration and acceptable palatability. These films were stable for six months under accelerated storage conditions.

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Enhancement in bio-ethanol production in electrochemical cell using *Saccharomyces cerevisiae* and *Wickerhamomyces anomalus*

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Ethanol production by the yeast strains *Saccharomyces cerevisiae* and *Wickerhamomyces anomalus* was done by simultaneously cultivating the yeasts in the anode and the cathode of an electrochemical cell alternatively on either side of the electrolytic compartments. When *Saccharomyces cerevisiae* was cultivated on a platinum plate anode and *Wickerhamomyces anomalus* was cultivated in graphite rod cathode and an external electric potential of 4 V was applied to induce the electrochemical redox reaction in the anode and cathode compartment of an electrochemical cell using glucose as a substrate, 27.61±0.35 mg/ml ethanol was produced, however counter combination produced only 24.78±0.45 mg/ml ethanol. Electrochemical oxidation potential inhibited *Wickerhamomyces anomalus* but showed a reduced effect on Saccharomyces cerevisiae. Graphite rod when modified by the immobilization of neutral red as a mediator of electron transfer showed improvement in ethanol production. The *Wickerhamomyces anomalus* when cultured with modified graphite rod and *Saccharomyces cerevisiae* when cultured in the anode 11.67% more than the neutral red non-immobilized combination of *Saccharomyces cerevisiae* and *Wickerhamomyces anomalus* and 64.28% more than that of the control maintained without the supply of external voltage. Further the optimized technique is going to use for ethanol production from lignocellulosic hydrolysate.

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A documentary review study of bacterial pathogen resistance to antimicrobial

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Statement of the Problem: Antimicrobial resistance is an umbrella term referring to resistance of different types of microorganisms to various antimicrobial agents which occurs naturally but is facilitated by the inappropriate use of medicines. It is becoming a serious threat to global health as it is increasing worldwide requiring an integrated global action.

Methods: A documentary review study of laboratory results of patients at National Health Laboratory was carried out to determine the pattern of antimicrobial resistance for bacterial isolates. All samples brought to the microbiology laboratory were included in the study. Statistical analysis of data was done using Statistical Package for the Social Sciences (SPSS) version 20.

Results: Out of 398 total samples, 149 samples had shown bacterial growth. Of these 149 samples, 48 were tested for *E. coli* and found to be resistant to ampicillin (87.5%) and sensitive to chloramphenicol (72.9%); 20 were tested for *Klebsiella* sp. found to be resistant to ampicillin (75%) and sensitive to chloramphenicol in (80%), 18 tested for Citrobacter sp. found to be resistant to ampicillin in 100% and sensitive for amikacin in 61%, 11 tested for *Pseudomonas* sp. found to be resistant to majority of the drugs ampicillin, nalidixic acid and tetracycline, 81.8% each.

Conclusion: According to results obtained the practice of rational drug use has to be strictly applied and continuous surveillance for antimicrobial drug sensitivity test to be done in order to assure appropriate drug administration for treating disease and reducing the emergence of new resistant strains of bacteria.

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The application of epidemic dynamics on the prediction and prevention of Hand-Foot-and-Mouth Disease (HFMD) induced by EV71 virus

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Objective: The study aimed to develop an epidemic dynamics model for the transmission and prevention of Hand-Foot-and-Mouth Disease (HFMD) induced by EV71 virus.

Methods: A SEIR model for susceptible, exposed, infected and recovered HFMD patients was created based on research results and actual incidences of HFMD in China using mathematical and epidemic dynamical methods. Time-fitted curves determined by the relevant parameters were adopted to simulate the epidemic process and the effectiveness of the model with and without an intervention was evaluated.

Results: Comparison of the results of data fitting to the model for HFMD cases occurred in China from 2009 to 2015 with the actual incidence showed that the model fitted well to the maximum number of infected HFMD patients and that the simulated trend of epidemic process was identical to that of the actual situation. Implementation of intervention measures was demonstrated to effectively delay the onset of HFMD epidemic peaks and reduce the number of incidence during peak seasons. Finally, we make use of the parameter values of the year 2013 and 2014 to simulate and forecast the number of patients of 2015 and the predictive results inosculate well with the real-world situations.

Conclusion: The model created in this study is suitable for simulating the spread of HFMD in China and may be used to evaluate the effectiveness of relevant intervention and preventive measures.

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Biochemical and biological effects of irisin in a model of diabetes mellitus

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Diabetes Mellitus (DM) is a highly prevalent health problem affecting more than 425 million people worldwide. It is associated with several detrimental complications such as neuropathy, nephropathy, retinopathy and cardiovascular diseases. Irisin is a novel hormone that plays a role in metabolism by stimulating the browning of White Adipose Tissue (WAT) into beige adipose tissue which acquires properties that are similar to those of Brown Adipose Tissue (BAT). Several studies have attempted to characterize the roles of irisin in DM and obesity, however, contradictory results have been reported and physiological roles of irisin have been questioned by several researchers. In our study, we investigated the role of irisin in controlling glucose levels and insulin secretion in STZ-induced DM model and the mechanism by which irisin exerts its beneficial effects both in vivo and *in vitro*, using a variety of biochemical, morphological and cell biology techniques. We showed that irisin did not cause any significant reduction in weight or fasting blood glucose, however, it caused a significant glucose reduction 30 minutes after glucose challenge. Our data also showed that irisin co-localizes with insulin in pancreatic β-cells in both normal and diabetic animals while it co-localizes with glucagon only in diabetic animals. Moreover, irisin was also detected in skeletal muscle, visceral and subcutaneous adipose tissues. Irisin also reduced triglycerides and increased the level of High Density Lipoprotein (HDL) and total protein. We also provided evidence that irisin treatment can modulate the tissue level of different peptide hormones such as insulin, glucagon, incretins and leptin. In addition, irisin possesses a potent antioxidant activity and reversed oxidative stress induced by DM. Our *in vitro* investigations showed that irisin can stimulate the release of insulin from pancreatic β-cells. Irisin could be a potential therapeutic agent in the management of DM.

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Medication adherence among diabetic and hypertensive patients in Al-Qassim region of Saudi Arabia

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Non-adherence to medication is often an unrecognized risk factor that contributes to failure of the therapeutic plan. The purpose of this study was to identify factors related to high, medium and low medication adherence among adult Saudi patients with hypertension and diabetes mellitus. This study is designed as a descriptive cross sectional survey and was conducted in three tertiary care hospitals of Al-Qassim province of Saudi Arabia. The data was collected using the 8-item Morisky Medication Adherence Scale (MMAS-8) and analyzed by SPSS. Three levels of adherence were considered based on the following scores: 0 to <6 (low); 6 to <8 (medium); 8 (high). Of the 396 patients interviewed, 52% reported low adherence to prescribed medication. Multinomial logistic regression analysis was conducted. Gender, age, literacy level, duration of illness and type of chronic disease were negatively associated with medication adherence. Patients with low adherence showed significantly higher level of forgetfulness in taking their medication (47.2%) followed by carelessness (40.7%). Participants with low and medium adherence had shown significant concern about their medication, in which 27.8% had stronger belief that medication is overused, harmful and addictive in nature. The study shows very high proportion of low and medium adherence on long term medication, which may be responsible for the failure of achieving therapeutic outcome. Further investigation is required to evaluate the applicability of MMAS-8 as a tool of measuring medication adherence among Saudi patients with chronic diseases. Adherence enhancing strategies should also be evaluated in separate patients group.

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In vitro immunomodulatory activity of chrysin (5, 7-dihydroxyflavone) isolated from *Indigofera tinctoria* on macrophage via NF-κB signaling pathway

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In the present investigation, in vitro immunomodulatory effect of natural flavonoid chrysin isolated from Indigofera tinctoria leaves was evaluated on murine macrophages (RAW 264.7 cells). The chrysin was purified and structure was elucidated by spectroscopic analysis including UV- visible, FTIR, NMR (13C, 1H) and GC–MS. The immunomodulatory activity of different concentrations of chrysin (25, 50, 75 and 100 µg/mL) was analyzed on normal and LPS(10 µg/mL) stimulated macrophage with various assays including cell proliferation, nitric oxide (NO) production, phagocytosis, ROS generation, gene expression and NF-κB nuclear translocation. The results revealed that, chrysin was significantly increased the proliferation of macrophages as well as phagocytic function of macrophages in dose dependently. Moreover, the preliminary and essential features of phagocytosis such as superoxide anions production, lysosomal and pinocytic activity of macrophages was significantly enhanced upon chrysin treatment. On the other hand chrysin significantly debited the ROS generation, NO production and increased the arginase activity on LPS stimulated macrophage. The expression of pro-inflammatory cytokine such as TNF-α & IL-6 and pro-inflammatory mediators such as iNOS & COX-2 and the expression also dose dependently decreased by chrysin in LPS treated macrophages. Moreover, the chrysin treatment was greatly reduced the NF-κB activation and subsequently decreased the NF-κB nuclear translocation. Collectively, the present findings suggested that a natural flavonoid chrysin can increased the innate immune response by enhancing macrophages functions through NF-κB signaling pathway and explored the strong immunomodulatory potential.

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Fighting the root cause of rheumatoid arthritis: Discovery of protein arginine deiminase type IV inhibitors

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Protein Arginine Deiminase IV (PAD4) is a promising therapeutic target for Rheumatoid Arthritis (RA). The main objective of this research is to search for potent inhibitors for PAD4. Three approaches were applied in this research: structure-based, ligand-based and peptide-based drug designs. LIDAEUS and Ultrafast Shape Recognition (USR) programs were utilized in virtual high throughput screening. Three out of 22 of the top-ranked water-soluble compounds identified by LIDAEUS program showed significant inhibition to PAD4. The IC50 values were ranged from 1.49±0.03 to 2.96±0.01 mM. The structures of the three compounds showed no resemblance with previously discovered PAD4 inhibitors, nor with existing drugs for RA treatment. A previous reported inhibitor, streptonigrin, was used as a parent compound in ligand-based virtual screening using USR. Five compounds out of 37 compounds screened inhibited PAD4 significantly. The best compound was a moderate inhibitor for PAD4 with IC50 value of 362.67±4.13 μM. The common structural feature of the compounds discovered by LIDAEUS and USR was furan ring. Peptide-based inhibitors incorporated with non-standard amino acid containing furan ring were designed and synthesized. The peptide-based inhibitors have IC50 value of 243.2±2.4 μM which was lower than compounds obtained from LIDAEUS and USR. Inhibitors containing furan ring have high potency in inhibiting PAD4 and the inhibitors discovered in this research could be further developed to a better drug candidate for treatment of rheumatoid arthritis.

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Comparison of three sample size estimation methods for non-inferiority vaccine trials with multiple continuous co-primary endpoints

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Combination vaccines have been extensively used for decades and bring together the issue of intersection-union. To make up for the reduction in statistical power at the study level, researchers have to increase the study sample size. In view of the nature of immunogenicity variables, we use the geometric mean concentration of immune response after vaccination as immunologic endpoint and compare three sample size calculation methods: The "inflation factors" method, the "incrementing method" and the Bonferroni correction method when there are multiple continuous co-primary endpoints. The parameters are set according to the actual situation of combination vaccines and the simulation results were used as reference. The present study demonstrates that the "incrementing method", the Bonferroni corrected method and the "inflation factors method" are all available when the effect size of each endpoint is comparable and there is no or weak correlation between each endpoint. When there is a valid difference of effect sizes among endpoints, the "incrementing method" performs better.

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My inhaler tutor: The impact of new individualized video in improving asthma patient's inhaler technique and asthma control

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Introduction & Aim: Asthma is a chronic condition affecting millions of people around the world. Inhaled medications are effective therapies for asthma management and patients can get the maximum benefit of their inhalers when performing the correct inhaler technique. Smartphones have helped people in many ways, but their value in teaching and assessing people on correct inhaler use has not been evaluated previously. The purpose of this study to evaluate the effect of individualized video using smartphones in improving asthma patient's inhaler technique.

Methodology: 198 asthma patients were recruited then allocated to active or control groups. Their inhaler technique for Turbuhaler (TH) or the pressurized Metered-Dose Inhalers (pMDI) were assessed, using predefined published checklists. Patients in active group were asked to perform their inhaler use while videotaping their own videos, which were replayed showing them what incorrect steps they had done. Control group's inhaler technique was assessed using physical demonstration only. All patients were re-evaluated following intervention according to their group. Over three months, all patients were reassessed. Baseline and follow-up respiratory symptoms were measured by reliever use (puffs/day), Asthma Control Test ACT, in addition to Forced Expiratory Volume in first second (FEV1).

Findings: For all patients, Correct Inhaler Technique (reported as percentage correct steps) was improved after the intervention: TH (63% Active vs. 23% Control, p=0.001) pMDI (69% active vs. 43% control, p=0.01). Reliever use (puffs/day) decreased (as improvement): TH (2.3 puffs/day Active; 6.5 puffs/day control, p=0.001), pMDI (2.6 puffs/day active, while 9.2 puffs/day control, p=0.005). Subjects' asthma control test scores improved by decreasing proportion of patients at severe stage for TH and pMDI active groups.

Conclusion & Significance: This intervention reveals that the individualized video as a smartphone's application used in this dynamic study significantly improved inhaler technique, reliever use, ACT, and FEV1 for asthma patients, resulting in durable efficacy for improving inhaler use by patients, consequently improving patient's asthma clinical outcomes.

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Double checking process and risk factors in pediatric treatment

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Childrens are more susceptible to medication errors than adults. Medication administration process is the last stage in the medication treatment process and most of the errors detected in this stage. Little research has been undertaken about medication errors in children in the Middle East countries. This study was aimed to evaluate how the pediatric nurses adhere to the medication administration policy and to identify any medication preparation and administration errors or any risk factors. An observational, prospective study of medication administration process from when the nurses preparing patient medication until administration stage (May to August 2014) was conducted Saudi Arabia. 12 pediatric nurses serving 90 pediatric patients were observed. 456 drug administered doses were evaluated. Adherence rate was variable in 7 steps out of 16 steps. Patient allergy information, dose calculation, drug expiry date were the steps in medication administration with lowest adherence rates. 63 medication preparation and administration errors were identified with error rate 13.8% of medication administrations. No potentially life-threating errors were witnessed. Few logistic and administrative factors were reported. The results showed that the medication administration policy and procedure need an urgent revision to be more sensible for nurses in practice. Nurses' knowledge and skills regarding to the medication administration process should be improved.

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