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Assessment of lung involvement using HRCT among vaccinated and non-vaccinated elderly COVID-19 patients admitted in a designated hospital, Tamil Nadu - A retrospective study

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Abstract

Introduction: The COVID-19 pandemic is considered one of the most devastating situations globally, the worst affected were the senior citizens. A number of initiatives were carried out to control the COVID-19 pandemic; one such important measure is the development of COVID-19 vaccines to prevent the disease. But the continuous emergence of new SARS-COV2 variants (antigenic drift) and its demographic variation in virulence makes the vaccine's efficacy questionable. This study is intended to evaluate the association between the degree of lung involvement and the effectiveness of vaccination against the disease in cases admitted to a designated hospital in Tamil Nadu.

Materials and methods: A hospital records-based-retrospective research was conducted among COVID-19 patients admitted from the 1st of April 2021 to the 31st of May 2021, and information was gathered regarding their vaccination status, comorbid conditions, and CT severity score (CTSS) in the HRCT lung report. A consecutive sampling technique was used to choose the study participants; about 120 participants were included in the study. The Chi-square test and Fisher's extract test were used to evaluate the hypothesis. The relationship between a dependent variable and independent factors was estimated using multiple linear regression.

Results: Among 120 participants, about 60.2% were males and 39.8% were females. Vaccination status and comorbid conditions had a significant association with severe lung involvement in COVID-19 patients.

Conclusion: Non-vaccinated patients had severe lung involvement based on the HRCT lung scan findings than the vaccinated patients. To reduce mortality, it is essential to ensure universal coverage of COVID-19 vaccination.

Keywords: COVID-19 vaccine; CT severity score; geriatric.

Figures

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Effect of chlorpyrifos and its metabolites on skeletal system development of chick embryo

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Abstract

Research focus: Chlorpyrifos is an organophosphate insecticide used primarily to control pests on a variety of food and feed crops. Humans are directly or indirectly exposed to this pesticide through food, air, and occupation. The ill effects of chlorpyrifos on various organ systems of human has been widely documented, but less is known about its influence on human bones.

Aim: To analyze the effect of chlorpyrifos and its metabolites 3,5,6-trichloro-2-pyridinol (TCPy) on the skeletal system of the chick embryo.

Materials and methods: Fertilized chick eggs were exposed to different concentrations of chlorpyrifos and its metabolite 3,5,6-TCPy on 1.5 days of incubation. The proximal phalanx of 18-day-old embryos was analyzed for defects in growth and ossification through histopathology, immunohistochemistry, angiogenesis assay, and gene expression study.

Results: Dose-dependent variations in developing bone of chick embryo were observed. Histochemical and histomorphometry studies of proximal phalanx showed increased in the growth plate length ($F(9, 59) = 228.9509$, $p = .00001$) with a reduction in the total length of the phalanx ($F(9, 59) = 109.9905$, $p = .00001$), decreased mineralization ($F(9, 59) = 224.6872$, $p = .00001$), decreased blood islands in the bone marrow ($F(9, 59) = 7.7083$, $p = .0001$) of chlorpyrifos, and 3,5,6-TCPy-exposed group. Significant downregulations in the expression patterns of the transcription factors, such as SOX9, RUNX2, and ALP, were also observed.

Conclusion: Chlorpyrifos and its metabolite 3,5,6-TCPy exposure alters the chondrogenesis in the growth plate cartilage of long bone in chick embryo. The pesticide and its metabolite also interfere in ossification.

Keywords: 3,5,6-trichloro-2-pyridinol; bone; chick embryo; chlorpyrifos; histopathology.

Related information

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Pharmacophoric Evaluation of Compounds Isolated from GC-MS Analytical Method of Aqueous Extract of *Azadirachta indica* Leaves

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Abstract

The majority of current pharmaceuticals are derived from traditional plants; one of these, *Azadirachta indica*, also known as neem, has a variety of therapeutic applications ranging from simple infections to cancer. All of these pharmacological effects are due to the secondary metabolites present in the various plant parts. Diverse researchers made numerous attempts to identify the active ingredients using techniques such as Gas Chromatography-Mass Spectrometry (GC-MS), High-performance liquid chromatography (HPLC), and High performance thin-layer chromatography (HPTLC), among others. The GC-MS technique is used to isolate various secondary metabolites from the leaves of an aqueous extract of *A.indica*. The isolated compounds were analysed for their pharmacokinetics and pharmacodynamics properties using software such as SWISSADME, OPENBABEL, Swiss target prediction, etc. The aqueous extract of *A.indica* yielded 13 compounds, but only 5 compounds showed the highest number of hits; those with the highest concentration were chosen to obtain the pharmacodynamic, pharmacokinetic, and toxicological profiles. All five compounds are non-toxic and can be administered orally, and molecules with specific properties are capable of modulating a variety of

4

Effect of quarry dust on hematological variations among stone quarry workers

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Abstract:
Stone quarries are an unregulated sector that generate harmful substances into the environment. Exposure to these inhalable substances poses to have a deleterious impact on the health of the workers. India has the highest occupation related mortality in the world. The present study is a step towards finding out the association of stone quarrying and its harmful effect on the hematological parameters, to ascertain the changes due to dust inhalation. This study was performed on exposed group consisting of 75 individuals who belonged to different exposure levels to quarry dust (<5years, 5-10 years and >10 years) and the control group consisted of 45 selected individuals without any firsthand exposure. Significant difference was observed between the hematological profile of the groups by unpaired 't' test and univariate analysis using SPSS version 21.0. The results showed that the values of white blood cell (WBC), lymphocytes (LYM), monocytes (MID), mean corpuscular hemoglobin (MCH), and platelets (PLT) were significantly increased in exposed workers ($p \leq 0.05$*) whereas red blood cell (RBC) hematocrit (HCT), and Hemoglobin (Hb%) were significantly lower ($p \leq 0.00$**). This study emphasizes the importance of regular assessment of the environmental pollution, periodic health screening and necessitates the usage of personal protective equipment to protect them from occupational hazard.

Keywords: Quarry dust, occupational exposure, health impact, hematological parameters

Introduction

Occupation or a job is an activity that one engages in the society for their existence or luxury that provides a social status in the community, based on the educational qualification or skills. in spite of the benefits, every occupation holds certain risks either caused accidently or a disease caused on exposure to certain hazardous substances. Hence, Occupational hazard is a major threat to the wellbeing of every worker. Stone quarry workers are not an exception to such hazards faced during work. Stone quarry is a inevitable sector that provides raw materials for construction [1].

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Comparison Between Maternal Blood Glucose and Fetal Cord Insulin Level Among Gestational Diabetes Mellitus Women

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Abstract

Introduction: Offspring of gestational diabetes mellitus (GDM) mothers are at high risk of developing insulin resistance, type 2 diabetes mellitus (T2 DM), and cardiovascular complications later in life. So, screening maternal blood glucose during pregnancy and identifying high-risk infants immediately after birth is necessary to prevent the potential long-term implications. Aim: To correlate the maternal fasting and post-prandial blood glucose withfetal insulin level. Materials and methods:A case-control study, was conducted at Chettinad Hospital and Research Institute, India, between May 2019 to May 2020. A 75-gram OGTT was performed among pregnant women between 24 to 28 weeks of pregnancy for diagnosing GDM according to American Diabetes Association (ADA) guidelines. 94 GDM mothers and Non-GDM mothers and theirnew-bornswere taken up for this study. 2.5ml of maternal venous blood was collected in a vacutainer containing sodium fluoride and EDTA as an anticoagulant for FBS and PPBS estimation. Some mothers on induction of labor were posted for emergency LSCS (for failed induction and non - progression of labor) and some had normal vaginal deliveries. Plasma FBS and PPBS estimation in the mother's blood sample was assayed by the Hexokinase method in Siemen'sDimension RxLMachine immediately after centrifugation. 2.5ml of umbilical cord

SKIN

ORIGINAL RESEARCH

A Randomized Controlled Study of Topical Benzoyl Peroxide with Oral Doxycycline Versus Topical Benzoyl Peroxide with Oral Lymecycline in Acne Vulgaris

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ABSTRACT

Background: Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit, which has a variable course with acute or insidious onset, relapses, and recurrences. It is one of the most common diseases of patients attending the dermatology clinic. Tetracyclines are the most common oral antibiotic prescribed for acne vulgaris.
Aims: Our study aims to compare the efficacy of topical 2.5% benzoyl peroxide gel (BPO) with oral doxycycline versus topical 2.5% benzoyl peroxide gel with oral lymecycline in the treatment of acne vulgaris.
Methods: The study included 100 patients with acne vulgaris divided into two groups of 50 each. Group A was treated with topical 2.5% benzoyl peroxide gel once daily application at night and capsule doxycycline 100mg twice a day and Group B was treated with topical 2.5% benzoyl peroxide gel once daily application at night and capsule lymecycline 408 mg once a day for 12 weeks. The primary assessment was done using Indian Association of Acne (IAA) grading at baseline and then every fortnight for 12 weeks. Patients were followed up for another 12 weeks after completion of the study.
Results: The grade wise distribution of acne based on IAA grading between the two groups was compared. Chi square test and p-value for all 3 grades of acne at baseline, 2 weeks, 4 weeks, 6 weeks, 8 weeks, 10 weeks, and 12 weeks showed statistical improvement among patients in group B at 2, 8 and 10 weeks with p-values of 0.01,0.01 and 0.007, respectively.
Conclusions: From our study it is evident that lymecycline is superior to doxycycline, with much statistical significance among moderate to severe acne.

INTRODUCTION

Acne is a very common and unique disease of human beings.[1] Acne involves the inflammation of the pilosebaceous unit with varied manifestations including comedones, pustules, papules, cysts, nodules, and scarring. [2]

Tetracyclines are the most common oral antibiotic prescribed for acne vulgaris in patients above 12 years. They are classified as first generation (tetracycline, chlortetracycline, oxytetracycline, and demeclocycline), second generation (doxycycline, lymecycline, meclocycline, methacycline, minocycline, and rolitetracycline) third generation (tigecycline),

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RESEARCH ARTICLE
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EFFECT OF ACORUS CALAMUS LINN ON ASTROCYTES IN THE SUBGRANULAR ZONE OF THE DENTATE GYRUS IN THE HIPPOCAMPAL REGION IS NEUROPROTECTIVE.

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Abstract

Our objective was to examine and uncover the neuroprotective properties of the plant Acorus calamus linn, also referred to as Vacha. Any form of stress is a major contributing factor to a number of ailments. In the future, a medication molecule with the ability to minimize cellular damage, boost antioxidant levels, and combat stress will be required. Thus, a total of 24 male Wistar albino rats—that is, 6 groups of animals—were used in the current investigation. Dimethyl sulphoxide (1 mL/kg/p.o./day) was given as a control. Stress: administered 1 mL/kg/p.o./day of dimethyl sulphoxide and underwent 6 hours of restraint per day. EE-ACL: Mammals ACL ethanolic extract (100 mg/kg/p.o./day) was received. Alpha-asarone (9 mg/kg/p.o/day) was administered 30 minutes prior to undergoing 21 days of restraint stress. Sigma Plot 13.0 was utilized for data analysis. According to the findings, rats given an ethanolic extract of Acorus calemus Linn and active principle alpha-asarone prior to stress demonstrated noticeably better spontaneous alteration behavior in the Y maze test. Additionally, the drug-treated groups' corticosterone levels were lower than those of the stress group. The amount of neurons in the dentate gyrus region of the hippocampal regions in drug-treated groups remained comparable to those in the control group, as indicated by toludine blue staining. In the drug-treated groups, glial fibrillic acidic protein immunoreactivity revealed newly proliferating astrocytes that looked like stars. The fibers were thin and had a regular course. The findings imply that the central nervous system is produced by phytochemicals, specifically those found in polyphenolic compounds, glycosides, flavonoids, alkaloids, and triterpenoids, have a relaxing effect . The rhizome of Acorus calamus linn, which is rich in these phytochemicals, effectively reversed changes brought on by stress by reducing neuroinflammation and enhancing cognitive function.

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Original Article

Assessment of Knowledge, Attitude, and Practices of Personal Protective Equipment among Health Care Providers in Tamil Nadu, South India

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ABSTRACT

Introduction: Personal protective equipment provides considerable protection from hospital-acquired infections. Ample knowledge with a positive attitude and best practices of personal protective equipment by healthcare workers is indispensable to get protection themselves and to serve humanity. The study aimed to assess the knowledge, attitude, and practice (KAP) regarding personal protective equipment (PPE) among healthcare workers along with possible determinant factors.

Methods: An observational cross-sectional study was conducted from August - September 2022 among 386 healthcare workers in Tamil Nadu, South India. The structured self-administered questionnaire was used for data collection. The study comprised questions evaluating a socio-demographic profile, knowledge, attitude, and practice of personal protective equipment. Descriptive statistics (percentage, frequency, mean) and inferential statistics (Chi-square test) were used for the data analysis.

Results: The overall knowledge of the participants was satisfactory (73.3%). Physicians had a good knowledge level against non-physicians ($p<0.05$). It was observed that the 30 and more years of experience group has less knowledge ($p<0.05$). A positive attitude toward PPE was noted in 58.3% of the participants. Statistical significance in the attitude of participants with education, occupation, and experience was not observed ($p>0.05$). Good practice of PPE was followed by 66.8% of participants. Nurses (91.7%) showed good practice of PPE than physicians and laboratory technicians and was found to be statistically significant ($p<0.05$).

Conclusion: The findings demonstrated that most healthcare workers had an overall good knowledge, positive attitude, and good practice regarding PPE however they need periodical training and auditing.

Keywords: Attitude, health care workers, knowledge, personal protective equipment, practice.

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Effectiveness of BBV152 vaccine and ChAdOx1-S vaccine in preventing severe disease among vaccinated patients admitted to a designated COVID-19 hospital in India

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Abstract

Purpose: Coronavirus disease 2019 (COVID-19) is a highly formidable disease. Globally, multiple vaccines have been developed to prevent and manage this disease. However, the periodic mutations of severe acute respiratory syndrome coronavirus 2 variants cast doubt on the effectiveness of commonly used vaccines in mitigating severe disease in the Indian population. This study aimed to assess the effectiveness of the BBV152 vaccine and ChAdOx1-S vaccine in preventing severe forms of the disease.

Materials and methods: This retrospective study, based on hospital records, was conducted on 204 vaccinated COVID-19 patients using a consecutive sampling approach. Data on their vaccination status, comorbidities, and high-resolution computed tomography lung reports' computed tomography severity scores were extracted from their medical records. Fisher's exact test and binomial logistic regression analysis were employed to assess the independent associations of various factors with the dependent variables.

Results: Of the 204 records, 57.9% represented males, with a mean age of 61.5±9.8 years. Both vaccines demonstrated effective protection against severe illness (90.2%), with BBV152 offering slightly better protection compared to ChAdOx1-S. Male gender, partial vaccination, comorbid conditions, and the type of vaccine were identified as independent predictors of severe lung involvement.

Conclusion: This study indicates that both vaccines were highly effective (90%) in preventing severe forms of the disease in fully vaccinated individuals. When comparing the two vaccines, BBV152 was slightly more effective than ChAdOx1-S in preventing severe COVID-19.

Keywords: Aged; COVID-19 vaccine; CT severity score; SARS-CoV-2; Vaccination.

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Cytotoxic effect of Imeglimin on T47D and MDA-MB-231 cell Lines of Human Breast Cancer – An In-vitro study (AbstractView.aspx?PID=2024-17-9-3) (https://scholar.google.co.in/scholar?q=Cytotoxic effect of Imeglimin on T47D and MDA-MB-231 cell Lines of Human Breast Cancer – An In-vitro study)

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Ferulic acid attenuates streptozotocin induced alternation in glycoprotein moiety via regulation of carbohydrate metabolic enzymes in rats

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Abstract

Ferulic acid is a naturally occurring polyphenolic compound that is generally found in plants, vegetables, and fruits. Although ferulic acid has been widely utilized to treat a variety of illnesses, there have been no studies done yet on its potential protective effects on the glycoprotein moiety in streptozotocin-induced diabetic rats. The goal of this study was to concentrate on this issue. Streptozotocin was administered intraperitoneally once to male Wistar albino rats to cause diabetes. Using commercial diagnostic kits, we assessed plasma glucose and glycated haemoglobin (HbA1c). Plasma insulin level was assayed with the help of an enzyme—linked immunosorbent assay (ELISA) kit and other assays were made biochemically. In diabetic rats, the levels of blood glucose and HbA1c

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Case Report

A dermatological odyssey: Levamisole's Triumph over warts, vitiligo, dermatophytosis, and pityriasis versicolor in a young patient

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ABSTRACT

In our case, we observe the presence of various conditions within the same patient, including prevalent benign lesions caused by the human papillomavirus (HPV) known as warts. These warts, occurring in both mucosal and skin regions, can contribute to significant morbidity for affected individuals. Additionally, the patient exhibits vitiligo, a common acquired skin disorder characterized by well-demarcated white patches resulting from the loss of melanocytes in the epidermis. Although different theories exist regarding the pathogenesis of vitiligo, the exact etiology remains unknown. Alongside, the patient presents with two common fungal infections, namely pityriasis versicolor and dermatophytosis. The coexistence of all these dermatological conditions in a single patient highlights the complexity of the case.

1. Introduction

Warts, benign lesions caused by the human papillomavirus (HPV), can manifest in both mucosal and skin regions, with over 100 identified types of HPV. These lesions may occur at any site on the body. In contrast, vitiligo is an acquired pigmentary skin disorder characterized by the absence of pigmentary cells in the epidermis, resulting in white macules and patches. The condition is often associated with autoimmune disorders, with thyroid abnormalities being the most common. While the exact etiology of vitiligo remains unknown, various theories attempt to explain its pathogenesis. Vitiligo is further classified into three types based on distribution and pattern: generalized, segmental, and localized.

Additionally, pityriasis versicolor, also known as tinea versicolor, is a common, benign, superficial fungal infection affecting the skin. Clinical features include hyperpigmented or hypopigmented finely scaled macules, with the trunk, neck, and proximal extremities being the most frequently affected sites.

2. Case Report

A 25-year-old male patient, employed as a sailor in the Indian Navy, presented with complaints of multiple asymptomatic verrucous raised lesions on both upper and lower limbs for the past three months. Additionally, he reported asymptomatic flat white patches over the right shoulder and arm persisting for the past three years. The patient also experienced itching in the gluteal region and groin for the last month. Notably, there was no history of fever, atopy, or drug intake preceding the onset of these lesions. The patient mentioned a recent hospitalization for jaundice three months ago, after which the verrucous lesions appeared. During his hospital stay, he received treatment for jaundice and underwent a blood transfusion to address low hemoglobin levels.

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Core Decompression with Bone Marrow Aspirate Concentrate Implantation in Osteonecrosis of the Femoral Head with a Minimum of 2-year Follow-up - A Pilot Study

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Abstract

Introduction: Osteonecrosis of the femoral head (ONFH), resulting from impaired blood supply to the head of the femur, presents a significant challenge to clinicians due to its debilitating nature. Conservative treatment often offers insufficient pain relief and debilitating functional outcomes which necessitate alternative therapies. Bone marrow aspirate concentrate (BMAC), a potent orthobiologics and rich in mesenchymal stromal cells and growth factors, holds good promise as the minimally invasive procedure for ONFH. With the preceding research suggesting clinical and functional efficacy, we assessed the therapeutic effectiveness of BMAC in ONFH management in joint preservation.

Materials and methods: A prospective cohort study was conducted with 20 patients suffering from ONFH who failed to respond to 6 months of conservative treatment. A uniform surgical procedure was performed by a single surgeon, involving bone marrow extraction from the anterior iliac crest and subsequent processing into an 8-10 mL of BMAC concentrate. The BMAC was then injected into the implanted into the decompressed femoral head. The post-operative protocol comprised weight-bearing mobilization, physiotherapy, and a 4-week NSAID-free regimen. Outcome measures included pain scores, hip function, knee symptoms, sports activities, patient satisfaction, and recommendation of the procedure.

Results: Of the 20 patients suffering from ONFH, primarily the left side, most of whom were at stage 2b, significant pain reduction and functional improvement were observed over 24 months. The mean pain score decreased from 9.00 to 3.55, while the hip function score increased from 46.12 to 88.60. However, some patients encountered complications such as symptom recurrence (5%), disease progression (10%), and persistent pain (5%).

Conclusion: Core decompression with BMAC implantation emerges as a promising, effective, and safe treatment for ONFH with better costeffectiveness and minimal side effects, making it a feasible treatment alternative.

Keywords: Femoral head; bone marrow aspirate concentrate; decompression; osteonecrosis.

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Original Research Article

Unraveling the tapestry of adverse cutaneous drug reactions: A clinico-epidemiological study

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ABSTRACT

Background: It is widely acknowledged that adverse drug responses on the skin can cause serious complications. Up to 2% of all adverse cutaneous medication eruptions are severe and life-threatening, however the majority of these reactions are benign. In order to quickly diagnose these grave cutaneous eruptions and start the necessary treatment, physicians should be aware of certain warning signs. To understand the causative drug, meticulous history and complete clinical examination is the key

Objective: Primary objective is to find the common group of drugs causing adverse cutaneous drug reactions. Secondary objectives are to study their morphology, gender and age distribution.

Materials and Methods: The cross-sectional study involved 130 patients. Informations including relevant history, clinical examination details, and drugs taken were noted in the pretested proforma. Quantitative and qualitative data were collected and graphically analysed. Data was studied under various aspects which included causative drugs, clinical presentation, age and gender ratio. SPSS Version 21.0 was used for most analysis and Microsoft Excel 2010 for graphical representation.

Results: Maculopapular rash, acneiform eruptions, urticarial rash, exfoliative dermatitis and fixed drug eruptions were the commonest forms of clinical presentations seen in our study. The cutaneous drug reactions were classified as per the study of Agarwal et al.

Conclusion: The limitations of treating adverse cutaneous drug reactions are the varied range of clinical symptoms, the complexity of the various drug-host interactions, and the relative scarcity of laboratory tests that are available for any conclusive and confirmatory drug-specific testing. That's why knowledge of clinical presentations and common drugs causing it is a must.

1. Introduction

Drugs are substances that can heal, control, or prevent diseases. Negative drug responses occur when a drug causes an unwanted or detrimental consequence (ADRs). Roughly 5% of all hospitalizations are due to them.[1] An adverse cutaneous response caused by a drug is any change in the structure or function of the skin, its appendages, or mucous membranes.[2,3] The incidence of Cutaneous adverse drug reactions among both outpatients and hospitalized patients in the Indian population was found to be 9.22 per 1,000.[4] Up to 2% of all adverse drug eruptions are severe and life-threatening. Hence their sound knowledge is of key importance to save lives with the earliest interventions possible.

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Review Article

Revolutionizing dermatology: The role of artificial intelligence in clinical practice

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ABSTRACT

AI (Artificial Intelligence) has transcended the field of science fiction and become a crucial component of various industries, including healthcare. In dermatology, the incorporation of AI is reshaping clinical practices, diagnostics, and treatment strategies. This article delves into the transformative impact of AI in clinical dermatology, exploring its applications, benefits, and the evolving landscape of AI-driven advancements.

1. Introduction

Artificial intelligence (AI) holds a prominent position in the realm of computer science research, signifying a significant frontier in technological progress. Although AI has made substantial contributions to various medical fields over time, its integration into dermatology is a relatively recent and limited development.[1] Dermatologists, armed with a profound comprehension of AI concepts, can exploit the wealth of dermatoscopic and clinical data and images associated with skin conditions, positioning dermatology as a promising domain for AI applications in the field of medicine. Ongoing research encompasses diverse studies utilizing AI to tackle skin disorders like onychomycosis, atopic dermatitis, psoriasis, and skin cancer. This paper offers a comprehensive summary of AI, examining its current applications in dermatology and delving into potential future developments in this dynamic intersection of technology and skin health.[2]

The Association for the Advancement of Artificial Intelligence (AAAI) defines AI as "the scientific understanding of the mechanisms underlying thought and intelligent behavior and their embodiment in machines." Put simply, AI is a field of computer science that creates software with the goal of imitating human cognition and the analysis of complex data.[2,3]

2. Discussion

History: Mathematician Alan Turing authored a groundbreaking article titled "On Computable Numbers, With an Application to the Entscheidungs problem," which is widely acknowledged as the foundational work of the computer age. Collaborating with Princeton colleague Alonzo Church, Turing utilized calculus to introduce the notion of "effective calculability," establishing the basis for the computational model now recognized as an "algorithm".[3]

The term "artificial intelligence" (AI) was coined during a significant Dartmouth College conference in 1956. In the early 1970s, researchers in the medical field recognized the potential of AI applications in life sciences. However, technological limitations of the time hindered widespread AI use. Over the past two decades, advancements in computing power, fueled by improvements in hardware and software technologies, have increased awareness of AI's

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Histone-Lysine *N*-Methyltransferase 2D (KMT2D) Impending Therapeutic Target for the Management of Cancer: The Giant Rats Tail

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ABSTRACT: The histone-lysine *N*-methyltransferase 2D (KMT2D), tumor suppressor gene which is the major component of histone H3K4 mono-methyltransferase in mammals and has significant role in regulation of a gene which are frequently mutated that lead to many different types of cancers that include non-Hodgkin lymphoma, medulloblastoma, prostate carcinoma, renal carcinoma, bladder carcinoma and lung carcinoma. KMT2D gene epigenetic alterations in histone methylation play a significant role for the initiation and progression of cancers from pre-cancerous lesions, yet its complete function in oncogenesis remains unsolved. KMT2D deficiency - loss are thought of initial mediators of cancer development and cell migration such as B-cell lymphoma, medulloblastoma, melanoma, pancreas and lung cancer. The KMT2D loss has know to activate glycolytic genes that promote aggressive tumor progression. Therefore, the present review serves to underline the update on recent research pertaining to KMT2D gene, that could be a potential therapeutic target in downregulating glycolytic genes such as Pgk1, Ldha, Pgam1 and Gapdh; 2, epidermal growth factor receptor tyrosine kinase (EGFR-TK) - ERBB2, RTK-RAS signaling, RAS activator genes Rgl1, Rasgrp1, Rasgrf1, Rasgrf2 and Rapgef5 in suppressing the tumor progression that may represent novel targeted therapy for the management of cancer. This review will facilitate to understand the gene expression that inhibits cancer progression and which could serve as a potential molecular target in understanding cancer pathogenesis.

KEY WORDS: KMT2D, lung cancer, methyltransferase, tumor suppressor gene

I. INTRODUCTION

Histone-lysine *N*-methyltransferase 2D (KMT2D), histone H3K4 mono-methyltransferase in mammals located at chromosome region 12q13.12, which has an significant role in gene regulation, development of diseases and promotes cancer development.[1] H3K4 (methyl group on histone H3 lysine 4 residue) where the cells active promoters and enhancer are marked by tri-methylation H3K4 and mono- and di-methylation of H3K4 respectively.[2] In mammals there are six sets of H3K4 methyltransferases such as KMT2A, KMT2B, KMT2C, KMT2D, KMT2F and KMT2G.[1] Sequence homology studies of SET-containing enzymatic subunits have demonstrated that KMT2C and KMT2D are homologous to Trr (trithorax related), KMT2A and KMT2B are homologous to Trx and KMT2F and KMT2G are homologous to dSet1.[3] KMT2D have significant role in regulation of the gene which are frequently mutated that lead to cancer progression.[1] Epigenetic alterations of KMT2D histone methylation and acetylation are important for the initiation and progression of cancers from pre-cancerous lesions.[4] KMT2D are an predominant elements on enhancer regions and has limited efficient redundancy with KMT2C which has been proved in human colon cancer cell line HCT 116 cells.[4] KMT2D is also known to binds to specific enhancer region selectively that depends on the cell stage of

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Preparation, characterization of green synthesis FeO nanoparticles and their photocatalytic activity towards Basic Fuschin dye

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Molecular docking analysis of imeglimin and its derivatives with estrogen receptor-alpha

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Abstract

Estrogen receptor-α (ER- α) is a principal endocrine regulatory protein in breast cancer. The progression of ER-α positive breast cancer is slowed by selective estrogen receptor modulators such as Tamoxifen. But, long term therapy with Tamoxifen leads to resistance. Therefore, it is of interest to document the Molecular docking and pharmacokinetic analysis of imeglimin derivatives with ER-alpha. Among the 166 derivatives of Imeglimin, only five derivatives were shortlisted after toxicity testing. The selected derivatives showed good binding affinity with favorable pharmacokinetic profiles. The selected compounds of Imeglimin were found to

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Aqueous Extracts of Glycyrrhiza Glabra Linn and Diosmetin Effect on Ambulatory and Behavioral Functioning in Wistar Rats with Ethanol-Induced Cognitive Impairment.

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KEYWORDS

Diosmetin; Glycyrrhiza Glabra behavioural function; cognitive impairment

ABSTRACT

The aging process, exposure to various chemicals, radiation, and stressful situations can contribute to the degeneration of nerve cells in the brain, leading to cognitive decline. Alcohol-induced mild cognitive impairment (MCI) is a growing concern among middle-aged adults, affecting emotional response, memory, and learning processes. The hippocampal region, a crucial component of the limbic system, plays a primary role in memory and learning. Alcohol-induced MCI is associated with oxidative stress, cholinergic system damage, and inhibition of key receptors in various brain regions. Ethanol alters processes dependent on glutamatergic and dopaminergic inputs, resulting in cognitive impairment. Younger individuals may be more susceptible to ethanol's effects on motor and cognitive functions. This study explores the potential therapeutic benefits of natural products in mitigating ethanol-induced neurotoxicity, focusing on the aqueous extract of GGL (AqGg) and Diosmetin (Dm). AqGg, a herbal extract frequently used in the Indian medical system, is known for its memory and learning-enhancing properties. Diosmetin, a well-known antioxidant molecule, has shown promise in improving working memory and spatial learning. The research aims to investigate the antioxidant properties of AqGg and Dm in protecting against cognitive and ambulatory impairment induced by ethanol. The study includes an assessment of the impact on declarative and episodic memory, considering corticostriatal and limbic system-hippocampus connections

INTRODUCTION:

The nerve cells in the brain may die off as a person ages, is exposed to different chemicals or physical agents, is exposed to radiation, or experiences stressful situations. Due to excessive alcohol intake, alcohol-induced mild cognitive impairment (MCI) is a growing social issue among middle-aged adults. The ability to act on emotional experiences, remember past information, and identify new information is known as cognition. One of the limbic system's components and the primary area for memory and learning is the hippocampal region. The creation, storage, and retrieval of declarative and episodic/declarative memory at corticostriatal and limbic system-hippocampus connections depend on glutamatergic and dopaminergic inputs(Calabresi et al, 2016). Alcohol-induced MCI is brought on by oxidative stress, damage to the cholinergic system, and inhibition of the α-