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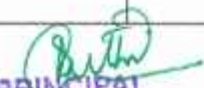
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3	AN OVERVIEW OF CLINICALLY IMPERATIVE AND PHARMACODYNAMICALLY SIGNIFICANT DRUG INTERACTIONS	DR. B. Raj Kapoor	CURRENT CARDIOLOGY REVIEWS	2022	1875-6557	https://www.eurekaselect.com/journal/16	https://www.eurekaselect.com/article/123390




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REVIEW

A Comprehensive Review of the Pharmacologic Perspective on Loop Diuretic Drug Interactions with Therapeutically Used Drugs

Author(s): Naina Mohamed Pakir Maideen, Rajkapoor Balasubramanian* and Sudha

Muthusathy

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188-199

Background: Loop diuretics help to manage the patients with edema associated with congestive heart failure, liver cirrhosis, and renal disease and hypertension. The patients taking loop diuretics may receive other medications to treat comorbidities leading to drug interactions.

Methods: The literature was searched in databases such as Medline/PMC/PubMed, Google Scholar, Cochrane Library, Science Direct, EMBASE, Web of science, Ebsco, Directory of open access journals (DOAJ) and reference lists were used to spot relevant articles using keywords: Drug interactions, Pharmacodynamic interactions, Loop diuretics, Bumetanide, Ethacrynic acid, Furosemide, and Torsemide.

Results: Loop diuretics are associated with hypokalemia, ototoxicity and other adverse effects. The drugs affected by hypokalemia and having the potential of inducing ototoxicity could interact with loop diuretics pharmacodynamically. Loop diuretics can interact with drugs such as amphotericin B, digoxin, angiotensin-converting enzyme inhibitors (ACE inhibitors), antidiabetic drugs, antifungal agents, dobutamine, gossypol and scopolamine due to diuretic associated hypokalemia. In addition, the risk of strychnine toxicity could be enhanced by the concomitant use of loop diuretics and cisplatin, aminoglycoside antibiotics or phosphodiesterase 5 (PDE 5) inhibitors. Loop diuretics may also interact pharmacodynamically with drugs like captalesperrin, ceritinib, levostyroxine, pizantione, probenecid, lithium, nonsteroidal anti-inflammatory drugs (NSAIDs), sulfonureas and herbal drugs.

Conclusion: Clinicians, pharmacists and other health care providers should take responsibility for the safe use of medications. In addition, they are required to be aware of the drugs interacting with loop diuretics to prevent adverse drug interactions.

Keywords: [Drug interactions](#), [loop diuretics](#), [furosemide](#), [bumetanide](#), [torsemide](#), [ethacrynic acid](#).



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A Review on Cosmetics Causing Contact Urticaria

[Merin Shaji](#), [K. A Merin](#), and [R. Kameswaran](#)

Abstract

Physical appearance is more strongly pursued than ever in today's world and is considered to provide confidence, success and self-esteem. Cosmetics are the important product in beauty market and their growth is unstoppable. It is estimated that about 95% of women and 75% of men were daily using cosmetics. Despite the considerable use of cosmetics, most people are unaware of its adverse reactions. Urticaria is severe as well as the most common adverse reaction caused by cosmetics. Major cosmetics that cause urticaria include fragrance, preservatives, hair care products, lip plumpers, plant- and animal-derived products, bindi or kumkum, nail cosmetics, glycol peel, permanent makeup and tattoos, etc. This review provides a brief explanation of the cosmetic components that cause urticaria.

KEY WORDS: *Cosmetic, Urticaria, Reaction*

Introduction

According to European legislation, cosmetics are substances or a mixture of substances used for application to external surfaces of the human body such as epidermis, hair, lips, and external genitalia, teeth or mucosa of the oral cavity with the only principle aim of cleaning, perfuming or modifying its appearance and or masking body odours. Cosmetics include personal hygiene products (e.g. gels and soaps) and moisturizers (e.g. creams, lotions), hair products (e.g. shampoos and lotions), toothpaste, make-up, nail products (e.g. nail polish and artificial nails), fragrances (e.g. deodorants and perfumes), hair removal products and sunscreens. These are divided into two on the skin and rinsed off the skin. Cosmetics that are left on the skin include lotions, cream fumes, etc. Rinsed off the skin cosmetics are shampoos and other detergents. [1]

Feedback





Current Cardiology Reviews

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An Overview of Clinically Imperative and Pharmacodynamically Significant Drug Interactions of Renin-Angiotensin-Aldosterone System (RAAS) Blockers

Author(s): [Ihanna Mohamed Pakir Mardien](#), [Bajkanoor Balasubramanian](#), [Sudha Muthusamy](#) and [Venkateswaramurthy Nallasamy](#)

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Abstract

Introduction: Hypertension is a leading cause of cardiovascular disease and chronic kidney disease, resulting in premature death and disability. The Renin-Angiotensin-Aldosterone System (RAAS) blockers, including Angiotensin-Converting Enzyme (ACE) inhibitors or Angiotensin Receptor Blockers (ARBs), are used as first-line antihypertensive therapy to treat hypertensive patients with comorbidities, including diabetes, ischemic heart disease, heart failure, and chronic kidney disease. The use of RAS blockers is associated with the risks, such as hyperkalemia, angioedema, etc. The drugs potentiating them interact pharmacodynamically, resulting in adverse consequences. This review article focuses on the clinically important drug interactions of RAAS blockers.

Materials and Methods: The electronic databases, such as Medline/PubMed Central/PubMed, Google Scholar, ScienceDirect, Cochrane Library, Directory of Open Access Journals (DOAJ), Embase, and reference lists were searched to identify relevant articles.

Results: The risk of hyperkalemia may be enhanced potentially in patients receiving a RAS blocker and potassium-sparing diuretics, potassium supplements, trimethoprim, adrenergic betablockers, antifungal agents, calcineurin inhibitors, pentamidine, heparins or an NSAID, concomitantly. The patients taking ACE inhibitors and mTOR inhibitors, DPP4 inhibitors, atezplase, or sacubitril/valsartan concurrently may be at increased risk of developing angioedema.

Conclusion: Clinicians, pharmacists, and other healthcare practitioners should be accountable for medication safety. To avoid adverse implications, prescribers and pharmacists must be aware of the drugs that interact with RAAS blockers.

Keywords: [Drug interactions](#), [RAAS blockers](#), [ACE inhibitors](#), [angiotensin-receptor blockers](#), [aldosterone-receptor antagonists](#), [pharmacodynamic interactions](#).

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Research Article

Antimalarial Effect of the Root of *Silene macrosolen* A. Rich (Caryophyllaceae) on *Plasmodium-berghei*-Infected Mice

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Background. Malaria remains a major public health problem globally. Poor access to antimalarial drugs compounded with rapidly evolving drug resistance encourages researchers to continuously look for new drugs. Of importance, traditionally used medicines of plant origin are the highest priority as the ethnobotanical claim can be used as an important clue for its safety and efficacy profiles. *Silene macrosolen* A. Rich (Caryophyllaceae) has been traditionally used for malaria treatment in Ethiopia. Therefore, this study was aimed to evaluate the *in vivo* antimalarial activity of the plant against *Plasmodium-berghei*-infected (ANKA strain) Swiss albino mice. **Methods.** The dried powdered root of *Silene macrosolen* was extracted using 80% methanol. The crude extract was fractionated using chloroform, ethyl acetate, and distilled water that have different affinities to plant phytoconstituents. The *in vivo* antimalarial activities of the crude extract were evaluated using 4-day suppressive, prophylactic, and curative tests. The antimalarial activity of the solvent fractions was evaluated in a 4-day suppressive test. The oral acute toxicity of the crude extract was also determined according to the OECD guidelines. **Results.** The percentage of parasite suppression on the crude extract was 31.02%, 35.82%, and 39.23% in prophylactic, curative, and 4-day suppressive tests, respectively, at the tested dose level of 400 mg/kg. The percentages of chemosuppression of the solvent fractions (400 mg/kg) were 43.07%, 42.61%, and 38.38% in aqueous, ethyl acetate, and chloroform fractions, respectively. Both the crude extract and solvent fractions also significantly prolonged survival time except in the prophylactic test. In addition, prevention of weight loss and reduction in temperature and packed cell volume (PCV) were observed in crude extract as well as solvent fractions. The acute toxicity test of the plant extract also exhibited no sign of toxicity. **Conclusion.** The result indicated that *Silene macrosolen* has a significant antimalarial activity, justifying the traditional use of the plant material for treatment of malaria.

1. Introduction

Malaria is a fatal infectious disease that has a large burden of disease [1]. Malaria infects 219 million people globally with annual death of almost half a million [2, 3]. Sub-Saharan African countries including Ethiopia are disproportionately affected by malaria morbidity and mortality, with the highest burden on children under five and pregnant women [3, 4].

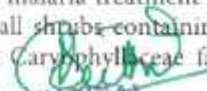
The rapidly evolving antimalarial drug resistance also poses a significant challenge in reducing the burden of malaria. Resistant parasites have been reported against all the available antimalarial medications [5, 6]. This indicates malaria may cause unprecedented morbidity and mortality

in the future, justifying the need for new antimalarial drug development [5, 7].

Plants have been an important source of drugs for many centuries [8]. According to the WHO report, about 80% of Asians and Africans still rely on herbal medicine to meet their primary health-care needs [9, 10]. Most of the currently available antimalarial drugs also have a plant origin [8, 11]. Therefore, plants are considered as a robust source for the event of future effective antimalarial agents. Ethiopia is rich in biodiversity, and the traditional medicinal plant has played a significant role in malaria treatment [1, 12, 13].

The genus *Silene* is small shrubs containing about 700 species that belong to the Caryophyllaceae family. It has




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Comparing the knowledge and awareness of cervical and breast cancer among medical and nonmedical students of a private institution in South India : Journal of Cancer Research and Therapeutics

Oct-Dec 2022 - Volume 18 - Issue 6

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Original Article

Designing and Synthesis of Some Transition Metal Complexes Derived from Schiff Bases for Anti-Bacterial Activity

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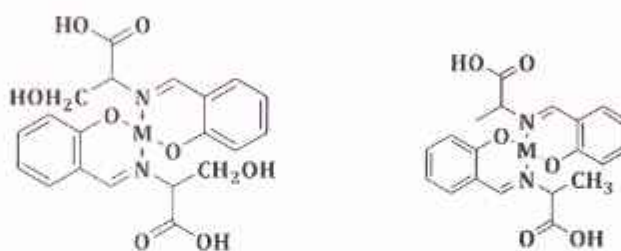
Inhibition

Polar solvents

ABSTRACT

Condensation of salicylaldehyde with D-alanine and L-serine was carried out to obtain Schiff bases and treated with various metal chlorides to form metal complex derivatives. The metals chlorides used for the preparation of metal complexes derivatives were copper, cobalt, iron, manganese, and zinc, respectively and characterized by elemental analysis, FT-IR, ¹H NMR, ¹³C NMR, and LC-MS. Hence, a total of ten metal complexes derivatives was synthesized and screened for some tested bacterium organisms like *Staphylococcus aureus*, *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Salmonella typhi*. The synthesized metal complexes derivatives showed significant activity compared with Schiff base and ciprofloxacin used as standard. The synthesized metal complexes derivatives showed a good effect on the selected antibacterial strains, indicating that the activity was depending on the structure of the compound. Amongst the selected five metals, cobalt showed the good antibacterial activity followed by other metals in dimethyl sulfoxide as a solvent. The Schiff bases synthesized also showed significant antibacterial activity.

GRAPHICAL ABSTRACT



M = Cu, Co, Fe, Zn, Mn

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Review article

Ground water fluoride induced neurological changes in brain: a promising review

Sathasivam Rajkumar¹, Swaminathan Gomathi^{2*}, Chinnadurai Kannan¹, Byran Gowramma², Ramanathan Sambathkumar¹

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ABSTRACT

Fluoride is now found in many sections of the world's groundwater. Across the globe, more than 25 countries have found evidence linking fluoride, a single ion, to health concerns. Although a highest limit of fluoride in groundwater has been set by the World Health Organization, it has been found to be exceeded in a number of nations. According to WHO estimates from 1984, more than 260 million people drank water with more than 1 mg/L of fluoride. Tamilnadu is one of the Indian states where fluoride contamination has been discovered. Several organs of the body, including the brain, have been found to be damaged by long-term fluoride exposure. Fluoride produces free radicals, increases lipid peroxidation, depletes antioxidants, inhibits essential enzymes in biochemical activities, lowers energy production, and restricts protein synthesis. The primary goal of this paper is to explain how fluoride might cause neurotoxicity in the brain.

Keywords: Fluoride, Oxidative Stress, Ground water, Neurotoxicity, Anti-oxidants

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JSS College of Pharmacy, Academy of Higher Education & Research, Ooty, Nilgiris, Tamilnadu, India.

INTRODUCTION

Groundwater is the most important resource for a wide range of purposes in many parts of the world. To use underground for consumption and other home needs, such as cooking, no physiochemical testing is necessary. There are numerous health issues that might result from a bad habit like this one. Although this method cannot be avoided in many sections of underdeveloped nations, a lack of clean piped water distribution infrastructure does not allow it. It is quite concerning when groundwater becomes unusable due to abnormally low or excessive concentrations of specific ions.^[1]

The much more electronegative of the halogens is fluorine. Several other elements must be present for fluoride to develop. Living organisms are exposed to fluoride through their consumption of food and water. Hydrogen fluoride, calcium fluoride, sulphur hexafluoride, sodium fluoride, and silico fluoride are the most major inorganic fluorides that threaten the ecosystem because of their composition. Air, top soil, and water all contain it. As a gas, fluorides are released into the atmosphere. It is possible to distribute fluorides over great distances by wind before they are deposited or diluted in water. Fluorides, apart from sulphur hexafluoride (SF₆), are generally incapable of surviving in the environment for lengthy periods of time.

The far more electronegative element and the major component of the halide complex are fluorine. Fluoride is formed

when it reacts with several other elements. The major source of fluoride exposure for living creatures is through their consumption of water and food. Hydrogen fluoride, calcium fluoride, sulphur hexafluoride, sodium fluoride, and silico fluoride are the most important inorganic fluorides that have harmful impacts on the ecosystem based on the composition emitted. It can be found in the air, top soil, and water. Fluorides are discharged into the atmosphere as a gas. Fluorides can be dispersed over long distances by wind before being deposited on the surface of the earth or diluted with water. Apart from sulphur hexafluoride (SF₆), which has a residual time in the atmospheric of several thousand years, fluorides are usually unable of persisting in the environment for a prolonged duration.^[2]

In over 25 nations, fluoride is associated to a wide range of health issues. Globally, fluoride levels in groundwater have been found to go beyond the World Health Organization's (WHO) permitted limit is 1.5 mg/L. In 1984, the WHO predicted that 260 million people all over the world were wasting water that contained and over 1 mg/L inorganic fluoride.^[2] Researchers from India, Iran, China, Pakistan, the Turkish Republic of South Africa (Southern Algeria), Sri Lanka, Japan, Kenya, Ghana, and Norway have all discovered increased fluoride concentration in underground water. An additional possible factor of fluoride consumption, in contrast to



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In silico Design, Synthesis and Antitubercular Activity of Some Metal Complexes Derived from Salicylaldehyde and Amino Acid

Author(s): Munusamy Jambulingam¹, Subramaniam Ananda Thangadurai² and Manickam VijayaBaskaran³

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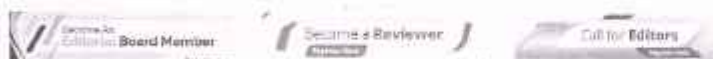
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Abstract

Background: A new series of copper (II), cobalt (II), zinc (II), manganese (II), and iron (II) metal complexes were synthesized by the condensation of a novel Schiff base with various metal chlorides in ethanol. Schiff base was synthesized by reacting salicylaldehyde with L-glutamic acid and L-tyrosine dissolved in ethanol, respectively.

Methods: The structures of all the synthesized metal complexes (4a-e, 7a-e) were investigated using elemental analysis, FT-IR, ¹H NMR, ¹³C NMR and MS spectral data. The metal complexes were also screened for their anti-bacterial, anti-fungal, and anti-tubercular activities against various tested strains.

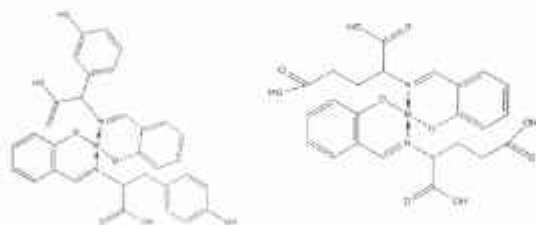
Results: Assessment of in silico ADMET properties of all metal complexes showed to be in accordance with Lipinski's rule of five. Further enzymatic assay was aided by a molecular docking study of Enoyl CoA reductase (ENR) using Autodock Vina and evaluated by Autodock 4.0.

Conclusion: The metal complexes, 4b, 4c, 4d, 7b and 7d, containing metals, like Zn, Co, and Fe, exhibited good anti-bacterial, anti-fungal and anti-tubercular activities against the tested strains.

Keywords: Metal complexes, antitubercular, anti-fungal, anti-stenococcal, Schiff bases, Enoyl CoA reductase.

Graphical Abstract

In silico Design, synthesis and Anti tubercular activity of some metal complex derived from salicylaldehyde and amino acid.



M = CuCl₂, ZnCl₂, CoCl₂, FeCl₂, MnCl₂

Metal complex derivatives containing copper and Zinc have potent Anti-tubercular activity.

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Review Article

A Review on Complications of Sleep Apnea

John David¹, Cindy Jose^{1*}, N. Venkateswaramurthy², R. Sambath Kumar²¹ Post Graduate Student, Department of Pharmacy Practice, J.K.K. Nattraja College of Pharmacy, Namakkal (Dt), Kumarapalayam- 638 183, Tamil Nadu, India¹ Assistant Professor, Department of Pharmacy Practice, J.K.K. Nattraja College of Pharmacy, Namakkal (Dt), Kumarapalayam- 638 183, Tamil Nadu, India² Professor and Head, Department of Pharmacy Practice, J.K.K. Nattraja College of Pharmacy, Namakkal (Dt), Kumarapalayam- 638 183, Tamil Nadu, India² Professor and Head, Department of Pharmaceutics, J.K.K. Nattraja College of Pharmacy, Namakkal (Dt), Kumarapalayam- 638 183, Tamil Nadu, India

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Sleep apnea occurs when the upper airway repeatedly becomes blocked during sleep, reducing or entirely blocking airflow. This is referred to as obstructive sleep apnea. If the brain fails to provide the necessary impulses for breathing, the disease is known as central sleep apnea. Sleep apnea and other sleep breathing problems are a leading cause of medical, social, and occupational disability. Sleep apnea is also linked to pulmonary hypertension, cardiac arrhythmia and other neurocognitive effects, majority of individuals with sleep apnea go undetected, putting them at danger during surgery. It is critical to identify these patients so that relevant steps can be implemented as soon as possible. In this review article, we will discuss about sleep apnea issues and their possible causes.

Keywords: Sleep apnea, Bradycardia, Tachycardia, Breathing, Hypercapnia

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Introduction

Sleep-disordered breathing refers to brief, frequently cyclical, cessations in breathing rhythm (apneas) or brief or continuous reductions in breath amplitude (hypopneas) that are severe enough to produce arterial hypoxemia and hypercapnia. These apneas and hypopneas are sleep-related and are accompanied by ¹ a compromised, often completely closed, extrathoracic upper airway ("obstructive" event); ² a significant reduction or cessation of brain stem respiratory motor output ("central" event); and a combination of central and obstructive events. These ventilatory deficiencies, together with the resulting occasional hypoxemia, frequently produce transitory arousals from sleep and sleep state fragmentation throughout the night and autonomic nervous system overcompensation. ³⁻⁵ The most common clinical symptoms are Loud snoring, choking/gasping, apneas observed by the bed partner, extreme tiredness and weariness, and a morning headache. The patient's and their family's quality of life is severely impacted by sleep apnea. Sleep apnea can have consequential health problems if it is not properly treated; it raises the risk of hypertension, type

2 diabetes, and cardiovascular disease. ⁵ Sleep apnea is also a well-known cause of cognitive impairment. ⁶

Sleep Apnea

Sleep apnea is a main sleep disorder marked by interruptions in breathing while sleeping. Obstructive sleep apnea (OSA), central sleep apnea (CSA), and complex sleep apnea are the three basic kinds of sleep apnea. Obstructive apnea is defined as a pause in airflow lasting at least 10 seconds caused by the collapse of the upper airway during sleep. In contrast, during a central apnea, airflow is interrupted when there is a lack of attempt to breathe, which usually originates from the brain respiratory centers to the muscles that govern breathing. Some people have a combination of obstructive and central apnea, which is known as complex sleep apnea ⁷

An Apnea-Hypopnea Index between 5 and 14 is considered mild sleep apnea, between 15 and 29 is termed moderate sleep apnea, and more than 30 episodes per hour is considered severe sleep apnea. Several sleep apnea screening measures have been created to detect at-risk patients. ⁸

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Review Article

A Review on Guillain Barre Syndrome and its Association with COVID 19

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Abstract

Guillain-Barre syndrome (GBS) is an immune-mediated disease that affects peripheral nerves and can lead to life-threatening consequences. It affects around 10000 people per year worldwide. Since the outbreak of acute respiratory syndrome coronavirus-2 (sar-cov-2) the incidence of GBS has been increased with a fatality rate of 4-7%. The exact association between the Sar-cov-2 and GBS is still unknown. GBS commonly presents after viral infections such as influenza virus, campylobacter jejuni, and zika virus. Clinical recognition of SC2-GBS is required in order to administer appropriate treatment on time and enhance the overall output of the infection. In most of the conditions patient was treated with intravenous immunoglobulins and outcome was seen within eight weeks of treatment, less outcome was seen in older age in line with previous findings for both GBS and COVID-19. Studies should be conducted to compare patients associated with GBS to those with concurrent non-COVID-19 GBS to see if the incidence of GBS is higher in those with COVID-19.

Keywords: Guillain-Barre syndrome; COVID-19, SAR-COV2.

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INTRODUCTION

Coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory distress syndrome coronavirus 2(SARS-CoV-2) and was declared as a pandemic by world health organisation in march 2020. ^{1,2} Coronaviruses can cause a variety of systemic infections, the most significant of which are respiratory complications, which are similar to severe acute respiratory syndrome coronavirus (SARS-CoV). Fever, cough, dyspnoea, myalgia, headache, and diarrhoea are the most common symptoms at the onset of disease after an incubation period of approximately 5.2 days and the symptoms of COVID-19 are dependent on the age and the patient's underlying medical illness and also the condition of the immune system. ^{3,4}

During the covid pandemic neurological complications has been established in those patient who were having severe infections. Guillain Barre Syndrome emerged as potentially serious complication among them and some other complications that include Bell's palsy, seizures, meningoencephalitis, cerebrovascular accidents, acute flaccid myelitis). ⁵ Around 70% of patients with GBS had an illness before developing GBS. Infectious agents such as Campylobacter jejuni, Influenza virus, Cytomegalovirus and

more recently Zika virus have been shown to trigger GBS in laboratory tests. ⁶⁻⁹

GBS is an intense immune-mediated illness affecting the peripheral nerves and nerve roots and is typically accompanied by a lung or gastrointestinal infection. It causes ascending symmetrical limb weakness and paresthesia, as well as areflexia or hyporeflexia and diminished or absent deep tendon reflexes, with or without involvement of the ventilatory and cranial nerves, are the hallmark clinical signs of GBS, which can last anywhere from a few days to several weeks. ^{10,11} Majority of the patients report air duct or gastrointestinal infection are mainly reported within 2-4 week before the inception of GBS neurological symptoms. ¹² GBS is usually caused by a viral or bacterial infection. Because of the antigen's structural similarities to axons and myelin, it stimulates the immune system and causes injury to the nerve roots and peripheral nerves. ¹³ GBS has a number of subtypes such as the basic type (acute inflammatory demyelinating neuropathy, or AIDP) and the subtypes AMAN (acute motor and axonal neuropathy) and AMSAN (acute motor and sensory axonal neuropathy), Miller-Fisher syndrome (MFS), polyneuritis cranialis (PNC), and the Pharyngeal-cervical-brachial (PCB) variant (Bickerstaff encephalitis) (BFE). GBS is typically diagnosed using the



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Article Detail

Assessment of Knowledge Attitude and Practice (KAP) Towards Covid-19: How Well the Health Care Workers are into Covid-19 in Kerala

Author: ASWIN SARATH, JOHN DAVID, K.KRISHNAVENI, R.SAMBATH KUMAR

Abstract: Background Coronavirus Disease 2019 (COVID-19) has been designated a worldwide public health emergency, impacting individuals all over the world. Objectives The goal of this study was to evaluate health care workers Awareness, Attitudes and Practices (KAP) regarding the 2019 Coronavirus Disease (COVID-19) pandemic in Kerala. Methods A cross-sectional study was carried out among health care workers (n=355) in Kerala over 5 months. The questionnaire was divided into 5 parts, part 1 demographic information, and next 3 parts evaluated knowledge (10 questions), attitude, (10 questions) and practice (8 questions). Part 5 obtained access to health care workers' mental well-being. The data was subjected to Chi-square analysis and Pearson's correlation, 95% confidence interval (CI) was calculated and p<0.05 was recognized statistically significant. Results A total of 385 HCWs (response rate: 88.73 %) completed the survey out of 437 participants. 72 % (n=127) were female, 40.36 % (n=157) were aged 31-40 years, and most were nurses (n=258, 66.49 %). A large percentage of HCWs had strong Knowledge, positive Attitude and good Practice towards COVID-19. Participants Demographic were not correlated with knowledge attitude and practice level towards Covid-19 but Pearson analysis indicated that there is a positive correlation between knowledge and attitude (p<0.014). Conclusions, The HCWs of Kerala have excellent Knowledge, Attitude and Practice towards COVID-19. It is suggest that government and Health Care department should conduct regular seminars and practice sessions regarding COVID-19 which would empower the HCWs against COVID-19.

Keyword: Health Care Workers, COVID-19, pandemic.

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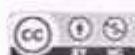
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Review Article

Assistance of Gut Microbiota in Depression

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The association between gut microbiota and mental health is a relatively new research topic that has gained traction in recent years. Depression is a serious mental illness and a leading cause of disability, morbidity, and mortality worldwide. Based on the WHO reports, there are approximately 350 million people affected by depression globally. Currently available treatments can temporarily alleviate the symptoms of depressive illness, but these management plans are unable to completely reverse the multifactorial pathology of depression, and the antidepressant medications may produce side effects and adverse drug reactions which may turn down the quality of life of patients. Research has shown that the gut microflora interacts with the brain through various mechanisms, and this leads to the recognition of the microbiome in managing mental health. By unveiling the complexities involved in this area can help to develop novel strategies to treat the depressed patients and to prevent the public from falling to depressive disorder.

Keywords: Gut microbiome, depression, neurotransmitters

INTRODUCTION:

The symbiotic association between gut microbes and humans has always piqued the interest of scientists since it provides insight into the genesis of numerous diseases. The gut ecosystem has evolved to contain a diverse population of microorganisms including yeasts, archaea, parasites, helminths, viruses, and protozoa, but the bacterial population is currently the most well characterized. The composition of the bacteria that inhabit our GI tract throughout our adult life is established early in our first few years of life and at this early-life stage they are particularly sensitive to manipulation by a number of environmental factors including mode of delivery (vaginal or C-section), whether we are breastfed or bottle-fed, diet, medication (in particular antibiotic medication), and exposure to viral or bacterial infections and stress and eventually leads to mood disorders like anxiety and depression with progressing age^[1]. In humans, gut microbes play an important role in nutrition (the breakdown of indigestible polysaccharides and the synthesis of vitamins), defense against dangerous pathogens, metabolism, physiology, and immunological function^[2,3]. Individual genetics, growth and development, and geographic location all influ-

ence the composition of one's gut microbiota^[4]. Dysbiosis and gut inflammation have been linked to numerous mental illnesses, including anxiety and depression, both of which are prevalent today^[5]. Depression is a widespread mood disorder that affects over 264 million people globally^[6]. Severe depressive symptoms were associated with higher rates of chronic disease, increased health-care consumption, and serious difficulties at work, at home, and in social activities^[7].

The central nervous system (CNS), both brain and spinal cord, the autonomic nervous system (ANS), the enteric nervous system (ENS), and the hypothalamic pituitary adrenal (HPA) axis are all part of the complex bidirectional gut brain axis (GBA). Microbiota can interact with GBA through various mechanism. Environmental influences, such as emotion or stress, can stimulate the CNS and, in particular, the HPA axis. HPA is finalized to release cortisol and is triggered by a complicated interaction between the limbic system's amygdala (AMG), hippocampus (HIP), and hypothalamus (HYP). Corticotropin-releasing factor (CRF) secretion from the hypothalamus drives adrenocorticotropic hormone (ACTH) secretion from the pituitary gland, which leads to cortisol



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RESEARCH ARTICLE

Bacteriology of wound infections and Antibiotic susceptibility pattern of the Isolates

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ABSTRACT:

Wound infection has always been a major complication of surgery and trauma. The aim of our study was to determine the bacteriology of wound infections and to study the antibiotic susceptibility pattern of the isolates. The study was conducted in tertiary care hospital, Erode. The design of the study was a prospective type. Pus swabs / specimens were collected from hospitalized patients who developed wound infections. Bacterial pathogens were identified by conventional biochemical methods according to standard microbiological techniques. Antimicrobial susceptibility was performed on Muller – Hinton agar by the standard disk diffusion method. The incidence of wound infection was more common in males (63%) than in females (37%). Out of 100 culture positive samples, 61 samples were collected from diabetic ulcer patients, 20 samples were from ulcer patients, and 19 samples were from post operative patients. Of the 100 samples (culture positive), 71% collected samples showed mono-microbial growth, 29% showed two type of microbial growth. The prevalence of *S. aureus* (62.87%) from different wound infections was found to be high, followed by *E.coli* (48.65%), *Klebsiella* (30.21%), *Pseudomonas* (22.16%). Organisms showed diversity in the sensitivity pattern towards the antibiotics tested. High level of sensitivity was observed to Imipenem, Piperacillin tazobactam and Amikacin. High level of resistance was observed to Cephalosporins and Penicillin derivatives. We concluded that the sensitivity pattern of the antibiotics is not based on the infection site but on the type of organisms. This study gives us an insight to the current state of causative pathogens and their sensitivity to different antibiotics used in tertiary care hospital, Erode. The data of this study may be used to determine trends in antimicrobial susceptibilities and to modify antibiotic policy of the Hospital.

KEYWORDS: Empirical therapy, antimicrobial sensitivity, resistance, bacteriology, wound.

INTRODUCTION:

Wound infection has always been a major complication of surgery and trauma. Despite current pre-operative preparation, operative technique, and antibiotic prophylaxis, post-operative wound infections remain a serious problem¹. Surgical infections are the third most commonly reported nosocomial infections and they represent around 25% of all nosocomial infections²⁻⁵.

Diabetic foot ulcer and surgical site infections have a long-term impact on increasing treatment cost, morbidity, and mortality. The pathogens isolated from wounds may vary depending upon the core problem, infection site location, and type of surgical strategy. Antimicrobial medicines play a major role in the treatment of wound infections. However, their extensive use, often overuse, and abuse increases the resistance to their efficacy. Therefore, one of the key challenges facing countries is to make sure the best use of antibiotics. Antimicrobial resistance patterns are continually evolving, and multidrug-resistant organisms undergo progressive antimicrobial resistance,

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Fungal Resistance – An Overview

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Abstract:

The widespread uses of triazoles in the early 1990s. Resistance are in both *Candida* and *Aspergillus* species has become a global problem. Reports of non-*Candida* species are been resistant to azoles and to the multidrug-resistant *Candida* species, such as the *Candida glabrata* or, lately, *Candida auris*, these are all increasing with the alarming frequency. Diagnosis of candidiasis has been usually based on the isolation of growing fungus in the blood cultures or tissue biopsy specimens. The sensitivity of the blood cultures for detecting the candidiasis is low, so several days have been required for the development. The usage of molecular beacon probes from reverse-transcribed mRNA of important drug-resistance genes such as ERG11, MDR1, CDR1, and CDR2 has been realised as a nucleic-based detection approach for antifungal resistance in *Candida* species. Current antifungal treatments are very much limited in their capacity to treat infections, especially in those systemic infections and also no advancements in antifungal therapies were developed recently. The researchers are working to understand the biology of fungal microorganisms *in vitro* and *in vivo*. Novel therapeutics based on this interaction could be employed alone or in conjunction with existing antifungal medications. There are various types of pathogenic fungi that have reduced susceptibility to antifungal drugs or have outright resistance to them. Several new antifungals are now being developed, which will be more beneficial than current medications in terms of overcoming antifungal resistance as well as avoiding side effects and drug interactions associated with currently available agents.

Key Words: Antifungal, *Candida*, Global problem, Resistance.

1. INTRODUCTION:

The skin is the body's outermost layer and the integumentary system's largest organ because it would interface with the environment and also it plays an important role in the protection of the body against the pathogens and also in other environmental conditions. Now-a-days skin diseases are very common among the people, normally 10-15% of the general practioner are work is with the skin disease and it is the second most common cause of loss of performance.^[1]

Among the Immunocompromised individual fungal infections are termed to be the major problem.^[2] These are all superficial and it can also turn into systemic infections as the disease incidence prolongs.^[3] Among the different mycotic infections caused by these opportunistic fungi, candidiasis, infections caused by *Candida* would be the life threatening due to its higher worldwide phenomenon.^[4]

Polyenes (amphotericin B), azoles (fluconazole, itraconazole, posaconazole, voriconazole, and isavuconazole), echinocandins (caspofungin, micafungin, and anidulafungin), allylamines (terbinafine), and antimetabolites (flucytosine) are the five major classes of antifungal drugs now in use.^[5] Polyene achieve the fungicidal activity by binding to the ergosterol in cell membrane, it would be resulted in the increased permeability and leakage of intracellular components is also a problem., which would be subsequently lead to the cell death also. Similar to these polyenes azoles also targets the ergosterol to achieve the fungicidal activity,^[6] by blocking the enzyme lanosterol14-demethylase, they selectively inhibit ergosterol production. Azole's are been the first one that try to potent fungicidal activity and also a broad spectrum of coverage. In addition to the ergosterol the other potent antifungal target is 1, 3-β-d-

glucan, an important component of fungal cell walls. Echinocandins inhibit 1,3-β-d-glucan synthesis to weaken fungal cell walls and trigger cell lysis. Allylamines interfere with ergosterol synthesis by the inhibition of squalene epoxidase. Terbinafine is a topical antifungal drug that is extensively used in the treatment of dermatophytes and moulds in the salvage context, because to its efficacy and lower adverse effect profile than other antifungal agents.^[7] Flucytosine, the final drug of therapeutic significance, is a pyrimidine analogue that acts by selectively interfering with fungal nucleic acid synthesis.^[8] However, because of the quick development of resistance, monotherapy is rarely used, and it is mostly used as part of a combination therapy for cryptococcal meningitis, urinary candidiasis, or chromoblastomycosis management.

Antifungal resistance is an evolutionary system primarily based totally on herbal choice of organisms that enhance their capacity to continue to exist and develop withinside the presence of drug. The evolution of resistance in opposition to antimicrobial sellers is ubiquitous in nature and microbes evolve diverse techniques to fight the movement of drugs.^[9]

In the tough treatment condition, the prevalence of drug-resistant fungal infections is increasing, which is aggravating. Many of the fungal infections are been having the treatability issues such as the toxicity which is especially for the patients with the other underlying infections (e.g. HIV). *Candida auris*, a drug-resistant *Candida* species, is one of the most common causes of invasive fungal infections, with rising resistance to fluconazole, amphotericin B, and voriconazole, as well as emerging caspofungin resistance.^[10]


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How does Heparan Sulfate and COVID-19 Work?: An Overview

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Abstract

Globally, the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) had infected over 3 million individuals and claimed many lives producing a global epidemic that necessitates the rapid development of therapeutic solutions. The ideal technique for quickly deploying well-characterized medicines against novel infections is known as drug repurposing. Several repurposable medicines are currently being tested to see if they may be used to treat COVID-19. Heparin, which is commonly utilized to reduce thrombotic events associated with COVID-19-induced disease, is one such promising drug. Heparansulphate is prevalently expressed in mammalian tissues. CoV-2 requires the helping cofactor heparansulphate (HS) on the cell surface: knocking down genes related in HS formation or treating cells with an HS mimic both prevent spike-mediated viral entrance. Heparin/HS binds directly to spike and promotes viral entrance by facilitating the attachment of spike-bearing viral particles to the cell surface. As documented with cell surface-bound heparansulphate, heparin binding to the open conformation of the spike structurally supports the state and may enhance ACE2 binding. Thus, heparansulphate could potentially be utilised to prevent SARS-CoV-2 transmission, based on available datas also consumption of heparansulphate during SARS-CoV-2 cellular entrance may play a role in the thrombotic events associated with COVID-19 infection. Furthermore, this study provides the findings on the mechanism(s) by which heparansulphate could slow the progression of SARS-CoV-2 infection.

Keywords: COVID-19, HeparanSulphate, Spike Proteins

INTRODUCTION:

COVID-19 (SARS CoV2), a lethal virus that causes severe acute respiratory syndrome (ARDS) and hospital pneumonitis, is currently sweeping the globe. The virus was first discovered in a series of cases in Wuhan, China, and the World Health Organization (WHO) termed it the coronavirus disease 2019 (COVID-19) pandemic due to its rapid spread^{1,2}. The SARS-CoV-2 pandemic necessitates the development of therapeutic strategies shortly. COVID-19 patients have clotting problems, which have a negative impact on the disease's prognosis and lead to greater fatality rates³⁻⁵. Abnormal coagulation indicators, especially notably raised d-dimer, fibrin degradation product (FDP), extended prothrombin time, and thrombocytopenia, have been found in severe COVID-19 patients and non-survivors in numerous studies^{6,7}. Overt disseminated intravascular coagulation (DIC) is more common in patients infected with this coronavirus^{7,8}. The Heparansulphate proteoglycan (HSPG) and Heparanase system is one of the probable systems that may play a key role in the excessive coagulation that characterises COVID-19¹.

The binding of a viral protein to the cell surface heparansulphate (HS) is usually the first of several interactions that lead to viral entry and infection. Selectins and cytokines (e.g., IL-6 and TNF-) interact with HS expressed on endothelial cells to limit immune cell recruitment during inflammation, on the other hand⁹. Endothelial barrier function is required for the regulation of fluid and protein extravasation, particularly in the lungs and kidneys¹⁰. Endothelial cell dysfunction appears to have a key part in the pathogenesis of COVID-19 issues, according to several studies^{11,12}.

The glycocalyx is a thick layer of negatively charged glycosaminoglycans (GAGs) that covers endothelial cells. Heparansulphate (HS) is the most frequent sulfated GAG in the glycocalyx. HS contributes to the endothelium's charge-dependent barrier function due to its negative charge¹³. Heparanase (HPSE), the only known mammalian HS degrading enzyme, degrades the endothelium glycocalyx, causing endothelial barrier function to be lost, as shown in ARDS and proteinuric renal diseases^{14,15}. In addition to altering barrier function, HPSE forms a pro-inflammatory



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Review Article

Menopause Induced Depression, Anxiety, Quality of Life, Lack of Sleep in Women: An Overview

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Background: Menopause occurs between the ages of 40 and 50, and marks the end of a woman's menstrual cycle. A period of time during which a woman does not have a monthly cycle for more than 12 months is known as post-menopause. Women may suffer challenges in their daily lives during this period, such as depression, anxiety, and sleep loss, all of which can have a negative impact on their quality of life. A decrease in hormone production, such as estrogen and progesterone, can cause menopause. To treat psychological difficulties in menopausal women, drugs such as vortioxetine and paroxetine, as well as selective serotonin reuptake inhibitors (SSRI) and anti-depressants, were advised.

Objective: To evaluate the effects in women how menopause inducing depression, anxiety, quality of life and lack of sleep.

Methodology: The recent studies related to the aim of the review were undertaken through a literature search to evaluate the effects in women how menopause inducing depression, anxiety, quality of life and lack of sleep.

Conclusion: Menopause, post-menopause, and peri-menopause are age-related causes in women who are going through the menstrual cycle. There is no need for medication during this time, but in severe cases, medications such as selective serotonin reuptake inhibitors (SSRI) and antidepressants should be administered and also for vaginal dryness and irritation Ospemifene is suggested. Many more clinical researches on the benefits of menopausal complications will be needed in the future.

Keywords: Menopause, post-menopause, depression, estrogen, progesterone

INTRODUCTION:

Menopause is a life stage in which a woman experiences physical, psychological, and social changes, all of which have an impact on her quality of life. More than 25 million women worldwide experienced menopause in the 1990s, and this number is predicted to triple by 2020 and beyond¹. Post-menopause is a period of time that begins about 12 months following a woman's last menstrual period and is marked by a certain sex hormone profile². By 2030, it is anticipated that 1.2 billion women will be postmenopausal, amounting to 47 million women every year^{1, 4}. The reduction in female hormone production by the ovaries causes the transition from the reproductive to the non-reproductive stage. Although menopause is a physiologically related ailment, it is clear that the resulting physical and emotional changes have a significant impact on women's lives.

Depression, anxiety, poor quality of life, and sleep deprivation are all common health problems among women in their forties and fifties. An Australian study indicated that women in the peri-menopausal and postmenopausal phases had a higher risk of more severe depressive symptoms than women in the premenopausal period without a history of depression⁵⁻⁹. Depression causes inflammation and suppresses proper immunological responses. Depression

affects a person's mental and physical health^{10,11}, as well as their quality of life (QoL)^{12, 13}. Depression is connected to a host of functional difficulties as well as significant decreases in a variety of QoL categories; including social functioning.¹⁴ Sadness and anxiety are more common in women in their peri-menopausal and postmenopausal periods⁷. Depressive disorders are also on the rise at an alarming rate. Women have around double the lifetime risk of major depression as men, with about 5% of women experiencing major depression, and depression is expected to be the world's second leading cause of disability by 2020.¹⁵ Higher rates of depression and obesity, according to studies, lower quality of life and raise the risk of illness and early death^{16, 17}.

Antidepressants' efficacy on anxiety and depressive symptoms, as well as vasomotor and cognitive symptoms, especially Selective Serotonin Reuptake Inhibitors (SSRIs) and Serotonin and Norepinephrine Reuptake Inhibitors (SNRIs). In the menopausal phase, the development of depression and anxiety symptoms is typically 1.8 and 2.0 times higher than in the premenopausal period¹⁸.¹⁸ Depression and anxiety symptoms affect 18 percent to 41.8 percent of perimenopausal and postmenopausal women, respectively and 7 percent to 25% of postmenopausal women¹⁷⁻²². Estrogen's neuromodulator of the serotonergic and noradrenergic systems as a source of

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Review Article

Misuse of Antibiotic during COVID 19 Outbreaks

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The COVID-19 outbreak, caused by the severe acute respiratory syndrome coronavirus 2, has been detected in December 2019 in Wuhan, China, and is accompanied by significant degrees of morbidity and mortality. Antibiotic resistance (AMR) threatens to wreak havoc on healthcare system and the impact of globalization, and COVID-19 is intended to keep it at bay for the time being. During the COVID-19 crisis, a wide range of antimicrobial medicines were promoted as viable treatments. While both industrialized and industrializing nations have seen a rise in antimicrobial medication usage, use and abuse have been significantly more prevalent in developing countries. Antibiotic resistance is still a concern since microorganisms that cause resistant infections develop in hospitals and medical institutions, placing all patients at risk, complicating the care of COVID-19. Improper prescriptions, a lack of care management policies and needless self-administration by the general population are examples of these. Antibiotics seem to be more motivated to abuse and misusing antibiotics than to keep them safe and take them only when prescribed. Almost all of the substantial antibiotic usage in COVID-19 patients is inevitable. Patients having lung viral infections are more likely to develop subsequent bacterial infections, which lead to higher disease severity and death. Immediately crucial components of any AMR mitigation approach are increased spending in education and increased public knowledge of AMR. More studies are needed to better understand the health risks and rate of co-infection in COVID-19 patients in order to promote a decrease in any unnecessary antimicrobial prescribing.

Keywords: COVID-19; Antibiotic use and misuse; Antimicrobial Resistance.

INTRODUCTION:

Coronaviruses (CoVs) have been linked to severe disease outbreaks in East Asia and the Middle East during the last two decades. The Middle East respiratory syndrome (MERS) and the severe acute respiratory syndrome (SARS) first appeared in 2002 and 2012, respectively. In late 2019, a new coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19), appeared, posing a worldwide health hazard and generating an ongoing pandemic in numerous nations and territories¹. The World Health Organization (WHO) has named the current CoV-related disease COVID-19, which is caused by SARS-CoV-2. The main cluster of diseases has been shown to be linked to Wuhan's Huanan South Chinese seafood market². The corona virus, which belongs to the corona virus family, is primarily responsible for the illness. These members of the family are single-stranded, positively sensitive RNA viruses that cause mild respiratory infections in humans. However, in some circumstances, they can cause major difficulties in the central nervous system, gastrointestinal tract, and respiratory system³⁻⁵. This hidden antimicrobial resistance (AMR), which is

aggravated by antibiotics. There is no such thing as a vacuum when it comes to the discovery of novel therapeutic antibiotics^{6,7}. Immunocompromised patients who have already been infected with a respiratory infection, such as TB, influenza, acute respiratory syndrome (SARS), or presently covid-19, are at a higher risk of getting serious illnesses⁷. The spread of SARS-CoV-2 is quite troubling because it has the potential to be very severe in low- and middle-income nations (LMICs), Antibiotics help lower morbidity and death linked with infectious illnesses in underdeveloped nations where health remains poor^{8,9}. As the globe responds to COVID-19, a major underlying threat of antimicrobial resistance (AMR) lurks. It was already killing hundreds of thousands of people worldwide at the time (approximately 700 000 deaths per year). The widespread and inappropriate use of antibiotics, among other factors, aided in the formation and dissemination of anti-pathogens¹⁰⁻¹². Unfortunately, microorganisms developed resistance to existing antibiotics within a few years after their introduction. Fungus has generated an equivalent level of resistance¹³. There has been a lack of systematic measures to minimize AMR, resulting in millions of fatalities worldwide and on a yearly basis AMR has the potential to become a



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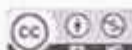
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Review Article

Review on Kalemic Conditions in Pregnancy

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Hypokalemia and hyperkalemia, are common electrolyte diseases related to changes in potassium intake, excretion, or transcellular shifts. Hypokalemia is commonly induced by diuretics and gastrointestinal losses, whereas hyperkalemia is typically caused by kidney disease, hyperglycemia, and pharmaceutical use. The aetiology of kalemia can range from minor to severe, and it can be caused by diet, drugs, or another disease. Symptoms of hypokalemia include sinus bradycardia, ventricular tachycardia or fibrillation and acute muscle weakness, gestational hypertension, adrenal insufficiency, and renal failure are the symptoms associated with hyperkalemia. Chronic kidney disease and intrauterine fetal death are life-threatening complications associated with hypokalemia or increase potassium excretion for hyperkalemia. This review gives an insight into the causes, symptoms, complications as well as pharmacological and non-pharmacological treatments of Kalemic conditions in pregnancy. This review also reported some cases of hypo and hyperkalemia in pregnancy in both human and animals.

Keywords: Hypokalemia, Hyperkalemia, Pregnancy, Potassium.

INTRODUCTION

Women in the reproductive age range can develop general muscular weakness and fatigue even though they are quite normal during pregnancy, sometimes it may emerge due to hyper & hypokalemia. Distributions of potassium [k⁺] were in accordance with the distribution of water in the body. Total body water was assessed to be disbursed in two important compartments: two-third in intracellular [k_i] and one-third in extracellular [k_e] which is the major extracellular cation. The normal k⁺ concentration in the body was estimated to be 3.5 to 5.0 mmol/L. Even though 2% of total body k⁺ is posted k_e, small modification in extracellular potassium has an important impact upon the ratio of k_i/k_e as well as on membrane potential.^{1, 2}

Potassium is essential to control water and mineral equivalence all over the body. High levels can also disturb the equivalence of other minerals in the body and cause muscle problems throughout the body. It can also affect the heart's ability to function properly. Potassium disorders are common and it may result in life threatening cardiac conditions and neuromuscular dysfunction. Hypokalemia and hyperkalemia be the prevalent electrolyte disorders caused by change in k⁺ intake, altered excretion or cellular shift.³

Pregnancy offers the fetus, the advantage of a controlled environment during a critical period of growth and

development.⁴ The control is provided primarily by the homeostatic mechanism. The present studies mainly concentrate on the effects of potassium and sodium deficiencies.⁵ Preeclampsia, a pregnancy specific syndrome is the leading cause of maternal and fetal morbidity or mortality. Electrolyte like calcium [ca²⁺], magnesium [mg²⁺], sodium [Na⁺] and potassium illustrate a significant role in preeclampsia.⁶ Potassium deficient diets results in hypokalemia appeared at the end of pregnancy.⁷ In present, many cases of hypokalemia developed in pregnancy as a results of persistent vomiting has been reported.⁸

DATA SOURCE AND SEARCH STRATEGY

The databases such as PUBMED, SCOPUS, ELSEVIER, EMBASE, etc. were explored by utilizing the appropriate Medical Subject Headings (MeSH) terms, including all subheadings, and this was integrated with a keyword search. Searchword comprehended 'nausea and vomiting', 'vomiting', 'nausea', 'hyperemesis', 'morning sickness', 'antiemetic agent', 'fluids' and 'hydration' and 70 articles were obtained from the databases. From 70 articles 45 articles met the criteria and assessed, other 25 articles were excluded as it consist of the complications present in pregnancy other than kalemic conditions. After that, they were extracted the contents and a review was prepared on kalemic condition in pregnancy.


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Review Article

The New Outlook of Monoclonal Antibodies in Neutralizing Target Cells in COVID-19

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Abstract

Background: The deadly arrival of novel coronavirus (COVID-19) in late December 2019, caused by the Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2) has emerged worldwide causing a pandemic. The World Health Organization (WHO) has proved ineffectiveness against existing medications this influenced the prompt identification of Monoclonal antibodies (mAbs) which plays a vital role as the prophylactic application that helps in developing new interventions.

Objectives: To study the effect of mAbs in high-risk individuals in treating COVID-19.

Methodology: The recent studies related to the aim of the review were undertaken through a literature search to analyze the importance of mAbs in combating SARS-CoV-2.

Results: In several countries even though vaccines have reached the Emergency Use Authorization (EUA) people still rely on traditional medications. Besides repurposed drugs, recently many mAbs targeting S-protein of SARS-CoV-2 have been signed up for clinical trials. Currently, no specific neutralizing mAbs have been reported for SARS-CoV-2 and it may take several years for such antibodies to be readily available. The development of mAbs for preventing the SARS-CoV-2 infection is challenged by the threat of antibody-dependent enhancement, antibody-resistant against SARS-CoV-2 variants, acute respiratory infections, clinical trials and risk assessment, and inexplicable. The clinical trial data proved that there is no life-threatening Adverse Drug Reactions (ADR) occurred during mAbs therapy for COVID-19 patients.

Conclusion: Establishing monoclonal antibodies will continue to be the best prophylactic application as it minimizes the risk of hospitalization in the high-risk individuals affected by SARS-CoV-2 infection.

Keywords: COVID-19, Monoclonal antibodies (mAbs), Emergency Use Authorization (EUA), Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2)

1. INTRODUCTION

Passive immunization

Passive immunization also called passive immunotherapy or passive immunity that allows the transfer of antibody-mediated immunity to high-risk individuals for preventing the patients from unresponsive state or treating life-threatening illnesses ¹. Maternal antibodies (MatAb) also known as the natural form of passive immunity are transferred to the fetus via the placental receptor (FcRn) cells at the time of pregnancy whereas, Artificial acquired passive immunity can be delivered through many different forms such as human or animal blood products, immunoglobulins (IG), and monoclonal antibodies (mAbs) ². The immunological intervention was developed many years back for treating diphtheria and tetanus, which was derived from the serum of actively immunized animals ^{3,4}. At present, the passive immunization includes mAbs or polyclonal antibodies (pAbs) which were established from both human and non-human blood samples. The pAbs extracted from non-human origin were associated with

an increased risk of 'serum sickness' where these risks can be minimized by effective convalescent plasma therapy (CPT) or mAbs isolated from the human subjects ^{5,6}.

Development of monoclonal antibodies

Monoclonal antibodies are molecules defined as the body's natural immune system enhancer were evolved from exposing a white blood cell (WBC) to the viral host cell target protein, which was later cloned and developed into antibodies for combating severe infections ⁷. The mAbs were manufactured by operating the hybridoma technology, which was the first approved antibody for preventing kidney transplant rejection in 1986. Beyond binding to their targeted antigenic epitope mAbs produces multiple effects like the destruction of functional antigen and removal of cells and pathogens ⁸. Even though mAbs are restricted to single epitope specificity it is superior to polyclonal antibodies with multiple epitope specificities because they can be manufactured from large scale industries, with increased consistency ^{9,10}.

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Review Article

Will Mesenchymal Stem Cell Therapy Be Effective In COVID-19?

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Abstract

Background: The World Health Organization (WHO) reports that the outbreak of the deadly virus had been noted almost in all the countries worldwide. Newly no standard therapies are available to combat the situation and this remains the major challenge for healthcare professionals to provide effective treatment against the life-threatening condition. A potential regenerative medicine method using the infusion of stem cells for the treatment of lung disorders has been reported. This review attempted to explore the immunomodulatory characteristics of Mesenchymal Stem Cells (MSCs) and how these properties make them beneficial for the treatment of Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2) patients.

Objectives: To study the effect of Mesenchymal Stem Cell therapy in treating COVID-19.

Methodology: A literature search was conducted to identify recent research relating to the review's goal of analyzing the relevance of stem cells in battling SARS-CoV-2.

Results: The MSCs settle in the lungs intravenously to enhance the pulmonary microenvironment, minimize immune system over-activation, and encourage regeneration of damaged lung tissues. Its therapeutic properties like immune response inhibition play a major role in combating viruses. The avoidance of cytokine storm is the most important stage in COVID-19 therapy. Their potent immunomodulatory properties have positive effects in avoiding or attenuating the cytokine storm and assisting in the regeneration of injured lung tissues/other organs.

Conclusion: Intravenous human Umbilical Cord-Mesenchymal Stem Cell therapy (hUC-MSC) transplantation is a safe and effective technique that may be used as a restoration and prioritized therapeutic option for treating severe COVID-19.

Keywords: Covid-19, human Umbilical Cord-Mesenchymal Stem Cell therapy (huc-msc), Immune system.

INTRODUCTION

In late December 2019, the first cases of pneumonia with an unknown origin were reported in Wuhan, China¹. The pathogen was identified as a novel coronavirus that has a similar molecular structure to SARS-CoV-2². Since then, not only in China but throughout the world, the number of COVID-19 patients has risen dramatically. Coronaviruses (CoVs) are part of the Orthocoronavirinae subfamily of the Coronaviridae family of the Order Nidovirales. The Orthocoronavirinae subfamily is subdivided into four genera those includes Alphacoronavirus (-CoV), Betacoronavirus (-CoV), Gammacoronavirus (-CoV), and Deltacoronavirus (-CoV)^{3, 4}. The World Health Organization reports that the outbreak of the deadly virus had been noted almost in all the countries worldwide. Newly no standard therapies are available to combat the situation and this remains the major challenge for healthcare professionals to provide effective treatment against the life-threatening condition. As a result, concerted efforts are required to develop safe and effective COVID-19 therapies, particularly for severe instances. A potential regenerative medicine method using the infusion of stem cells for the treatment of lung disorders has been

reported⁵⁻⁷. The recent study finds that infusing stem cells in the affected individuals showed promising results as the stem cells with their cytoprotective and pro-antigenic properties remain as an advanced treatment strategy in severe lung diseases to overcome this pandemic period⁸⁻¹¹. This review attempted to explore the immunomodulatory characteristics of MSCs and how these properties make them beneficial for the treatment of SARS-CoV-2 patients.

1. METHODOLOGY

A literature search was conducted via online search through PubMed, Embase, and various resources with the help of keywords to identify recent research relating to the review's goal of analyzing the relevance of stem cells in battling SARS-CoV-2.

2. RESULTS AND DISCUSSION

NEW TREATMENT APPROACH INVOLVED IN COVID-19

2.1 Nanotechnology-Based Treatment Techniques

COVID-19 treatments rely heavily on nanotechnology¹². The effectiveness of nanotechnology in SARS CoV-2 treatments is

