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RESEARCH PAPER

Formulation Development and Characterization of Vancomycin Hydrochloride Colon-Targeted Tablets Using *In-Situ* Polyelectrolyte Complexation Technique

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ABSTRACT

Introduction: Vancomycin hydrochloride (VH) is an amphoteric glycopeptide antibiotic used to manage enterocolitis and pseudomembranous colitis. However, VH is prone to proteolytic degradation in the stomach, thus obscuring the drug entry into the colon. Colon-targeted drug delivery can prevent gastric degradation and localise the drug in the colon.

Methodology: The applicability of in situ polyelectrolyte complexation technique using the polymers Chitosan, Karaya gum, and Hupu gum at various concentrations along with enteric coating using Eudragit S100 was studied for the preparation of colon-targeted tablets of VH.

Colon-targeted tablets of VH are developed by incorporating natural polymers like chitosan, karaya gum, and hupu gum at different concentrations such that *in-situ* polyelectrolyte complex is formed and the formulations were then coated with Eudragit S100(6%, 8%, and 10% weight gain) to release the drug in a controlled manner in the colon.

Results: Prepared formulations were subjected to in vitro, ex vivo, and in vivo evaluation studies. Out of all the prepared formulations, the formulation H2C10 prepared with 10:2 PEC and 10% Eudragit S100 coating has shown a sufficient lag time of 2 hours in 0.1N HCl, 3 hours of lag time in pH 6.8 phosphate buffer and has shown a 100.02% drug release at 22 hours in pH 7.4 phosphate buffer.

Conclusion: The research results suggested that a colon-targeted drug delivery system of VH can decrease drug degradation and achieve higher concentrations in the colon to provide more therapeutic benefits.

Keywords: Colon targeted drug delivery, Chitosan, Hupu gum, In-situ polyelectrolyte complex, *In-vivo* studies, Karaya gum, Rat cecum

Introduction

The three-dimensional structure of the polymers, when used along with cross-linking agents, forms a mesh of polyelectrolyte complex (PEC) around the drug[1] and can be used for drug encapsulation[2]. PEC can be used as a vehicle for drug targeting and is especially useful when the drug release is based on pH as a stimulus. The colon

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The Expanding Scope of Emulgels: Formulation, Evaluation and Medical Uses

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ABSTRACT: Emulgels are semi-solid emulsions that combine the benefits of both emulsions and gels. They provide enhanced stability, sustained release and improved cosmetic properties. Emulgels can be fabricated using a variety of emulsification techniques and gelling agents like carbopol, hydroxypropyl cellulose. Characterization of emulgels includes evaluation of particle size, viscosity, pH, spreadability and drug release. Emulgels have promising applications in topical delivery of drugs and cosmetics, parenteral delivery of drugs and as emulsion-based oral drug delivery systems. Topical emulgels are used in skin care, hair care and cosmetics to provide moisturization, hydration, etc. Parenteral emulgels can deliver drugs in a sustained manner. Oral emulgels improve the absorption of some drugs. Several advantages of emulgels include sustained and controlled release of actives, improved solubility of both hydrophilic and lipophilic drugs, protection from degradation, and enhanced cosmetic elegance. However, emulgel formulation requires specialized emulsification equipment, and they have lower drug loading capacity compared to other semi-solid systems. Emulgels combine the benefits of emulsions and gels, providing a versatile drug and cosmetic delivery platform with unique advantages. Improvements in emulsification techniques, identifying newer gelling agents and permeation enhancers can further enhance the potential of emulgel systems. With growing research on emulgels, these systems are poised to make a significant impact on topical, parenteral and oral delivery in the coming years. Emulgels thus present an exciting prospect for developing innovative and improved formulations.

KEYWORDS: Cosmeceuticals, Emulgels, Emulsifying agents, Microemulsions, Rheology, Topical drug delivery

INTRODUCTION

Emulgels are novel colloidal delivery systems that combine the properties of emulsions and gels. They exhibit both fluid and semi-solid properties, providing interesting possibilities for drug delivery and other applications. Emulgels can encapsulate both hydrophilic and lipophilic actives and provide controlled release [1]. They also demonstrate enhanced stability compared to emulsions alone. Emulgels represent an exciting new class of delivery vehicles, and this review explores their potential and future prospects [2]. Despite their promise, emulgels have not been extensively reviewed in the literature. This article aims to provide a comprehensive overview of emulgels, focusing on their formulation, characterization, and applications.

DEFINITION, CHARACTERISTICS AND COMPONENTS

A. Definition

Emulgels are semisolid emulsions that contain both emulsion and gel components. They exhibit characteristics of both emulsions and gels, combining the benefits of these delivery systems [3]. Emulgels are hydrophilic lipid structures that provide sustained and controlled release of incorporated active pharmaceutical ingredients.

B. Characteristics

Emugels are unique in sense that they combine the properties of emulsions and gels. Fine tuning their internal and external phases make them more adaptable for loading any kind of drug. The key characteristics and techniques used for the preparation of emulgels are shown in Figure 1.

Case Report

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A CASE REPORT ON ORGANIC PSYCHOSIS INDUCED BY ANTITUBERCULAR DRUGS IN A YOUNG FEMALE

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Abstract

Antitubercular drugs including rifampicin, isoniazid and pyrazinamide can cause rare but severe adverse effects involving the central nervous system. Neuropsychiatric side effects ranging from headache to psychosis have been reported. Early identification and management is crucial to improve outcomes. We report the case of a 26-year-old female with a history of tuberculosis who developed symptoms of organic psychosis after taking antitubercular drugs for 45 days. She presented with altered sensorium, seizures, sensory and memory loss. Diagnosis of drug-induced psychosis was made based on the temporal association and exclusion of other causes. Symptoms resolved after discontinuation of the culprit medications. Clinicians should be aware of neuropsychiatric adverse effects of antitubercular drugs which though rare can be serious. Timely diagnosis and withdrawal of the offending medications are needed to improve outcomes in such cases.

Keywords: Anti-tubercular agents, Iatrogenicity, Isoniazid, Pyrazinamide, Psychotic disorders, Rifampin

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Introduction

Antitubercular drugs including rifampicin, isoniazid and pyrazinamide are effective first-line treatments for tuberculosis [1]. However, they can cause rare but potentially serious adverse effects involving the central nervous system [2]. Neuropsychiatric manifestations ranging from headache, dizziness and insomnia to psychosis have been reported in patients taking antitubercular medications. Elderly patients and those with preexisting neurological conditions may be at higher risk of developing such side effects [3]. Timely identification and proper management of drug-induced neuropsychiatric reactions is important to improve outcomes [4].

This case report aims to raise awareness about the neuropsychiatric side effects of antitubercular drugs in young patients. It describes a case of drug-induced psychosis in a young female patient, highlights the clinical features and diagnosis of drug-induced psychosis, discusses the potential mechanisms by which antitubercular drugs can cause neuropsychiatric side effects, emphasizes the importance of timely diagnosis and withdrawal of culprit medications, and increases clinicians' awareness of rare but serious neuropsychiatric adverse effects of antitubercular drugs that may affect patient adherence and treatment outcomes.

Case Presentation

A 26-year-old female with a history of tuberculosis, meningoencephalitis and typhoid fever in the past presented with altered sensorium, double vision, tremors, sensory loss and seizures for 5 days. She had been treated for tuberculosis 45 days ago with rifampicin, isoniazid, pyrazinamide and ethambutol for 6 months but only adhered to the medications for the first 45 days.

Examinations and investigations were unremarkable. A diagnosis of drug-induced organic psychosis was made given the temporal relationship and exclusion of other causes. The antitubercular medications were discontinued and supportive management initiated. Her symptoms gradually improved over the next 2 weeks.

Lab investigation

Lab tests are found to be normal in this case that helped rule out other potential causes of psychosis. The primary clue to the diagnosis is the clear temporal association between initiation of antitubercular medications and onset

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Observational Studies of Prescription Pattern and Use of Antibiotics in Selected Rural Areas

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Abstract

Rising antibiotic resistance amidst indiscriminate antibiotic use is a growing public health concern. Efforts to curb this trend have had limited success, particularly in developing nations. This study investigated antibiotic prescription patterns in India relative to the WHO's Aware, Watch, and Reserve (AWaRe) antibiotic grouping framework. Data was collected from retail and hospital-affiliated pharmacy outlets. Without prescription, 64% of antibiotics sold at retail outlets and 48% at hospital pharmacies. Lack of awareness on appropriate antibiotic use was observed among patients and pharmacists. Over-the-counter antibiotic purchases were higher in underserved communities with less healthcare access. Increased education on proper antibiotic use and resistance is urgently needed. More regulated antibiotic sales and expanded access to affordable healthcare are needed to curb rising antibiotic resistance. Better antibiotic stewardship through improved prescription practices aligning with the WHO's AWaRe framework can help optimize antibiotic use and preserve effectiveness of existing drugs.

Keywords: Antibiotics misuse, AWaRe, Resistance, Prescription, OTC, Hospital pharmacy.

1. Introduction

Antibiotic misuse, including overuse, underuse and inappropriate use, threatens public health by accelerating antibiotic resistance. About 50% of antibiotic prescriptions are estimated to be unnecessary, while many antibiotics are purchased over-the-counter without a prescription (Demoz et al., 2020). To optimize antibiotic use, the WHO developed the AWaRe antibiotic classification framework. "Assess" antibiotics are least likely to contribute to resistance and should remain widely available. "Watch" antibiotics require close monitoring due to higher resistance risks. "Reserve" antibiotics should only be used as last resort to treat resistant infections. In India, broad-spectrum antibiotic consumption is rising due to limited healthcare assess for underserved communities (Roberts & Zembower, 2021). Most of the people in rural areas obtain medications from pharmacies. To understand trends contributing to antibiotic misuse, this study examined prescription and purchase patterns through observational studies. Data was collected from hospital-affiliated and retail pharmacies. These findings provide insight into drivers of misuse and noncompliance with global stewardship guidelines. Improving prescription practices and aligning with the AWaRe framework could optimize antibiotic use and slow resistance (Morelli & Capurso, 2012). However, expanding healthcare assess and enhancing public education on appropriate antibiotic use are also critical to addressing this public health threat. This study sheds light on areas for targeted interventions to improve antibiotic stewardship and regulation in India. Optimizing antibiotic use now is essential to preserve the effectiveness of existing drugs.

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A Chronic Case of Hepatosplenomegaly in Elderly Diabetic Male

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DOI: 10.47760/ijpsm.2023.v08i05.006

Abstract

This case report presents the case of a 65 year-old male with a longstanding history of type 1 diabetes of 45 years duration. His diabetes was poorly controlled, as evidenced by the development of complications including hepatosplenomegaly and anemia. The patient presented with constitutional symptoms of fatigue, abdominal fullness and early satiety. His laboratory investigations revealed anemia with a hemoglobin of 11.5 gm% and a reduced red blood cell count. Ultrasonography showed hepatosplenomegaly with minimal ascites. A wide differential diagnosis for hepatosplenomegaly was considered, including infectious, hematological and autoimmune causes. However, in this patient with longstanding diabetes, the most likely etiology was diabetic microangiopathy leading to portal hypertension and congestion of the liver and spleen. Thorough diagnostic workup was performed to rule out other potential causes of hepatosplenomegaly. The management approach focused on improving glucose control to slow the progression of microvascular complications. Optimization of medications and lifestyle modifications were initiated. Monitoring for complications of portal hypertension such as variceal bleeding and ascites was instituted.

Keywords: Anemia, Diabetes Mellitus, Hepatosplenomegaly, Elderly, Anemia.

1. Introduction

Hepatosplenomegaly is a clinical condition characterized by the enlargement of both the liver and spleen. It can present with nonspecific symptoms such as abdominal fullness, early satiety and left upper quadrant discomfort (Baker, 2017). The underlying causes of hepatosplenomegaly are broad and include both malignancies and non-malignant conditions (Prasad et al., 1961). Common etiologies include infections, hematological disorders, autoimmune diseases and metabolic diseases. Type 1 diabetes is a chronic metabolic disease characterized by insulin deficiency and hyperglycemia. Poorly controlled diabetes over many years can lead to microvascular complications affecting small blood vessels throughout the body. Diabetic microangiopathy can involve the portal venous system supplying the liver and spleen, resulting in congestion, edema and enlargement of these organs (Zhang et al., 2018). This is a recognized cause of hepatosplenomegaly in patients with longstanding, poorly controlled type 1 diabetes.

The prevalence of hepatosplenomegaly in type 1 diabetes varies from 12-20% in different studies (Haymond and Berry Jr, 1954). The risk increases with age, duration of diabetes and poor glycemic control. While most cases of diabetic hepatosplenomegaly are mild and asymptomatic, some patients may present with early satiety, abdominal discomfort and constitutional symptoms as seen in the present case report. The main aim of this case report is to describe the case of an elderly diabetic male with hepatosplenomegaly and anemia and discuss the differential diagnoses, evaluation and management of this condition.

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(RESEARCH ARTICLE)

Check for updates

Natural antibacterial gel to fight tooth decay: An in-silico modeling approach

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Abstract

This study developed an antibacterial oral gel to inhibit *Streptococcus mutans*, a bacterium that causes tooth decay. The gel was formulated using methanol extract of Piper betel leave :, hydroxypropyl methylcellulose and glycerin at different concentrations. The formulated gel was evaluated for pH, viscosity and antibacterial activity against *S. mutans* using standard methods. The methanol extract showed potent antibacterial activity, supporting its use in the gel formulation. In silico molecular docking studies targeted key *S. mutans* protein residues involved in substrate binding. Eleven bioactive compounds identified in the Piper betel extract via GC-MS analysis were docked against protein 1EUH, an NADP-dependent aldehyde dehydrogenase from *S. mutans*. All 11 compounds exhibited favorable docking scores, suggesting strong binding affinity for the target protein. The docking results correlated with the antibacterial activity of the formulated gel, which inhibited S. mutans growth more effectively than sodium fluoride, a standard dental product.

Keywords: Aldehyde dehydrogenase; Antibacterial agents; Molecular docking; Oral gel; Piper betel; *Streptococcus mutans*

1. Introduction

Piper betel leaves, belonging to the Piperaceae family, have been traditionally used in medicine due to their numerous health benefits [1]. These leaves contain various bioactive compounds, such as alkaloids, phenols, flavonoids, and tannins, which demonstrate antimicrobial, antioxidant, anti-inflammatory, and analgesic properties [2]. Chewing betel leaves is a common practice that is believed to promote oral hygiene, freshen breath, and improve digestion [3].

Tooth decay is a prevalent issue affecting individuals of all ages worldwide[4]. The condition is caused by acid-producing bacteria, particularly Streptococcus Mutans, which can erode the enamel and dentin layers of teeth, leading to cavities [5]. Sodium fluoride is a widely used dental care product that can prevent dental caries by inhibiting S. Mutans growth; however, its overuse can result in harmful side effects such as fluorosis [6].

In this study, our objective was to develop an antibacterial oral gel using Piper betel leaves as a natural alternative to sodium fluoride. We employed an in-silico and docking process to predict the binding energies of bioactive compounds in betel leaves with the target protein of S. Mutans. Our results revealed that the betel leaf compounds exhibited high binding energies and were more effective against S. Mutans than sodium fluoride.

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A Case of Congestive Heart Failure with Gastrointestinal Bleeding and Altered Mental Status

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Abstract

Congestive heart failure (CHF) is a common cardiovascular condition associated with significant morbidity and mortality. Complications of CHF such as gastrointestinal bleeding and acute altered mental status pose diagnostic and therapeutic challenges. We present the case of a 75-year-old male with history of hypertension and coronary artery disease who presented with chest pain, vomiting, melena and decreased consciousness. Workup revealed anemia, elevated cardiac markers, evidence of congestive heart failure and subarachnoid hemorrhage. Clinicians should maintain a high index of suspicion for life-threatening complications in CHF patients presenting with atypical manifestations. Prompt diagnosis and optimization of underlying conditions are key to improving outcomes.

Keywords: Cardiovascular diseases, Congestive heart failure, Gastrointestinal hemorrhage, Mental status changes, Subarachnoid hemorrhage.

1. Introduction

Congestive heart failure (CHF) is a complex clinical syndrome characterized by impaired cardiac contractility and reduced cardiac output. It is a major cause of morbidity and mortality worldwide, affecting over 26 million people globally (Braunwald and Bristow, 2000; Smith, 1985).CHF is associated with various complications that can negatively impact prognosis (Omland, 2008). These include pulmonary and systemic embolism, cardiogenic shock, renal failure and neurohormonal disorders (Hosenpud and Greenberg, 2007).

Gastrointestinal (GI) bleeding and altered mental status are less common but serious complications of CHF. GI bleeding occurs in about 5-15% of CHF patients, commonly due to esophageal varices from portal hypertension (McKee et al., 1971). It is associated with increased hospitalizations, healthcare costs and mortality risk in CHF. Altered mental status in CHF can range from mild cognitive dysfunction to serious conditions like stroke, subdural hemorrhage and sepsis. The reported prevalence of altered mental status in CHF ranges from 20-50% (McKee et al., 1971).It is an independent predictor of adverse outcomes, disability and reduced quality of life.

While common complications of CHF such as pulmonary edema and arrhythmias have been well described, data on atypical presentations involving GI bleeding and altered mental status remains limited (Lespérance and Frasure-Smith, 2000). This case highlights the diagnostic and therapeutic challenges posed by these complex manifestations of CHF. A high index of suspicion and prompt diagnosis are needed to optimize management and reduce morbidity in such cases.

The main aim is to report the case of an elderly patient with congestive heart failure who had unusual symptoms of gastrointestinal bleeding and altered mental status. The objectives include highlighting the diagnostic challenges in elderly patients with congestive heart failure, discussing potential causes of the symptoms, emphasizing the importance of prompt diagnosis, identifying areas for improvement in management, and increasing awareness of atypical presentations of congestive heart failure that can lead to higher morbidity and mortality.

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Check for updates

Unconventional stationary phases: Nanomaterials, nanoparticles and the future of liquid chromatography

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Abstract

This review article discusses the impact of nanostructured stationary phases on liquid chromatography and separation science. These materials have revolutionized chromatography by enabling unprecedented levels of sensitivity, resolution, and applicability. Nanoporous silica, graphenic, monolithic, and nanoparticle-based phases continue to push the boundaries of biomolecular analysis, molecular diagnostics, and traceability testing. Nanostructured phases have made early detection of diseases, comprehensive profiling of proteomes, enhanced food origin traceability, and sensitive environmental monitoring possible. They facilitate isolation and analysis of biomacromolecules, extracellular vesicles, viruses, and trace constituents with high specificity and sensitivity even from minimal sample volumes. Furthermore, nanostructured phases are enabling integrated techniques, sensing capabilities, and responsive microdomains for advanced detection, purification, and separation of analytes. Continued progress in nanomaterial design, surface engineering, and micro-nanofabrication will lead to more sophisticated nano-LC approaches with translation across healthcare, food safety, materials analysis, and global sustainability. The review concludes that nanostructured stationary phases represent a pivotal frontier in chromatography and analytical sciences with tremendous potential to transform molecular diagnosis, precision medicine, origin traceability, and monitoring of health, food, and environment quality. Nano-LC promises to make comprehensive and minimally invasive molecular-level understanding more feasible, accessible, and impactful. These materials are an enabling technology with immense and far-reaching possibilities that will likely shape developments in analytical sciences and their use for years to come.

Keywords: Liquid Chromatography; Nanoparticles; Silica Gel; Proteomics; Molecular diagnostics

1. Introduction

Liquid chromatography (LC) relies on stationary phases with tailored characteristics for effective separation of analytes. Silica has traditionally been the most popular stationary phase material, but various inorganic and organic stationary phases have since been developed to suit diverse analyses [1].

In recent years, nanomaterials have emerged as promising candidates for stationary phases, with their unique properties enabling new levels of performance. Nanoporous silica, zirconia, titania, graphene and other nanomaterials are able to provide ultra-high surface areas, nanoscale confinement effects and facile surface modifications for superior sensitivity, resolution and applicability [2].

Nanoporous silica phases contain a network of nanopores that drastically increase solute retention and saturation capacity. Nanoparticle-coated and monolithic nanomaterials exhibit versatile and optimized characteristics based on their composition, nanostructuring and degree of hydrophobicity/hydrophilicity. Nanoporous graphene phases offer

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Accurate and Precise RP-HPLC Quantification of Piperacillin and Tazobactum Combination in Dosage Forms: A Quality Control Perspective

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Abstract

A simple, precise and accurate reverse phase high performance liquid chromatography (RP-HPLC) method has been developed and validated for the simultaneous estimation of piperacillin and tazobactum in pharmaceutical formulations. Separation was achieved on a C18 column using a mixture of potassium dihydrogen orthophosphate buffer (pH 3.5) and acetonitrile in the ratio of 60:40 v/v as the mobile phase at a flow rate of 1 ml/min. Detection was carried out at 226 nm. The retention times of piperacillin and tazobactum were about 2.5 and 4.3 min respectively. The method was validated as per ICH guidelines with respect to linearity, accuracy, precision, limit of detection, limit of quantification, robustness and ruggedness. The linearity ranges were found to be 5-15 µg/ml and 10-30 µg/ml for piperacillin and tazobactum respectively with correlation coefficients greater than 0.996. Accuracy, expressed as percentage recovery, was within 98-102%. The method also showed good precision and selectivity for the analysis of the drugs. The limits of detection and quantification for both analytes were adequate. In conclusion, the developed method was found to be suitable for the routine quality control analysis of piperacillin and tazobactum in pharmaceutical dosage forms.

Keywords: High Pressure Liquid Chromatography, Piperacillin, Tazobactam; Validation.

1. Introduction

Piperacillin/tazobactam is an antibiotic combination containing the extended-spectrum penicillin piperacillin and the beta-lactamase inhibitor tazobactam. It is used to reduce the risk of antibiotic-resistant bacteria. Piperacillin belongs to the ureidopenicillin class and treats infections caused by susceptible microorganisms. Tazobactam is used with beta-lactam antibiotics as an antibacterial (Gin et al., 2007).

Literature showed several HPLC methods for analyzing these drugs in pharmaceuticals and human samples (Veillette et al., 2016; Veni et al., 2013; Verhoven et al., 2018). However, a review revealed that while the pharmacokinetics of piperacillin and tazobactam have been extensively studied in humans, only a few analytical methods have been reported for drug formulations (Abdelkawy et al., 2023; Caro et al., 2021; Karanam & Prasad, n.d.; Kim et al., 2002; Mortensen et al., 2019; Singh, 2017; Zander et al., 2015) . Most available methods involve buffers which are not ideal for column efficiency. With this in mind, an attempt was made to develop a simple, precise and accurate reverse phase HPLC method for simultaneously analyzing piperacillin and tazobactam in drug products.

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Nootropic Activity of Ethanolic Extract of *Zingiber officinale* and *Centella asiatica* on Stress Induced Rats

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ABSTRACT: Nootropics, natural or synthetic substances that boost brain function and cognitive abilities, were investigated in this study. Specifically, the effects of *Zingiber officinale* and *Centella asiatica* extracts were compared to the standard nootropic piracetam. Both plant extracts demonstrated nootropic activity and contained phytochemicals like flavonoids, tannins, and saponins that protect the brain from oxidative damage. Sterols such as stigmasterol inhibiting acetyl CoA esterase activity were also present. Tests were conducted on rats given the extracts or piracetam daily for 7 to 21 days. High and low doses were used. Nootropic effects were measured using elevated plus maze and Morris water maze tests compared to controls. The results were promising: At higher doses, the extracts significantly reduced latency time to 21 ± 0.33 seconds compared to 33.33 ± 0.12 seconds for piracetam and 54 ± 0.08 seconds for controls. This suggests the plant extracts have considerable nootropic potential when administered at higher doses.

KEYWORDS: Nootropics, Elevated plus maze, Morris water maze, *Zingiber officinale*, *Centella asiatica*

INTRODUCTION

Though nootropics have gained popularity to boost mental functions, more research is needed to evaluate their potential benefits, especially for conditions like Alzheimer's [1]. Commonly used natural nootropics are thought to enhance brain function by altering neurotransmitters. Nootropics may work by dilating blood vessels in the brain, improving blood flow and the delivery of nutrients, chemicals, and oxygen [2]. Some act as modulators of acetylcholine or glutamate receptors, enhancing neurotransmitter activity and long-term potentiation between neurons. Plants have long been a source of medicines. Active compounds are isolated from plant parts like leaves, stems, roots and rhizomes [3,4]. However, many plants remain unexplored for their pharmaceutical potential. This study aimed to demonstrate the nootropic effects of *Zingiber officinale* and *Centella asiatica* individually and in combination. Elevated plus maze and Morris water maze apparatuses were used.

MATERIALS AND METHODS

A. Materials

Rhizomes of Zingiber officinale and leaves of Centella asiatica were procured from the surrounding areas of Kakinada and Surampalem, Andhra Pradesh India and were validated by Dr. T. Raghuram, Taxonomist, Maharani College, Peddapuram.

B. Methodology

Preparation of ethanolic extract of *Zingiber officinale*: Freshly harvested ginger rhizomes were cleaned to remove dirt. They were then sliced and dried in the shade for a period of time. The dried rhizomes were coarsely ground into a powder. The powdered ginger was weighed and mixed with ethanol for several days. The mixture was then repeatedly filtered under heat for about 3 hours. The extract solution was concentrated through evaporation of the ethanol solvent. The remaining product was dried and stored in a desiccators [5].

Preparation of ethanolic extract of *Centella asiatica*: Freshly harvested leaves of Centella asiatica were cleaned to remove dirt. They were then dried in the shade for several weeks. The dried leaves were coarsely ground into a powder. The powdered Centella asiatica leaves were weighed and mixed with ethanol for several days. The mixture was then repeatedly filtered under heat for about 3 hours. The extract solution was concentrated through evaporation of the ethanol solvent. The remaining product was dried and stored in a desiccators [6].

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Research Article

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EVALUATION OF INVITRO ANTIBACTERIAL AND ANTIOXIDANT ACTIVITIES OF *HEMEDESMUS INDICUS* ROOT EXTRACT

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ABSTRACT

The present research study highlights the antibacterial and antioxidant activities of *Hemedesmus Indicus* root extract. The coarsely powder of *Hemedesmus Indicus* root was subjected to invitro antibacterial activity, the ethanolic extract of root at a concentration of 50mg/ml was tested against gram negative bacteria *Klebsiella Pneumonia* (ATCC33495), *Pseudomons Aeruginosa* (ATCC10662), *Escherichia Coli* (ATCC10536),*Bacillus Subtilis* (ATCC11774), *Staphylococcus Aereus* (ATCCBAA1026) and the zone of inhibition was compared with standard drug Gentamicin 20 ug /ml. The *Hemedesmus Indicus* root extract at a concentration of 100 ug/ml was tested for its free its free radical scavenging activity adopting various methods like DPPH, Nitric oxide and reducing power assay. The extract exhibited significant antioxidant activity after comparing with standard drug gallic acid and the results were tabulated.

Keywords: *Hemedesmus Indicus*, Gentamicin, Gallic Acid, Antibacterial, Antioxidant Activity.

INTRODUCTION

Since the time immemorial our traditional system of medicine and folkloric claiming several medicinal plants as whole or their parts are being used in all types of skin diseases successfully against several bacterial and fungi. The medicinal preparations available in the market are not effective or has developed resistance resulting in reoccurrence again[1,2]. The literature survey on this medicinal plant *Hemedesmus Indicus* not much pharmacological work has been carried out and the natives are using this plant has folkloric for treatment of various ailments. Hence the researcher made a sincere attempt to evaluate the anti bacterial and anti oxidant activities on this medicinal plant root extract.

MATERIALS AND METHODS

Collection of Plant

The root of the medicinal plant *Hemedesmus Indicus* was collected from interior parts of Maredumilli forest region of East Godavari District, Andhra Pradeshand the plant was authenticated by taxonomist Prof. Dr. S.B.Padal.

Preparation of the Extract

The root of the plant was dried under the shade coarsely powdered and was subjected to extraction process using soxhlet apparatus using ethyl alcohol for 72 hours. The solvent was evaporated and the crude extract was dried in a dessicator for few days and this extract powder was used for evaluation of anti bacterial and antioxidant activities.

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EVALUATION OF INVITRO ANTIBACTERIAL AND ANTIOXIDANT ACTIVITIES OF ETHANOLIC EXTRACT OF WHOLE PLANT *JUSTICIA BETONICA*

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ABSTRACT

The ethanolic extract of whole plant *Justicia Betonica* is very commonly used in India and Sri Lanka as traditional medicine for the treatment of wide variety of diseases. The whole plant extract was tested for its antibacterial activity against several gram positive and gram negative bacteria such as *Klebsiella Pneumonia* (ATCC33495), *Pseudomons Aeruginosa* (ATCC10662), *Escherichia Coli* (ATCC10536), *Bacillus Subtilis* (ATCC11774), *Staphylococcus Aereus* (ATCCBAA1026), the zone of inhibitions was compared with standard drug Amikacin. Further the antioxidant activity using different methods like DPPH, Nitric oxide and reducing power assay were tested on the whole plant *Justicia Betonica* and the free radical scavenging activity was compared with standard reference drug gallic acid.

Keywords: *Justicia Betonica*, Amikacin, Gallic Acid, Antibacterial and Antioxidant Activity.

INTRODUCTION

The medicinal plant *Justicia Betonica* very commonly known as white shrimp / squirrel tail belongs to family acanthaceae, this is regarded as useful medicinal plant in folkloric medicine and Kenyans use this plant for the treatment of diarrhea[2], orchitis[3], headache and to reduce stomach gas. In our country inflorescence of the flowers is used orally for the treatment of vomting[4] and constipation[5]. The Indian and Sri Lankan community apply the crushed leaves of the plant to provide relieve of pain and swelling[6,7]. Decoction of the whole plant is used by the local tribals in Tanzania to provide relief of stomach ache[8].

MATERIALS AND METHODS

Collection of Plant

The whole plant of the medicinal plant *Justicia Betonica*was collected from interior parts of Jeddangi forest region of East Godavari District, Andhra Pradeshand the plant was authenticated by taxonomist Prof. Dr. S.B.Padal.

Preparation of the Extract

The whole plant was dried under the shade coarsely powdered and was subjected to extraction process using soxhlet apparatus using ethyl alcohol for 72 hours. The solvent was evaporated and the crude extract was dried in a dessicator for few days and this extract powder was used for evaluation of anti bacterial and antioxidant activities.

Antibacterial Activity

The various bacterial strains like *Klebsiella Pneumonia*, *Pseudomons Aeruginosa*, *Escherichia Coli*, *Bacillus Subtilis*, *Staphylococcus Aereus* were procured from microbes specialty lab in Rajahmundry, East Godavari District, Andhra Pradesh.

The Antibacterial activity is determined according to the standard method using Agar cup plate method[1]. 20 ml of sterile nutrient

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EVALUATION OF ANALGESIC AND ANTI-INFLAMMATORY, ACTIVITIES OF *HEMEDESMUS INDICUS* ROOT EXTRACT

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ABSTRACT

The present research study highlights the Analgesic and Anti-Inflammatory activities of *Hemedesmus Indicus* root extract. *Hemedesmus Indicus* root was evaluated for analgesic activity using Tail flick method, Eddy's hot plate method and Acetic acid induced writhing responses, Invitro anti-inflammatory activity by Protein Denaturation method and Human Red Blood Cells (HRBC) followed by Invivo anti-inflammatory method using Carragenen rat paw odema was carried out. The results obtained are found to be significant and compared to standard reference drugs.

Keywords: *Hemedesmus Indicus*, Analgesic and Anti-Inflammatory activities.

INTRODUCTION

Since the time immemorial our traditional system of medicine and folkloric claiming several medicinal plants as whole or their parts are being used in all types of various ailments. The medicinal preparations available in the market are not effective or has developed resistance resulting in reoccurrence again[1,2]. The literature survey on this medicinal plant *Hemedesmus Indicus* not much pharmacological work has been carried out and the natives are using this plant has folkloric for treatment of various ailments. Hence the researcher made a sincere attempt to evaluate the Analgesic and Anti-Inflammatoryactivities on this medicinal plant root extract.

MATERIALS AND METHODS

Collection of Plant

The root of the medicinal plant *Hemedesmus Indicus* was collected from interior parts of Maredumilli forest region of East Godavari District, Andhra Pradeshand the plant was authenticated by taxonomist Prof. Dr. S.B.Padal.

Preparation of the Extract

The root of the plant was dried under the shade coarsely powdered and was subjected to extraction process using soxhlet apparatus using ethyl alcohol for 72 hours. The solvent was evaporated and the crude extract was dried in a dessicator for few days and this extract powder was used for evaluation of Analgesic and Anti-Inflammatory activities.

Analgesic Activity

Tail Flick Method[3,7]

Procedure

In this method adult albino rats of either sex were selected. The basal reaction time to radiant heat by placing the tip of the tail on the radiant heat sources was recorded using stopwatch. The basal reaction time was observe at 0, 15, 30, 60, 120 mins, the analgesic effect of ethanolic leaf extract was assessed using this method.

In Tail flick method rats were treated with ethanolic extract of *Hemedesmus Indicus* (150mg/kg and 300mg/kg) orally) significantly inhibited nociception in rats.

The Extract of *Hemedesmus Indicus* 150mg/kg body weight at 30 mins significantly inhibited pain reception by 45.33% and 300

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EVALUATION OF NEPHRO PROTECTIVE ACTIVITY ON BARK OF *SOYMIDA FEBRIFUGA*

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ABSTRACT

The present study was carried out to evaluate the nephroprotective activity of traditional medicinal plant *Soymida febrifuga* belonging to the family Meliaceae. The bark part was selected for the activity and extracts were prepared using maceration procedure using different solvents successively. Different extracts of selected plants tested for preliminary phytochemical screening showed the presence of phytosterols, triterpenes, glycosides, alkaloids, flavonoids and carbohydrates. Acute toxicity studies were performed using hydroalcoholic extract as per guidelines in which selected plant extract showed neither visible sign of toxicity nor mortality. Nephroprotective activity was carried out using hydroalcoholic extract at 250 and 500 mg by estimating the biochemical parameters such as blood urea, serum creatinine, bilurubin and total protein. From the observed values the percentage protection of hydro alcoholic extract were plotted to compare biochemical parameters of all treatments with negative control values. The results were expressed Mean ±S.E.M, n=6 and significant values were expressed as $P<0.05$. The results of the present study provides the evidence on nephroprotective activity of selected medicinal plants and there is a scope to further studies on isolation of compounds from these species.

KEYWORDS: *Soymida febrifuga, bark, phytochemical screening, nephroprotective activity.*

INTRODUCTION

Nature can be considered as the ultimate chemist. Medicinal plants constitute the lifeline of the pharmaceutical industry. Man and his domesticated animals have since the time immemorial been largely dependent on plants for the essentials of their existence by way of food, clothing, shelter and medicines etc., besides various other uses.[1]

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Phytochemical Composition and Antidiabetic Potential of *Gymnema sylvestre* Extracts and Formulations

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Abstract:

Gymnema sylvestre is an Ayurvedic medicinal plant commonly known as gurmar used for the treatment of diabetes. The current study evaluated the phytochemical composition and antidiabetic potential of *G. sylvestre* leaf extracts and commercially available formulations. The extracts were prepared using ethanol and water through soxhelation. Phytochemical analysis revealed the presence of alkaloids, flavonoids, saponins and triterpenoids in the extracts. Chromatographic and spectroscopic techniques were employed for qualitative and quantitative comparison of the extracts and formulations. The ethanolic extract showed higher total phenolic and flavonoid content compared to the aqueous extract. *In vitro* antidiabetic assays demonstrated dose-dependent inhibition of alpha amylase and alpha glucosidase enzymes by the extracts. The ethanolic extract exhibited higher antioxidant and antidiabetic activity compared to the aqueous extract and formulations. Overall, the results indicate that *G. sylvestre* extracts possess phytochemicals and antidiabetic potential that can be further explored.

Keywords: *Gymnema sylvestre*, phytochemical composition, antidiabetic, alpha amylase, alpha glucosidase, chromatographic analysis.

1. Introduction

Diabetes mellitus is a chronic metabolic disorder characterized by high blood glucose levels due to defects in insulin secretion, insulin action, or both (Kulkarni et al., 2023). The number of people with diabetes has risen from 108 million in 1980 to 422 million in 2014 (Galicia-Garcia et al., 2020). Currently, diabetes affects more than 8% of adults worldwide and poses a major health threat (Chang et al., 2021). Diabetes management mainly focuses on lifestyle changes, oral hypoglycemic drugs and insulin therapy. However, these treatment options have several limitations including high cost, side effects and failure to modify the progression of the disease. Therefore, there is a need to explore alternative treatment strategies for diabetes, especially those based on plant sources. Medicinal plants have been used for centuries in traditional medicine systems to manage diabetes and related complications (Khafagy et al., 2007).

Gymnema sylvestre is an important medicinal plant used in Ayurveda for the treatment of diabetes. The plant is native to India and parts of Africa (Leach, 2007). Traditionally, *G. sylvestre* leaf extracts have been used to manage blood sugar levels, enhance insulin secretion, reduce sugar cravings and promote weight loss (Baskaran et al., 1990; Pothuraju et al., 2014). The hypoglycaemic effect of *G. sylvestre* is attributed to triterpenoid saponins known as gymnemic acids. Experimental studies have shown that *G. sylvestre* can inhibit carbohydrate

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CASE REPORT OPEN ACCESS

Persistent Infection in a Patient with Tibial Non-union

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ABSTRACT

This report presents a case of persistent pin site infection that resulted in the removal of hardware in a patient who underwent Ilizarov stabilization for compound tibial fractures. Despite antibiotics, the infection worsened, necessitating removal of the entire Ilizarov frame to prevent permanent damage or non-union. Bone marrow stimulators were subsequently placed for healing support. The report emphasizes the importance of rigorous pin site care, meticulous monitoring, low threshold for diagnosis of complications and swift escalation of treatment when needed. However, vigilance alone may not be enough, especially in those with co-morbidities, open injuries or hardware applications simplifying opportunities for nosocomial infection. The patient's recovery process involved early, optimized rehabilitation, medical and social supports, leading to a return to partial mobility and function despite a prolonged recovery process. Diligent follow-up was necessary at each stage to recognize complications before permanent damage and revise treatment plans as needed. The report aims to share lessons learned and strengthen preparedness for future cases facing similar challenges. Success emerged from determination, vigilance and partnership. Close monitoring makes the difference between catastrophic loss and maximal benefit from an ordeal already threatened by overcoming disability.

Introduction

Persistent infection following orthopedic trauma surgeries poses a significant threat to recovery and return of function [1]. Vigilant monitoring for early warning signs, prompt diagnosis of complications and expedient treatment are essential to optimizing outcomes and mitigating poor prognosis [2,3]. We present a case of prolonged pin site discharge and medullary infection leading to removal of hardware in a 66-year-old male who underwent Ilizarov stabilization of compound tibial fractures. Though the infection initially responded to antibiotics, it revealed vulnerabilities in the complex repair and immobilization that demanded surgical intervention to ensure healing and mobility [2]. This case highlights the importance of meticulous pin site care, close monitoring, early recognition of infection and willingness to take aggressive action when threats emerge despite best efforts. Without reactive problem-solving and patience through the rehabilitation process, good functional results can be easily lost [4].

Patients with severe, open injuries and prolonged surgeries/immobilization represent a particularly fragile segment of the population. While beneficial in stabilizing the damaged and enabling repair, these treatment approaches also introduce numerous opportunities for deterioration if not managed vigilantly [5]. There are few second chances once damage has been done, so diligence must be the rule.

We provide this report as a reminder of the responsibilities that come with managing such complex cases and a call to prioritize predictive prevention over reactive damage control wherever possible through optimal practices, multidisciplinary teamwork and follow-up.

Though setbacks are disappointing, commitment to the goals of surgery and enthusiasm for rehabilitation can help transcend them. This patient's case demonstrates how, with time and determination, good outcomes can still be achieved despite a loss of hardware and prolonged recovery. The journey is long, but not without hope if we learn from mistakes and persevere.

Case presentation

A 66-year-old male with a past medical history of tibial fractures 6 months ago, is treated with open reduction and internal fixation using an Ilizarov frame. He was presented with mild discharge from the pin sites of the frame for the past 2 weeks.

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REVIEW ARTICLE

Potential applications of Folate-conjugated Chitosan Nanoparticles for Targeted delivery of Anticancer drugs

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ABSTRACT:
Folate-conjugated chitosan nanoparticles represent a promising nanoplatform for targeted delivery of anticancer drugs. The nanoparticle carrier can protect the therapeutic agents from degradation and offer the ability to target cancer cells overexpressing folate receptors. This review summarizes recent research progress in synthesizing folate-conjugated chitosan nanoparticles as well as evaluating their potential as targeted drug delivery systems. The chemical conjugation of folic acid to chitosan is first discussed followed by an overview of different techniques for preparation of stable folate-conjugated chitosan nanoparticles less than 200 nm in size. Recent studies loading various anticancer drugs into these nanoparticles and investigating their in vitro cytotoxicity against multiple cancer cell lines are then summarized. The results indicate that folate-conjugated nanoparticles exhibit higher cytotoxicity and targeting efficiency compared to non-conjugated nanoparticles due to receptor-mediated endocytosis. Lastly, future challenges and opportunities are outlined including in vivo investigations to determine the effectiveness, toxicity, and pharmacokinetics of folate-conjugated chitosan nanoparticle systems as well as their potential clinical translation as targeted drug carriers for cancer chemotherapy.

KEYWORDS: Nanoparticles, Chitosan, Folic Acid, Targeted Drug Therapy, Antineoplastic Agents.

INTRODUCTION:
Nanoparticles are colloidal particles between 1 to 1000 nm in size that can be engineered for a variety of biomedical applications. One promising use of nanoparticles is as drug delivery vehicles for anticancer therapies. Nanoparticles can encapsulate or conjugate with antineoplastic drugs to improve their pharmacokinetics, stability and tumor accumulation while reducing side effects[1].

Upon reaching tumor tissues, nanoparticles can then release the encapsulated drug in a sustained or triggered manner. Several advantages make nanoparticles attractive as carriers for antineoplastic drugs: increased drug solubility and bioavailability, protection of drugs from degradation, prolonged drug retention at the tumor site, ability to incorporate targeting ligands for selective delivery to cancer cells[2].

Commonly studied nanoparticles for anticancer drug delivery include liposomes, dendrimers, polymeric nanoparticles and inorganic nanoparticles like gold and magnetic nanoparticles. The choice of nanoparticle carrier depends on factors like biocompatibility, drug encapsulation efficiency, controlled release capabilities

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Case Report

A Case Report of Heart Failure with Atrial Fibrillation and Peripheral Vascular Resistance

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ABSTRACT

Heart failure in elderly patients often presents with atypical manifestations due to the high prevalence of comorbid conditions. Symptoms may be subtle and under-reported. Timely diagnosis of heart failure and treatment of comorbidities are crucial for effective management. We describe a 75-year-old female with a history of similar complaints who presented with pedal edema, shortness of breath, and fatigue. Investigations revealed atrial fibrillation, severely reduced left ventricular function, and increased forearm vascular resistance suggesting peripheral vascular disease. Laboratory tests showed decreased uridine diphosphate levels. This case highlights the diagnostic challenges of heart failure in elderly patients with multiple comorbidities. Atypical presentations are common and timely recognition of underlying heart failure is needed to optimize management and prevent exacerbations. Treatment of comorbid conditions like atrial fibrillation and peripheral vascular disease may also help improve outcomes.

Keywords: Comorbidity, Differential Diagnosis, Elderly patients, Heart failure, Multiple coronary disease.

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INTRODUCTION

Heart failure in elderly patients is often accompanied by multiple comorbidities that complicate diagnosis and management.[1] Atrial fibrillation and peripheral vascular disease are common comorbidities in the elderly with heart failure, occurring in up to 30-50% of cases.[2] The presence of multiple conditions in the same patient results in complex interactions that can exacerbate symptoms, lead to atypical presentations, and affect treatment responses. As the population ages, there is a need for greater awareness of the challenges in diagnosing and managing heart failure in the context of comorbidities in the elderly.[3] This case report aims to highlight diagnostic and management considerations in elderly patients with complex, multimorbid presentations of heart failure. Objectives include describing atypical manifestations, discussing complex interactions between heart failure and comorbidities, emphasizing the importance of timely diagnosis and treatment, and increasing awareness of the need for a tailored approach to managing heart failure in the elderly.

CASE PRESENTATION

A 75-year-old female with a history of similar complaints in the past presented with pedal edema, shortness of breath, and fatigue for 1 week. Examination revealed elevated jugular venous pressure, bilateral basal crackles, and irregularly irregular pulse. Electrocardiogram showed atrial fibrillation and echocardiogram revealed severely reduced left ventricular function. Laboratory tests showed decreased uridine diphosphate levels. Measurement of forearm vascular resistance was increased, indicating peripheral vascular disease.

Elderly patients with heart failure often present with atypical manifestations due to the high prevalence of comorbid conditions like atrial fibrillation and peripheral vascular disease. A broad differential diagnosis should be considered.[4] A comprehensive geriatric assessment is performed on this patient to rule out other diagnoses. Comorbidities in the elderly result in complex interactions that can exacerbate heart failure symptoms, lead to under-reporting of symptoms and affect treatment responses.[5] Timely diagnosis of heart failure and optimization of management of comorbid conditions is key to improving outcomes in the elderly. A tailored approach is often needed.[6] Symptoms like pedal edema, shortness of breath, and fatigue are nonspecific and can be caused by heart failure as well as comorbidities. A multidisciplinary evaluation is required.[7] Measurement of biochemical markers like uridine diphosphate

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Case Report

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A CASE STUDY ON: SUBACUTE CUTANEOUS LUPUS ERYTHEMATOUS

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Abstract

Subacute Cutaneous Erythematous (SCLE) is an Auto-Immune skin disorder that cause skin sores and rashes when your immune system attacks itself. In this case report describe 39 years old female patient with SCLE. It is characterized by either ring-shaped red scaly border and also scaly red bumps in sun exposed areas associated with itching, pain and burning sensation. In this case, the patient has a multiple red colour lesions initially on the upper back region then spread to B/L UL, abdomen, chest, face and LL which is aggravating to sunlight. The patient is having a history of skin burns like lesions, tuberculomas and SJS. The diagnosis of SCLE was revealed by clinical presentation, Skin biopsy result and laboratory finding i.e. ANA Test was found to be highly positive and confirms that it is an autoimmune disease. The patient was treated with corticosteroid drug, DMARDs along with antihistaminic drugs and supportive therapy like nutritional supplements and skin lotion for external application, which led to significant improvement in the lesion formation and other symptoms. The case report highlights the careful monitoring and appropriate treatment of SCLE.

Keywords: SCLE, SJS, Tuberculoma, ANA test, DMARDs, autoimmune disorder.

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Introduction

Subacute Cutaneous Lupus Erythematous (SCLE) is an Autoimmune disorder also called an inflammatory connective tissue disorder which is characterized by pathogenic autoantibodies, immune complex formation, deposition, and attributed to the loss of immune tolerance. SCLE is presenting a symmetric, non-scarring photosensitive erythematous rash and skin sores usually over sun-exposed areas like the face, neck, arms, upper back, and shoulders associated with pain, itching and burning sensation [1]. The classical precipitating factor is due to sunlight exposure in a patient. SCLE primarily occurs in young to middle-aged females, as compared to males 3 to 4 times more likely to develop the lesions in females and it is highly photosensitive, with 60% to 90% of patients meeting the ACR definition of increased photosensitivity [2].

Case Report

A 39 years old female patient was admitted to the department of DVL (GSL General Hospital and Medical College, Rajahmundry) with the chief complaint of multiple red colour lesions which is initially started over the upper back region and spread to B/L UL, chest, abdomen, LL and faces which is aggravated to sunlight for 10 days.

She is having a history of burned skin like lesions 15 years back, 4 years back diagnosed with tuberculoma and 1 year back Steven Johnson syndrome for the treatment she has taken inj-dedemoron iv twice a day for 3 days and tab-cyclosporin mg twice a day for 3 days and tab-fluconazole oral twice a week and also stopped because of GI disturbance. She has a history of teetotaler and smoking packets per year.

Observation

Under general physical examination, blood pressure was found to be 120/80mmHg, pulse rate 60bpm, respiratory rate 22/min and temperature found to be afebrile. On systemic examination was found to be normal. On skin biopsy from the upper neck region and upper limb was observed (figure 1 and 3) and sent for skin biopsy on which fig 4 (epidermis -hyperkeratosis irregular acanthosis), fig.5 (perivascular lymphocytic infiltrate) Fig.6 (extravasated RBCs) conforms the SCLE.

Laboratory investigation shows a Hb level 8.6gm/dl% (anemia), WBC count is 6600 cells/cumm (leucopenia), urine ketone bodies are normal, serum sodium 143meq/L, serum potassium 3.7meq/L, serum creatinine 0.9mg/dl,

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Anti-Diabetic Agents in Covid-19, Their Possible Role Beyond Diabetes

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ABSTRACT: Recent reports from various observational investigations revealed and published the outcomes of Non-insulin Anti-diabetic agents. Patients additionally with Type-II Diabetes Mellitus and coronavirus disease, caused by severe acute respiratory syndrome [SARS] has become widespread disease in the world since last 3 years. Age, sex, ethnicity, obesity and co-morbidities all apparently enhance the risk of worst consequences. Glucose lowering drugs and anti-viral drug treatment could limit the risk but impose restrictions on their usage which needs to be carefully assessed. This severe acute respiratory syndrome [coronavirus] might be a potentially triggering and worsen the aspect for the diabetic patients that can bring about severe metabolic complications effecting β-cell function leading to hyperglycaemia and diabetic ketoacidosis.

KEYWORDS: Coronavirus, Co-morbidities, Diabetes Mellitus, Diabetic ketoacidosis, Hyperglycemia, Severe acute respiratory syndrome.

INTRODUCTION

Diabetes Mellitus is a very widely known risk factor in patients with coronavirus disease which appear to be in mutual ways [1]. One of the direct effects result is tied to a viral illness, while the other indirect is related to how managing blood sugar is affected by a pandemic. The patient's metabolism underwent drastic modifications as a result of the direct influence of COVID-19 and higher blood glucose levels [2, 3]. It is thought to cause an increase in cytokine and inflammatory mediator release. The indirect effects of COVID-19 studies on various populations indicate an improvement in glycemic control as a result of lockdown. While other research claim there has been no substantial impact or that the management of blood glucose in this population has got worse.

Glycemic control has been demonstrated to be essential for COVID-19 patients, and carefully controlled glucose management had reduced mortality rates compared to poor outcome which may have an impact on the outlook and severe consequences of the viral infection. Several therapies have been altered to combat COVID-19. Early research has linked that a biguanide category of oral hypoglycemic drug, Metformin might have resulted with a reduction in mortality [4]. But few recommendations from endocrinologist experts indicates the choice of glucose lowering agents mainly Metformin to be avoided in diabetic patients with COVID-19 due to lactic acidosis leading to multi-organ dysfunction [5]. However, experimental studies in research have shown that Metformin possessing anti-inflammatory and anti-viral properties beyond its glucose lowering action [6].

EPIDEMIOLOGY

Diabetes is considered to be the increased risk factor for infections in common and also the infections of the respiratory tract. Diabetes patients had more severe pneumonia, higher levels of lactate dehydrogenase, α-hydroxy butyrate dehydrogenase, alanine aminotransferase and γ-glutamyl transferase along with lymphocytes having higher neutrophil count [7]. Several studies in USA, UK and other parts of Europe revealed that patients with COVID-19 and diabetes led to an greater possibility of ICU admission [8, 9, 10]. COVID patients with diabetes will have worse prognosis because of conquering multiple factors. In an American survey, they have identified that young men with high glucose concentrations, obesity, hypertension and cardiovascular diseases are the conventional co-morbidities [11]. Older age is an important epidemiological feature related to high prevalence of COVID-19 [12, 13]. The high prevalence and worst consequences of COVID-19 are due to lifestyle, socio-economic factors and prevalence of cardiovascular risk factors and obesity.

PATHOPHYSIOLOGY

Infection with SARS-COVID and Diabetes Mellitus results in increased mortality with resulting cascade of events that predisposes individuals with hyperglycemia leading to increased viral proliferation [14].

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FORMULATION AND EVALUATION OF GASTRORETENTIVE MUCOADHESIVE TABLETS OF CLOPIDOGREL

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ABSTARCT

Oral administration is the most convenient and preferred means of any drug delivery to the systemic circulation. Oral controlled release drug delivery systems (CRDDS) have recently been of increasing interest in pharmaceutical field to achieve improved therapeutic advantages. oral sustained-controlled release formulations is an attempt to release the drug slowly into the gastrointestinal tract (GIT) and maintain an effective drug concentration in the systemic circulation for a long time. Clopidogrel is an oral thienopyridine - class antiplatelet agent used to inhibit blood clots in coronory artery disease, peripheral vascular disease, and to prevent myocardial infraction. In the present work, an attempt has been made to formulate GRDDS of Clopidogrel using different mucoadhesive polymers like Hydroxy propyl methyl cellulose K100M (HPMC K100M), Sodiun carboxy methyl cellulose (NaCMC), Carbopol 934P and Poly vinyl pyrrolidone K30 (PVP K30) in order to prolong the drug release, and to impart mucoadhesive properties to the controlled release tablet formulations. Total 13 formulations are prepared, out of all formulations F13 containing both HPMC K100 and Na CMC gave the best results that is 99.9% in the time period of 16 hours. All the formulations passed the pre and post compression studies.

KEYWORDS: Controlled release drug delivery, Gastrointestinal tract, Clopidogrel, Hydroxy propyl methyl cellulose, Sodiun carboxy methyl cellulose, Poly vinyl pyrrolidone, Mucoadhesive.

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Drug-Induced Bullous Pemphigoid

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ABSTRACT

Drug-Induced Bullous Pemphigoid is an autoimmune disorder in which they develop blister forms on the skin it mainly interacts with Immunoglobin G contains the Fab region which interacts with proteins activated to attach hemidesmosomes to one of the antigen called Bullous Pemphigoid antigen 1 and antigen 2 and destroys the basal layer of the epidermis of skin leads to Bullous Pemphigoid which triggered by the drugs of chemotherapy like paclitaxel and carboplatin in this condition. It works mainly to reduce apoptosis and reduce cancer. By acting on the cells it may reduce abnormal cell growth and reduces the immune system to produce an overgrowth of cells. Acting on our immune system can lead to Bullous Pemphigoid.

KEYWORDS

Bullous Pemphigoid
Ig G Antibodies
Cell Growth
Immune System

I. Introduction:

It is a rare condition that occurs in older conditions. It is an autoimmune skin disease it causes the skin to form blisters[1]. Skin is divided into 3 layers epidermis, dermis, and hypodermis. Epidermis is made up of keratinocytes which are pan cake-shaped cells containing keratin protein. Stratum basale is a single layer of stem cells that continually divides producing new keratinocytes also contains melanocytes that secrete melanin which is a pigment-protein. Basement membrane containing collagen and laminins and hemidesmosomes which is a protein complex present in the bottom of basal cells. It is mainly triggered by furosemide, captopril, penicillamine, NSAIDS, and antibiotics. Bullous pemphigoid is a type II hypersensitivity reaction in which our immune system produces antibodies[2]. B cells produce Ig G antibodies containing the Fab region and Fc region. Fab region binds with the pathogens and helps other immune cells destroy that pathogen IgG. IgG antibodies also activate the complement cells that destroy the pathogen or induce inflammation. In bullous pemphigoid, the Fab region binds with proteins to produce the hemidesmosome one of the antigens isbullous pemphigoid antigen 1 (BPAG11 or dystonia) and the other protein is the bullous pemphigoid antigen 2 (BAPG2,BP180 or the 17 Collagen)[3]. The Fcregionactivates the complement system the process starts with the C1 protein binds with the Fc region which engages the complement family (c2-c9) some are activated by being cleaved by an enzyme the cleaved enzymes c3a,c4 a, and c5a act as chemotactic factors they attract the mast cells. The mast cells degranulate and releasemolecules that aretumor necrosis factor, leukotrienes, and cytokines like cytokines.also attract the inflammatory cells like neutrophils, eosinophils, macrophages, and T cells these inflammatory cells secrete proteolyticenzymes which the destroys the proteins of hemidesmosomes(BPAG and BPAG2) if hemidesmosomes destroyed the basal cells separated from the basement membrane and split form in between epidermis and dermis. It forms the subepidermal bullae is distinct from the epidermal bullae. In epidermal bulla form in pemphigus vulgaris. In bullous pemphigoid, it also affects the keratinocytesstarting with the inner cells of the dermis. There is no Nikolsky's sign and circulating IgG antibodies. The patient received the chemotherapycontaining sulfhydryl group in cells that changethe antigenic properties of the cell surface leading to antigen and antibody interaction leading to pemphigoid.

II. CASE REPORT

A 57-old-female patient came to the DVL ward of GSL General Hospital, Rajahmundry with a complaint of blisters (fluid-filled) all over the body for 3 days associated with a burning sensation.

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Formulation and Evaluation of Sustained Release Atorvastatin Tablets Using Natural Polymers, with a Focus on Okra Gum

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Abstract

This research study presents the development and evaluation of sustained-release tablets of Atorvastatin using five distinct natural polymers, namely guar gum, xanthan gum, hibiscus gum, okra gum, and soya bean gum, at different drug-polymer ratios. The formulations underwent rigorous pre-compression and post-compression assessments to ensure their quality and efficacy. The utilization of natural polymers in drug formulations has gained significance due to their cost-effectiveness, biocompatibility, and eco-friendliness. In this study, we investigated the potential of these natural polymers to create sustained-release tablets, a vital need for long-term management of conditions like hypercholesterolemia. Atorvastatin, a BCS class-II drug, was chosen as the model drug for this study, as it plays a crucial role in managing cardiovascular diseases related to high blood pressure. The pre-compression tests ensured that the formulations met pharmacopoeial standards for characteristics such as bulk density, angle of repose, compressibility index, and Hausner's ratio. The post-compression studies confirmed that the tablets exhibited acceptable features, including hardness, friability, and weight variation. In vitro dissolution studies revealed that formulation F8, incorporating okra gum as the rate-retarding polymer, exhibited an impressive 98.5% drug release after 10 hours. This suggest that okra gum holds promise as a natural polymer for designing sustained-release drug formulations. Overall, this study provides valuable insights into the use of natural polymers for the controlled release of drugs, particularly Atorvastatin, and could pave the way for further research in this field.

Keywords: Atorvastatin, Sustained Release, Natural Polymers, Okra Gum, Drug Delivery.

1. Introduction

Cardiovascular diseases, including hypercholesterolemia, continue to be a leading cause of morbidity and mortality worldwide. Among the various therapeutic agents used to manage these conditions, Atorvastatin, a BCS class-II drug, has proven to be highly effective (Gradman and Alfayoumi, 2006; Teaima et al., 2021). Atorvastatin acts by inhibiting the enzyme 3-hydroxy-3-methylglutaryl-coenzyme (HMG-CoA) reductase, a key player in cholesterol production. However, its relatively short half-life, poor solubility, and pH-dependent solubility have led researchers to explore innovative drug delivery systems (Martsenyuk et al., 2019).

Sustained-release formulations offer a promising solution for managing long-term diseases, such as hypercholesterolemia, by optimizing drug release kinetics and reducing dosing frequency. This paper focuses on the development of sustained-release tablets of Atorvastatin, which is achieved by incorporating five distinct natural polymers: guar gum, xanthan gum, hibiscus gum, okra gum, and soya bean gum. The selection

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(RESEARCH ARTICLE)

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Exploring the super-disintegrating properties of fenugreek seed mucilage for fast-dissolving amlodipine tablets

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Abstract

Fast dissolving tablets of amlodipine besylate were developed to improve patient compliance for hypertension treatment. Trigonella foenum-graecum (fenugreek) seed mucilage was used as a superdisintegrant in the formulation of fast dissolving tablets by direct compression method. Eight formulations with varying concentrations of fenugreek mucilage, microcrystalline cellulose, lactose and other excipients were prepared and evaluated for physicomechanical properties, drug-excipient compatibility, disintegration time, wetting time, water absorption ratio and in-vitro dissolution. The optimized formulation F6 containing 5% fenugreek mucilage, 75mg microcrystalline cellulose, 90mg lactose showed a disintegration time of 14 seconds, wetting time of 22 seconds and 90% water absorption. *In-vitro* drug release of 63% was observed within 15 minutes from F6 formulation. Physical and chemical stability studies showed the optimized F6 formulation was stable for 3 months at 40 °C/75%RH. Hence, fenugreek seed mucilage can be effectively used for developing amlodipine besylate fast dissolving tablets with improved patient compliance.

Keywords: Amlodipine besylate; Fenugreek mucilage; Fast dissolving tablets; Superdisintegrant; Formulation optimization

1. Introduction

Oral drug delivery is the most popular route of drug administration due to its advantages of convenience and patient acceptability. Among oral solid dosage forms, tablets are the most widely used due to their ease of production, stability, and portability [1]. However, difficulties swallowing tablets and capsules can reduce patient compliance, especially in elderly populations [2]. To address this issue, fast dissolving drug delivery systems have been developed that dissolve rapidly in the oral cavity without need for water.

Hypertension, or high blood pressure, is a chronic condition affecting over 1 billion people worldwide. Left uncontrolled, it increases the risks of heart attack, stroke, and other serious health issues. Amlodipine is an oral calcium channel blocker commonly prescribed for hypertension and related conditions like angina. However, swallowing tablets can pose challenges for some patients. This study aimed to develop a fast dissolving tablet formulation of amlodipine besylate using Trigonella foenum-graecum (fenugreek) seed mucilage as a natural superdisintegrant [3]. Rapid dispersion in saliva could enhance patient convenience and compliance with antihypertensive therapy [4].

The aim of this study was to develop fast-dissolving tablets of amlodipine besylate using the mucilage of Trigonella foenum-graecum (fenugreek) seeds as a natural superdisintegrant. Fenugreek mucilage was selected for its fast disintegrating properties with the goals of rapidly achieving a therapeutic plasma concentration of amlodipine, decreasing tablet disintegration time through improved water uptake, and reducing wetting time. Tablets were prepared by a simple and cost-effective direct compression method.

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CASE REPORT OPEN ACCESS

Concurrent Diagnosis of Renal Calculi, Uterine Fibroids and Ovarian Cysts: A Complex Case Study

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ABSTRACT

This case report presents a complex clinical scenario in a 41-year-old female patient, highlighting the concurrent diagnosis of renal calculi, uterine fibroids, and ovarian cysts. The patient's medical history reveals a prior diagnosis of renal calculi six months ago, characterized by flank pain and urinary symptoms. More recently, the patient sought medical attention due to abnormal bleeding and discomfort, leading to the discovery of a bulky uterus with fibroids and a left ovarian cyst categorized as O-RADS 2 (benign). Notably, the patient was undergoing hormone replacement therapy for perimenopausal symptoms. While these conditions typically have distinct etiologies and anatomical locations, their simultaneous presence prompts consideration of potential systemic factors or shared risk factors contributing to this multifaceted clinical presentation. The case underscores the importance of comprehensive evaluation and individualized management strategies in patients with multiple concurrent diagnoses, emphasizing the need for multidisciplinary collaboration between urologists and gynecologists to optimize patient care and outcomes. Further investigation may be warranted to explore any potential connections or underlying factors linking these diverse medical conditions.

Introduction

Concurrent diagnoses of renal calculi, uterine fibroids, and ovarian cysts in a single patient present a complex medical scenario. Renal calculi, characterized by the formation of kidney stones, are typically unrelated to conditions affecting the female reproductive system. However, the patient's history of renal calculi diagnosed six months prior, alongside the recent discovery of uterine fibroids and an ovarian cyst, raises intriguing clinical questions. Uterine fibroids are common benign growths within the uterine wall, whereas ovarian cysts are fluid-filled sacs that can develop on the ovaries [1]. This case report aims to elucidate the clinical intricacies of this rare combination of medical conditions and explores potential associations or underlying factors. The patient's ongoing hormone replacement therapy for perimenopausal symptoms further adds to the complexity. By presenting this case, we seek to highlight the need for comprehensive evaluation, interdisciplinary collaboration and tailored management strategies to address the challenges posed by these simultaneous diagnoses [2]. Our objective is to improve our understanding of such complex clinical presentations and facilitate better patient care.

Case Presentation

A 41-year-old female patient was presented with a complex medical history. Six months ago, she was diagnosed with renal calculi following severe flank pain and hematuria. Details about the size, location and treatment response of the renal calculi are pertinent to this case. Additionally, she was undergoing hormone replacement therapy using Ethinyl Estradiol (0.03mg) and Desogestrel (0.15mg) for perimenopausal symptoms.

Clinical Findings

Clinical examination revealed a bulky uterus containing fibroids (20x13mm) at anterior myometrium. An ovarian cyst (44x33mm) categorized as O-RADS 2 (benign) was identified, demanding attention to its size and morphology. The ultrasound scan report is shown in Figure 1. A hypoechoic lesion within the myometrium was also observed, necessitating investigation into its size and location within the uterine wall.

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Design and Evaluation of Polyherbal Nanogel for The Treatment of Rheumatoid Arthritis

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Abstract

A typical autoimmune condition known as rheumatoid arthritis is linked to progressive impairment, systemic problems, early death, and socioeconomic expenses. Rheumatoid arthritis has no known cause, and the prognosis is uncertain. However, new therapies with better results have been developed as a result of breakthroughs in our knowledge of the disease's aetiology. The current therapeutic approach, which reflects this advancement, involves starting intensive therapy shortly as a diagnosis is made and escalating the medication in the goal of clinical response while being guided by an evaluation of the disease condition. The medicinal industry is not an alternative to the increasing paradigm of nanotechnology, which is evoking advancements in practically all technological sectors. It has long been utilised for artificial medicine production. The emphasis today is on conventional therapies, though. This study has a considerable application in the developing field of nanomedicine because it focuses upon the nanogel preparations of conventional drugs. As the risks and shortcomings of contemporary medicine become more obvious, herbal therapies are experiencing a comeback because they are viewed as a fair and well-balanced method of therapy. The effectiveness of herbal medicines in the treatment and management of disease is demonstrated by developments in analytical and clinical studies. Herbal treatments' primary drawback is their failure to dissolve and stabilize. Newer technological developments may be able to solve the issues with herbal remedies. Nano-formulations show how modern technology and herbal medicines interact. Consequently, herbal medications' increased stability, homogeneity, low toxicity, and strong drug encapsulation capacities make them a promising candidate for innovative drug delivery systems.

Keywords: *Rheumatoid arthritis, Boswellia, nanogel*

1. Introduction

Millions of people throughout the world suffer from the chronic autoimmune disease rheumatoid arthritis (RA). This article seeks to give a thorough overview of RA, covering its causes, signs, symptoms, diagnosis, available treatments, and the effects it has on people's life. is a sophisticated autoimmune condition that mainly affects the joints. RA develops when the immunological system wrongly assaults the body's own tissues, as opposed to the more prevalent osteoarthritis, which is frequently linked to joint wear and tear. The synovium, the covering of the membrane that surrounding the joints, becomes chronically inflamed as a result of this inflammatory reaction. Although RA can

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Complications of COVID-19 and possible role of angiotensin converting enzyme inhibitors and anti-platelet medications in lowering the risk of COVID -19 infection

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Abstract

COVID-19, the worldwide pandemic which effected the entire health care system, particularly showed its ill effects on patients with many comorbidities. Among the COVID-19 patients admitted in hospital, are with cardiovascular diseases and hypertension where associated with increased risk of mortality. Angiotensin converting enzyme inhibitors (ACEI) and Angiotensin receptor-II blockers (ARB) were used in the management of hypertension and these medications revealed their beneficiary actions in the conditions of COVID -19 with Hypertension. On the other hand, COVID -19 also lead to thromboembolic complications which also required Intensive Care Unit admission within patients representing a unique condition termed as Covid Associated Coagulopathy (CAC). The impact of dual anti-platelet therapy reduced the risk of mechanical ventilation, ICU admission and mortality rate among individuals effected by Covid.

Keywords: Cardiovascular diseases; Thromboembolic diseases; Covid Associated Coagulopathy; Angiotensin converting enzyme inhibitors; Angiotensin receptor-II blockers; Anti-platelet therapy

1. Introduction

COVID-19 has placed significant onus on the health care systems worldwide, affecting patients with many comorbidities very severely in patients suffering particularly with cardiovascular diseases. The statistical analysis indicate 10.5% of fatal cases with cardiovascular diseases and 6% in patients with severe hypertension [1]. Most patients with cardiovascular comorbidities are treated with Angiotensin converting enzyme inhibitors and Angiotensin receptor-II blockers [2]. Severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) uses the receptor Angiotensin converting enzyme-2 (ACE) for the entry into the target cells [3]. Among patients with COVID-19 admitted in hospital, the emerging data indicate that hypertension also may be associated with an increased risk of mortality due to COVID-19 [4, 5, 6].

The important data obtained from the patient demographic information, medical history, clinical characteristics, laboratory data, radiological report data, history of comorbidities and therapeutic interventions during the hospitalization and clinical outcomes were considered. The patient demographic information and clinical characteristics include age and gender, fever, cough, fatigue, dyspnea, heart rate, respiratory rate and blood pressure. The radiological report data and laboratory data like blood cell count, C- reactive protein, calcitonin, D-dimer and organ function markers were considered. Comorbidities like hypertension, coronary heart diseases, chronic renal diseases, cerebrovascular diseases, chronic liver diseases and chronic obstructive pulmonary disorder were extracted from medical history [7].

The objective of this article is to understand the different complications associated with covid-19 and studying the beneficial actions of Angiotensin converting enzyme inhibitors and Anti-platelet therapy in bringing down the mortality rate.

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EVALUATION OF IN-VIVO ANALGESIC AND ANTIINFLAMMATORY ACTIVITIES OF ETHANOLIC LEAF EXTRACT OF CORDIA MYXA

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ABSTRACT

The presented research deals with the evaluation of analgesic and anti-inflammatory activities of the ethanolic extract of Cordia myxa leaves on albino Wister rats. Analgesic activity was observed in albino Wister rats of both sexes using paradigms such as the tail flick method, the eddy hot plate method. While anti-inflammatory activity was observed using the carrageenan-induced paw edema method. In the tail flick method and eddy's hot plate method, rats were treated with the extract at doses (100 mg/kg and 200 mg/kg) Po was observed at 0, 15, 30, 60, 120 minutes. Rats treated with the extract were compared with standard tramadol (5 mg/kg). In the tail flick method, Cordia myxa extract at a dose of 200 mg/kg significantly increases the latency of the nociceptive reaction of the tail withdrawal from the heat source. In the eddy's hot plate method, the extract at a dose of 200 mg/kg significantly increases the latency of jumping and licking responses. In the carrageenan-induced paw edema method, rats were treated with the extract at doses (100 mg/kg and 200 mg/kg) Po and observed at 0, 1, 2, 3, 4 hours and compared with standard Diclofenac sodium (10 mg/kg). Leaf extract at a dose of 200 mg/kg showed maximum percent inhibition of paw edema in rats at 4 h.

KEYWORDS: Analgesic activity, Anti-inflammatory activity, Carrageenan, Eddy's hot plate method.

INTRODUCTION

Inflammation is a physiological process that involves the intervention of the immune system. The key role of inflammation is to protect organisms against microbial infections, and in some instances, it acts as a physiological defense mechanism against certain diseases such as cancer.[1] However, under certain circumstances, inflammation can become harmful, leading

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EXTRACTION- PHYTOCHEMICAL SCREENING AND BIOLOGICAL ACTIVITIES OF SPATHODEA CHAMPANULATA LEAVES

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ABSTRACT

Spathodea campanulate is plant species under the family of Bignoniaceae. It is commonly known as African tulip tree, which has been used as laxative, antiseptic, antifungal, anti-inflammatory and anti-epileptic. The endeavor of the study was to quantify, isolate and phytochemical and biological screening. Extraction was carried by maceration using acetone. The mixture of individual components from the extract is identified in accordance with Rf values. In this study acetonic extract was used to measure flavonoid content, tannin content, phenolic content, anti-bacterial, antifungal, anti-inflammatory and anthelminthic activities.

KEYWORDS:- Spathodea, Inflammatory, Flavonoid, Tannin.

INTRODUCTION

Herbal medicines are naturally occurring, plant derived substance that are used to treat illness and regional healing practices. Indigenous cultures use herbs in their healing rituals, while others developed traditional medicinal systems such as ayurveda and traditional chines medicine in which herbal therapies were used. Secondary metabolites of plants are terpenoids, phenolic compounds, alkaloids, flavonoids, toxins and tannins are act as antimicrobial, anthelminthic, anti-cancer agents etc.

Spathodea campanulate Beauvais tree is native to Africa. In tropical Africa it is planted as an ornamental plant, E.g. in cape Verde, Zimbabwe and Madagascar. It is widely grown in tropical and sub-tropical regions outside Africa. This plant is also commonly found in India as an ornamental plant and also called as African tulip. Spathodea belongs plant kingdom, under class of Magnoliopsida, family Bignoniaceae, genus Spathodea P.Beauv, species S.

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EVALUATION OF ANTIBACTERIAL, ANTHELMINTIC, AND ANTIDIARRHOEAL ACTIVITIES OF ETHANOLIC AERIAL EXTRACT OF MIMOSA PUDICA LINN.

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ABSTRACT

Mimosa pudica an important medicinal plant having several benefits against many diseases belongs to the family fabaceae. The present study was designed to investigate the Antibacterial, Anthelmintic and Antidiarrhoeal activity of ethanolic extracts of aerial parts of Mimosa pudica linn. Antibacterial effect was tested against gram positive bacteria such as Bacillus subtilis and gram-negative bacteria such as Escherichia coli, Pseudomonas aeruginosa using cup plate method and agar well diffusion method. Anthelmintic activity of the plant extract was studied in parasitic worm Pheritima posthuma. The antidiarrhoeal potential of the ethanolic extract of mimosa pudica has been evaluated in Swiss albino mice against the standard Loperamide and using castor oil for inducing diarrhoea. The current detailed research study revealed *Mimosa pudica* aerial parts possess significant Antibacterial, Anthelmintic and Antidiarrhoeal potential. This research study could establish information for the possibility to develop a herbal formulation in future for the treatment of various ailments.

KEYWORDS: *Mimosa pudica*, Antibacterial, Anthelmintic, Antidiarrhoeal.

INTRODUCTION

Mimosa pudica is a creeping annual or perennial herb which is known to possess sedative, emetic, and tonic properties.[1] The benefits of *Mimosa pudica* has been mentioned in Ayurveda and has been in use from many years. Local natives used the plant leaves for various medicinal purposes such as treatment of depression, piles, insomnia, skin wounds, diarrhea, anxiety, urogenital disorders, and many more. *Mimosa pudica*, as it is commonly

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(RESEARCH ARTICLE)

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Exploration of melt granulation technique for the development of entecavir monohydrate tablets using 3^2 factorial designs

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Abstract

This research work aims to fabricate fast-release tablets of entecavir monohydrate using a novel melt granulation technique and optimize the proportion of xylitol and mannitol using a 3^2 factorial design. entecavir monohydrate, a medication used for treating hepatitis B virus (HBV) infection, was used as a model drug. The fast-release tablets were designed to avoid fluctuations in plasma drug concentration and increase the bioavailability of entecavir monohydrate. The FTIR spectra of pure entecavir monohydrate were compared against polymers which had no interaction. The pre-compression and post-compression parameters were found to be within the desired range. The results of the drug release studies indicate that the formulations were able to release the drug within the desired range of 60-80% within 10 minutes. The study concludes that the melt granulation technique can be used to develop fast-release tablets of entecavir monohydrate with good compressibility, flow characteristics, and mechanical strength.

Keywords: Entecavir monohydrate; Fast disintegrating tablets; Melt granulation; Factorial design; Optimization.

1. Introduction

Melt granulation is a process used to produce granules by adding either a molten binder or a solid binder that melts during fabrication of the tablet. This technique can be broken down into 3 stages: wetting-nucleation, coalescence, and attrition-breakage (1). In melt granulation, a binder makes up 10-30% of the total weight of the fine particles. The binder should be meltable and its melting point should be between 50-200°C. Hydrophilic molecules are often used as binders for immediate-release dosage forms, while hydrophobic molecules are used for prolonged-release dosage forms (2). One advantage of melt granulation is that it doesn't employ solvents, and thus streamline the process and eliminates the need for drying. This can also reduce processing time.

Entecavir monohydrate is used in the management of Hepatitis B virus (HBV) infection(3). The objective of this research is to fabricate tablets of entecavir monohydrate utilizing the melt granulation technique and fine-tune the proportion of xylitol and mannitol until the formulation has optimal characteristics using 3^2 factorial design. Additionally, melt granulation leads to a uniform dispersion of fine particles and offers good stability at different pH levels and levels of moisture(4). The study intends to show that melt granulation can be employed to generate a multifaceted, compressible excipient for usage in the pharmaceutical industry (5). In this research work, entecavir monohydrate was used as a drug candidate to develop fast-release tablets using xylitol and mannitol through a novel melt-granulation technique. The fast-release tablets aimed to avoid fluctuations in plasma drug concentration and increase the bioavailability of entecavir monohydrate.

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(RESEARCH ARTICLE)

Check for updates

Development and validation of an HPLC method for the simultaneous estimation of salbutamol, theophylline and ambroxol in tablet dosage form

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Abstract

A simple, accurate and precise reverse phase high performance liquid chromatographic (RP-HPLC) method has been developed and validated for the simultaneous estimation of Salbutamol, Theophylline and Ambroxol in pharmaceutical formulations. The chromatographic separation was achieved on a Inertsil ODS-3V (250 × 4.6 mm, 5µ) column using a mobile phase consisting of phosphate buffer (pH 3.0): acetonitrile in the ratio of 55:45 v/v at a flow rate of 1 mL/min. Detection was carried out at 225 nm. The retention times for Salbutamol, Theophylline and Ambroxol were found to be 2.317, 3.808 and 5.863 min respectively. The proposed method was validated as per the ICH guidelines and was found to be linear in the concentration range of 0.5-3.0 µg/mL, 25-150 µg/mL and 7.5-45 µg/mL for Salbutamol, Theophylline and Ambroxol respectively with correlation coefficients greater than 0.999. The developed method was found to be precise, accurate, robust and specific. Forced degradation studies proved the stability-indicating capability of the developed HPLC method. The developed method can be successfully applied for the routine analysis of Salbutamol, Theophylline and Ambroxol in pharmaceutical dosage forms.

Keywords: HPLC; Salbutamol; Theophylline; Ambroxol; Validation; Simultaneous estimation; Tablet dosage form

1. Introduction

Salbutamol (SAL), chemically known as 4-[2-(tert-Butylamino)-1-hydroxyethyl]-2-(hydroxymethyl)phenol [1] is a beta-2 adrenergic receptor agonist used as a bronchodilator in the treatment of asthma and chronic obstructive pulmonary disease (COPD). Theophylline (THE) or 1,3-dimethyl-2,3,6,7-tetrahydro-1H-purine-2,6-dione is a methylxanthine drug which acts as a bronchodilator by relaxing smooth muscles in the airways of the lungs. It is used for the treatment of bronchoconstriction in conditions like asthma and COPD [2]. Ambroxol (AMB), chemically known as trans-4-(2-Amino-3,5-dibrombenzylamino)-cyclohexanol, is an expectorant drug used for the treatment of respiratory diseases associated with viscous or sticky mucus [3]. It helps in clearing mucus from the respiratory tract and reducing cough.

SAL, THE and AMB have synergistic effects when used in combination. SAL acts as a bronchodilator to relax airway smooth muscles, THE enhances mucociliary clearance and relaxes bronchial smooth muscles while AMB reduces viscosity of respiratory secretions and facilitates their clearance. A fixed dose combination of these three drugs helps in providing effective relief from symptoms like bronchospasm, breathlessness and excess mucus production in conditions like asthma and COPD [3]. Several analytical methods have been reported for the estimation of these drugs individually

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RESEARCH ARTICLE

Silymarin: Harnessing the Healing Potential of Milk Thistle for Cardiovascular Health and Liver Diseases

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ABSTRACT

Milk thistle, or Silybum marianum, is a medicinal herb used for over 2000 years to support liver health. Silymarin, a flavonoid extract from milk thistle seeds, has garnered scientific interest for its antioxidant and anti-inflammatory properties with potential hepatoprotective and cardioprotective effects. This review summarizes current research on the medicinal properties and potential health benefits of silymarin, with a focus on applications in treating liver and cardiovascular diseases. Limited clinical evidence suggests that silymarin supplements may help manage conditions like hepatitis, fatty liver disease and hypertension through its abilities to reduce oxidative stress, inhibit inflammation and scavenge free radicals. However, existing data is predominantly from small trials with methodological limitations. Larger well-designed studies are needed to validate many observed benefits and determine optimal dosing. Within recommended doses, silymarin appears to be relatively safe with mostly mild side effects. Future research should focus on conducting rigorous human studies, elucidating molecular mechanisms of action, exploring synergistic combinations with drugs, and establishing guidelines for special populations. While promising, more conclusive evidence is required to confirm silymarin as an effective and safe remedy for liver and heart ailments.

Keywords: Cardiovascular Diseases, Liver Diseases, Oxidative Stress, Phytotherapy, Radical Scavenging, *Silybum marianum*

Prescription Pattern and Drug Utilisation Analysis in Patients with Cardiovascular Disorders

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ABSTRACT:

Cardiovascular diseases (CVDs) represent a significant global health challenge, warranting in-depth analysis to enhance our comprehension of these complex conditions. This research, titled "Prescription Pattern and Drug Utilization Analysis in Patients with Cardiovascular Disorders," endeavors to unravel the multifaceted landscape of CVDs by investigating demographic profiles, prescription patterns, and survival experiences among a cohort of 140 patients.Our study's diverse patient cohort revealed a broad spectrum of demographic and clinical characteristics. Patients spanned a wide age range (37 to 85 years) with a mean age of 60.99 years. Gender distribution showed a notable disparity, with 82 males and 58 females, stimulating considerations regarding potential gender-related differences in CVD presentation and outcomes. Furthermore, an array of comorbidities and clinical presentations underscored the complexity of CVDs and the necessity for tailored therapeutic strategies.The examination of prescription patterns uncovered considerable variability in the number of drugs prescribed, emphasizing the need for personalized treatment regimens. Statistical analyses, including one-way ANOVA and Chi-square tests, contributed insights into gender-related associations within the dataset. A Decision Tree analysis revealed age and treatment duration as pivotal predictors, aiding in the classification of patient groups according to their survival experiences. Additionally, survival analysis elucidated disparate survival dynamics among patients across diverse CVD categories, with some groups displaying notably shorter mean survival times.This research holds vital implications for clinical practice, advocating for personalized medicine approaches, gender-conscious healthcare strategies, and targeted interventions tailored to specific CVD diagnoses. Moreover, it establishes a solid foundation for future investigations with larger and more diverse datasets, promising further advancements in our understanding of CVDs and facilitating improved patient care in the ever-evolving landscape of cardiovascular medicine.

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REVIEW ARTICLE

A Systemic review of machine learning approaches for adverse drug reaction detection: Novel perspective and challenges

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Abstract: Medication errors significantly impact patient treatment outcomes, necessitating the integration of modern technologies for improved detection and prevention. This review amalgamates findings from multiple studies on medical decision support systems and machine learning to predict and mitigate prescribing errors. A systematic examination of 30 articles published between 2015 and 2023 reveals the utilization of various methodologies, including outlier detection testing, interruptive prescribing alerts, and probabilistic, machine learning-based clinical decision support systems. The review underscores the imminent need for sophisticated techniques to address the limitations of traditional Adverse Drug Reaction (ADR) detection methods. Notably, the incorporation and refinement of machine learning approaches emerge as promising strategies. The examination of these studies highlights the potential of machine learning to revolutionize patient safety and healthcare quality by enhancing efficiency and accuracy. In conclusion, this review emphasizes that machine learning represents a groundbreaking approach in detecting and preventing medication errors. The integration of advanced methods, coupled with a robust reporting system, is crucial for advancing the landscape of ADR discovery. This approach not only facilitates efficient and accurate healthcare delivery but also ensures a patient-centric focus, marking a significant stride towards improved patient safety and healthcare quality.

Keywords: Machine learning; Adverse drug reactions; Clinical decision support systems; Medication errors; Patient safety

1. Introduction

Pharmaceutical formulations consist of chemical compounds designed to elicit therapeutic responses against pathological conditions; however, instances may arise wherein these chemical agents manifest paradoxical effects, leading to morbidity or fatality.[1] ADR management costs can reach $250 US dollars for a person in India, which is unnecessarily costly for a developing nation where the average income of lower class people is less than $100 US dollars. India ADR reporting rate is less than 1%, whereas the global figure is 5%. ADR occurrence is statistically analyzed with the aid of methods such as the spontaneous reporting system, which is used for signal detection.[2] However, there are a number of limitations and issues with SPS, including underreporting and bias in the identification of pharmacological side effects. The diagnosis of adverse events is frequently not made clear in professional medical reports of adverse occurrences. In actuality, even though the majority of ADRs are on the list of differential diagnoses that physicians can use, it might be challenging to diagnose them.[3] Generally speaking, if the cause is not obvious, it is not reported as an ADR. As a result, numerous investigations taking into account this SRS constraint are currently underway. Electronic medical record (EMR) data are another source of ADR study data, and they are crucial for verifying clinical evidence. [4]

They furnish detailed statistical delineations concerning the experiences of afflicted patients undergoing medical interventions, encompassing prognostic assessments and the duration of prescribed medications, commencing from the initiation to the cessation dates of the prescribed drug regimen [5] Timely detection of ADEs could allow screening and the diagnosis of adverse events regularly which isn't made clean in professional clinical reports of adverse event. Additionally, it is tough to diagnose ADR in spite of the fact that the ones patients are below monitoring. [6]

The process involves integrating data from several sources obtain from the presents significant problems for traditional reporting systems such as the prescription event monitoring, chart review, spontaneous reporting system, and medication report. Here the problem with those systems is prone to discrepancies. Since they depend on continuous reporting and prescription patterns. Those shortcomings in classic ADR detection techniques include underreporting, costly manual procedures, and difficulties integrating

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CASE REPORT

A case report on drug-induced bullous pemphigoid in a cervical cancer patient undergoing chemotherapy

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Abstract: Bullous pemphigoid (BP) is an autoimmune disorder characterized by the development of fluid-filled blisters on the skin, and it is a rare but serious complication linked to specific medications, notably chemotherapeutic agents. This case details a 57-year-old female with stage-II cervical cancer who experienced widespread blistering lesions on her body after undergoing two cycles of chemotherapy involving paclitaxel and carboplatin. The patient noticed the appearance of multiple fluid-filled, reddish blisters on her hands, back, abdomen, and lower extremities, accompanied by a burning sensation, three days after the initial day of the latest chemotherapy session. Confirmatory histopathological and immunological assessments established the diagnosis of BP, an immune-mediated condition targeting the basement membrane zone through autoantibodies against bullous pemphigoid antigen-1 and antigen-2. The patient's symptoms were successfully managed with corticosteroids, and the implicated chemotherapeutic agents were discontinued. This case underscores the crucial importance of monitoring cancer patients undergoing chemotherapy for cutaneous adverse reactions, especially those presenting with blistering eruptions. It highlights the necessity for prompt recognition and appropriate management of drug-induced bullous pemphigoid in such cases.

Keywords: Bullous pemphigoid; Autoimmune disorders; Antibodies; Cancer; Chemotherapy

1. Introduction

Bullous pemphigoid (BP) is a rare autoimmune skin disorder characterized by the formation of fluid-filled blisters on the skin [1]. The epidermis, composed of pancake-shaped keratinocytes containing keratin protein, consists of a single layer of stem cells in the Stratum Basale, continuously producing new keratinocytes. Melanocytes within the Stratum Basale secrete melanin, a pigment-protein. Bullous pemphigoid is predominantly triggered by certain medications such as furosemide, captopril, penicillamine, NSAIDs, and antibiotics.

This condition represents a type II hypersensitivity reaction, wherein the immune system generates antibodies, specifically IgG antibodies produced by beta cells. The Fab region of these antibodies binds with proteins, including bullous pemphigoid antigen 1 (BPAG11 or dystonia) and bullous pemphigoid antigen 2 (BPAG2, BP180, or the 17 Collagen). Simultaneously, the Fc region activates the complement system, initiating a cascade that attracts mast cells, which release inflammatory molecules. Inflammatory cells like neutrophils, eosinophils, macrophages, and T cells are then attracted, leading to the destruction of hemidesmosome proteins (BPAG and BPAG2). [2] The destruction of hemidesmosome results in the separation of basal cells from the basement membrane, forming a split between the epidermis and dermis, without Nikolsky's sign and circulating IgG antibodies. The reported case involves a patient who developed bullous pemphigoid after receiving chemotherapy containing sulfhydryl group-containing cells, altering the antigenic properties of the cell surface. Autoantibodies, either circulating or tissue-bound, directed against bullous pemphigoid antigen 1 or bullous pemphigoid antigen 2, primarily cause this condition, with a higher incidence in women. Bullous pemphigoid typically presents with tense blisters or bullae over the trunk and extremities, accompanied by intense pruritus. Mucosal involvement is rare. The condition can be drug-induced, and distinguishing between Bullous pemphigoid (BP) and Drug-induced bullous pemphigoid (DIBP) poses a challenge. DIBP can be caused by various medications, including antihypertensives, nonsteroidal anti-inflammatory drugs, diuretics, antiarrhythmics, antidiabetics, antirheumatics, antibiotics, tumor necrosis factor inhibitors, vaccines, and other agents. [3,4]

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CASE REPORT

A Comprehensive case report on Henoch-Schonlein Purpura in a child

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Abstract: Henoch-Schonlein Purpura (HSP), also known as IgA vasculitis, is an uncommon vasculitic disorder characterized by immune-mediated inflammation affecting small blood vessels, particularly those in the skin, joints, gastrointestinal tract, and kidneys. Predominantly observed in the pediatric population, HSP entails the deposition of immune complexes in these vessels, instigating inflammatory responses leading to hemorrhagic manifestations such as palpable purpura. This case report delineates the clinical presentation, diagnostic assessment, and therapeutic interventions in the context of a 5-year-old child diagnosed with Henoch-Schonlein Purpura. Common manifestations include gastrointestinal symptoms, palpable purpura, arthralgias, and renal involvement. This report underscores the critical role of an inter-professional healthcare team in enhancing patient care and emphasizes that timely and appropriate interventions in HSP can ameliorate the disease progression, curtail organ damage, and forestall potentially life-threatening complications.

Keywords: Henoch-Schonlein Purpura; Vasculitis; Immunoglobulin-A; Koebnerization; Diascopy

1. Introduction

Henoch-Schonlein Purpura is a rare IgA-mediated auto-immune systematic vasculitis disorder mainly characterized by inflammation of small blood vessels affecting the vasculature of several systems including skin, gastrointestinal tract, renal system, and joints [1]. It causes mainly rash, swollen joints, belly pain, nausea, vomiting, protein, or blood in the urine, sub-acute edema, scrotal edema, hematemesis, rectal bleeding, diarrhea, and fatigue [2]. It is a systemic disease where the IgA complex activates the complement pathway, resulting in inflammation of blood vessels, and bleeding into the skin causing rashes (purpura). Its etiology is unclear but is associated with environmental, genetic, and antigenic factors apparat to contribute HSP. It typically affects children below 10 years old and is rarely seen in adults and adolescents [3]. It is the most common vasculitis in children and is estimated that 10 to 20 children per 100,000 per year are affected by this condition [4]. The global prevalence of HSP was estimated to be 3.6 per 100,000 [5]. It is more common in boys the girls [6]. The HSP is the common vasculitis cutaneous disorder in children mostly 90% of the cases [7, 8]. The reoccurrence rate is 2.7% to 30%. This case report discusses the clinical manifestation, evaluation, and management of HSP and explains the inter-professional team's role in improving patient care.

2. Case report

2.1. Presentation

A 5-year-old male patient was admitted to the department of pediatrics in the tertiary care hospital of Rajahmundry, Andhra Pradesh with the chief complaint of rashes for 1 week on their back, feet, and elbow associated with itching and patient had swelling of feet and both knees since today associated with pain and having low-grade intermittent fever for 1 week with a history of abdominal pain. He had no such significant history of illness. Also, no familial history of such an illness. The patient has a history of falls on a bicycle. The patient had taken a BCG immunization vaccine as per NIS. And BCG scar is present. The child on antenatal care, IFA taken, regular antenatal check-ups done, no history of gestational diabetes and gestational hypertension, and the baby cries immediately after birth.

2.2. Diagnosis

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CASE REPORT

A case report of Grade I Hepatic Encephalopathy in a chronic alcoholic liver disease patient

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Abstract: This case report discusses about a 49-year-old male with grade I hepatic encephalopathy, a complication of chronic alcoholic liver disease. With a 20-year history of heavy alcohol consumption and recent cirrhosis diagnosis, the patient presented symptoms such as confusion, disorientation, drowsiness, and abdominal distension. Physical examination revealed icterus, pitting edema, hepatomegaly, and mild ascites. The comprehensive treatment regimen addressed various aspects of the patient's condition. Lactulose syrup reduced gut ammonia levels, ceftriaxone and rifaximin prevented enteric infections, and a frusemide/spironolactone combination reduced ascitic fluid. Vitamin B supplements aided neurological repair, dexamethasone served for its anti-inflammatory effects, and protein supplements corrected malnutrition. Liver supportive measures included alcohol abstinence and paracentesis to drain excess ascitic fluid. The patient exhibited significant improvement in symptoms and laboratory parameters during the hospital stay. Liver and kidney function tests normalized, and coagulation profiles steadily improved. Confusion and disorientation resolved completely, and repeat ultrasound confirmed a reduction in ascitic fluid. The patient was discharged in a stable condition. This case highlights the importance of a holistic therapeutic approach to effectively manage grade I hepatic encephalopathy secondary to alcoholic liver cirrhosis. Addressing multiple contributing factors, including abstaining from alcohol and employing pharmacological, nutritional, and procedural interventions, can lead to the reversal of mild hepatic encephalopathy.

Keywords: Hepatic encephalopathy; Cirrhosis; Alcoholism; Liver function; Holistic treatment.

1. Introduction

Alcoholic liver disease (ALD) refers to a spectrum of liver pathology caused by excessive alcohol consumption ranging from simple steatosis to cirrhosis. It is one of the leading causes of chronic liver disease worldwide [1, 2]. Long standing heavy alcohol intake damages the liver cells leading to fat deposition, inflammation and fibrosis over a period of time. This can ultimately result in cirrhosis where the liver architecture is severely disrupted due to scar tissue formation.

Cirrhosis of liver impairs its function to clear gut derived toxins like ammonia from the bloodstream. Increased amounts of ammonia crossing the blood brain barrier can cause hepatic encephalopathy (HE) [3-6]. HE describes a range of neurological symptoms seen in patients with liver dysfunction and portosystemic shunting, caused by the effect of toxins on the brain. It can present as subtle abnormalities in neurological exam to coma. Grading scales like West Haven criteria are used to classify the severity of HE. Grade I HE involves mild alterations in cognition without any motor signs [7-9]. The pathophysiology involves astrocyte swelling secondary to increased glutamine levels from ammonia metabolism within the brain. Current treatment aims to reduce sources of ammonia production like alteration of gut bacteria and impairing ammonia absorption from the gut [10]. Mild cases are managed medically, while severe cases may require emergency interventions and intensive care unit care. Treatment involves non-absorbable disaccharides, antibiotics, albumin, ornithine, phenylbutyrate, rifaximin etc [11].

However, many a times patients with ALD-related HE continue to have neurological symptoms despite standard medical therapy indicating the need for additional therapeutic modalities. This case report aims to describe the effective management of a patient with grade I HE due to alcoholic cirrhosis through a holistic treatment approach targeting multiple disease processes. The objective is to highlight the role of comprehensive pharmacological, nutritional and procedural interventions along with abstinence from alcohol in reversing mild hepatic encephalopathy in such patients.

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CASE REPORT

A comprehensive case report on dapsone hypersensitivity syndrome

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Abstract: Dapsone is an antimicrobial agent with anti-inflammatory properties used commonly in the treatment of leprosy. However, it can rarely cause a severe adverse drug reaction known as dapsone hypersensitivity syndrome (DHS). The main objective of this case report is to highlight the challenges in diagnosis and management of this potentially life-threatening DHS. We present a case of a patient who developed DHS after long-term dapsone therapy. The clinical features, laboratory and radiological investigations, differential diagnosis and treatment are described. The patient presented with fever, skin rash and involvement of multiple organs. DHS was confirmed based on diagnostic criteria. Dapsone was immediately discontinued and the patient was started on corticosteroids. Other potential causes were ruled out. DHS is a rare but serious reaction to dapsone. It can mimic other conditions making diagnosis challenging. Awareness of this adverse effect is important for healthcare professionals prescribing dapsone, especially long-term, to promptly identify and manage the condition. Our case highlights the key aspects in diagnosis and management of DHS.

Keywords: Drug hypersensitivity; Adverse drug reaction; Dapsone syndrome; Leprosy

1. Introduction

Dapsone (4,4'- diamino – diphenyl sulfone) is a sulfone derivative with potent antimicrobial and anti-inflammatory properties. It works by inhibiting the biosynthesis of folic acid through competitive inhibition of dihydropteroate synthetase. Due to its activity against pathogens like Mycobacterium leprae and Pneumocystis jirovecii, dapsone remains an important first-line therapy for leprosy and Pneumocystis pneumonia prophylaxis [1,2]. It is also used in the treatment of dermatitis herpetiformis and various bullous dermatoses like pemphigus vulgaris. However, dapsone is known to cause severe adverse drug reactions [3-5]. One such reaction is dapsone hypersensitivity syndrome (DHS), previously known as drug reaction with eosinophilia and systemic symptoms (DRESS). First reported in 1950, it typically manifests 1-2 weeks after initiation of dapsone therapy [6,7]. Clinically, DHS is characterized by a triad of fever, skin eruption and end-organ involvement. The liver and hematopoietic system are most commonly involved, with rates of hepatic involvement ranging from 34-94% in various case series [8-10]. Presentation can range from mild abnormalities in liver enzymes to fulminant hepatitis.

The incidence of DHS is estimated to be approximately 1 in 1000 dapsone exposures [9]. Diagnosis is challenging due to its variable manifestations and similarity to other conditions. It carries significant morbidity and mortality if not recognized and managed promptly. While DHS was initially associated with antiepileptics, it is now recognized with a variety of drugs including dapsone, sulfonamides, allopurinol and metronidazole. Immediate withdrawal of the culprit drug along with supportive measures forms the mainstay of treatment [10, 11]. Here we describe a case of biopsy-proven DHS that developed in a patient receiving long-term dapsone therapy. Through this report, we aim to enhance awareness of this serious adverse reaction among healthcare workers to facilitate early identification and management of DHS

2. Case report

2.1. Subjective evidence

A 14-year-old female patient presented to the paediatric ward of a tertiary care hospital with chief complaints of high grade fever for one week and jaundice involving the skin and eyes for one week. Her past medical history was significant for Henoch Scholien

* Corresponding author: Bhavya Neerupalli

CASE REPORT

Case Report of Budd-Chiari Syndrome secondary to hepatic vein thrombosis

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Abstract: Budd-Chiari syndrome is a rare disorder characterized by obstruction of hepatic venous outflow which can range from asymptomatic to severe manifestations including liver dysfunction. We present a case of a 29-year old male who presented with abdominal distension, breathlessness and dry cough. He had a history of Budd Chiari syndrome secondary to hepatic vein thrombosis for two years and portal vein thrombosis with cavernous transformation. Clinical examination revealed hepatomegaly and ascites. Laboratory investigations showed elevated liver enzymes and imaging revealed portal vein thrombosis with cavernous transformation. He was diagnosed with Budd-Chiari syndrome secondary to hepatic vein thrombosis. He underwent IVC venoplasty under fluoroscopy guidance using balloons with significant improvement seen post-procedure. Standard medical management including anticoagulation, antibiotics and supportive care was also provided. His liver function tests significantly improved after treatment. IVC venoplasty combined with medical management can be an effective treatment option for Budd-Chiari syndrome secondary to hepatic vein thrombosis.

Keywords: Budd-Chiari syndrome; Hepatic vein thrombosis; IVC venoplasty; Portal vein thrombosis; Liver function tests

1. Introduction

Budd-Chiari syndrome is a rare medical condition characterized by the blockage of blood outflow from the liver, primarily affecting the hepatic veins. This obstruction can manifest at different levels, including the small hepatic veins within the liver, the major hepatic veins as they exit the liver, or the inferior vena cava where the hepatic veins drain into. The consequence of this blockage is an increase in pressure within the liver veins, leading to blood congestion within the liver tissue. The clinical manifestations of Budd-Chiari syndrome vary widely based on the severity and duration of the venous outflow obstruction. The estimated global incidence of this syndrome is exceptionally low, with only 1-2 cases per million people, and it is slightly more prevalent in females. The condition is primarily associated with specific causes, with myeloproliferative neoplasms accounting for approximately 50% of cases. Around 30% of cases are linked to genetic or acquired conditions that heighten the risk of blood clot formation, while the remaining cases often result from structural or anatomical abnormalities that compress the hepatic veins.

Timely identification of the underlying cause is crucial in managing Budd-Chiari syndrome effectively. Early initiation of appropriate treatment is essential to prevent long-term complications and reduce mortality. Swift diagnosis helps mitigate progressive damage to liver cells, preventing complications such as liver failure and life-threatening bleeding from esophageal varices. The management of Budd-Chiari syndrome involves aggressive interventions aimed at reopening blocked vessels and preventing further obstruction.

We present a case of Budd Chiari syndrome secondary to hepatic vein thrombosis managed successfully with IVC venoplasty along with standard medical management. The objective is to discuss the clinical presentation, diagnostic evaluation, treatment approach and outcome of this case to add to existing literature on management of this rare disorder.

2. Case presentation

A 29-year-old male patient presented to the emergency department with complaints of abdominal distension and breathlessness for past 4 months and dry cough for 5 days.

* Corresponding author: Mukesh Kumar Saphi

JOURNAL OF PHARMA INSIGHTS AND RESEARCH

RESEARCH ARTICLE

An Exploratory analysis of determinants influencing the quality of life in individuals diagnosed with Pulmonary Arterial Hypertension

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Abstract: Pulmonary arterial hypertension (PAH) is a rare condition characterized by elevated blood pressure in pulmonary arteries, with an incidence of 15-50 cases per million annually. Improving QOL and increasing survival are the two main objectives of PAH treatment. So to understand and address the multi factors that affect the QOL for providing the holistic patient centric care approach to improve the QOL. A cross-sectional observational study was conducted with in a span of 6-month, chi-square test & regression analysis were employed to examine the association. Patient information was gathered directly from the case sheet additionally physical examination like Blood pressure, SPO2, RR were individually taken. The St. George's Respiratory Questionnaire (SGRQ), Kuppuswamy scale, Morisky medication adherence scale was employed to understand the association between those factors. Our study explores the several factors affecting QOL of PAH patient. Our observation shows that majority of the patient at the age from 61 to 80 and >80 is having low QOL ($p<0.001$). A significant difference was found between SGRQ and overweight ($p=0.03$) and also smoking history, low socioeconomic status and poor adherence of drug had negative impact of QOL on both chi square and regression analysis. Our study shows that there is profound and severe influence on the QOL of individual grappling with PAH. The complex interaction between those factors contributes on understanding the challenges face by PAH patient reflect the urgent need of comprehensive care strategies. This study supports our hypothesis that demographic, socioeconomic, clinical factor impact the QOL on PAH patient.

Keywords: Pulmonary Arterial Hypertension; Quality of Life; St. George's Respiratory Questionnaire; Kuppuswamy Scale; Morisky Scale.

1. Introduction

Individual health can't be described on having a medical condition; it is also about how the condition affect everyday life. PAH is a complex condition characterized by elevated blood pressure in pulmonary arteries. [1, 2] Living a life with a disease that is life-limiting such as Pulmonary Arterial Hypertension can lead to many problems on a patient. In our research we try to find out all the factors affecting person quality of life while dealing with PAH. [3] Pulmonary hypertension (PH), a broad category of chronic, progressive disorders, is defined by an increase in pulmonary artery pressure that can be caused by several factors. Hypertension in the heart occurs when left untreated. It may result in fatality if right ventricular failure occurs. A patient's diagnostic workup and management typically include assessments of a variety of severity and prognosis indicators, including the Borg Dyspnoea Index, the World Health Organization functional class (WHO FC), the 6-minute walking distance (6MWD), and several laboratory biomarkers, including invasive hemodynamic evaluation. Still, these metrics are not accurate enough to evaluate the overall health and quality of life (QoL). [4] What is looked at, though, is the narrower definition of health-related quality of life (HRQoL), sometimes known as "the measure of quality of life in clinical trials." the way a patient feels about how an illness affects their ability to function and how that condition is treated. HRQoL may be a particularly relevant result in PAH. Current PAH medications can cause serious adverse events, often require unique drug delivery systems, and require regular dose and monitoring. Because of this, new and evolving treatments may increase exercise capacity and pulmonary hemodynamic, but they may or may not also improve quality of life.[4]

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Takayasu's Arteritis Presenting with Seizure: A Case Report

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Abstract:

Takayasu's Arteritis (TA) is a rare Autoimmune condition characterized by large vessel vasculitis that affects the chronic inflammation of large arteries (aorta) and its branches. This is also called a pulseless disease primarily affects young women at child-bearing age. It is most commonly manifest with clinical symptoms related to arterial stenosis, occlusion, aneurysm formation, and neurological complications are relatively rare. The prevalence of TK is 2.6 – 6.4 people per million population. The etiopathogenesis is unknown and the neurologic complications are uncommon and seizures presenting in this patient are even rare. We present a case of young adult women with Takayasu arteritis who developed seizures as a complication. This case report discusses the clinical presentation, diagnostic challenge, and standard treatment pattern along with angioplasty or bypass surgery to restore the normal flow through the aorta.

Keyword:

Takayasu's Arteritis, Vasculitis, Pulseless disease, Arterial stenosis, HLA Gene, Vessel Granulomatous Vasculitis, Natural Killer Group 2 Member D

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CASE REPORT OPEN ACCESS

Plummer-Vinson Syndrome: A Rare Case Report

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ABSTRACT

Plummer-Vinson syndrome, also called Paterson-Kelly syndrome, is characterized by the classic triad of dysphagia, iron-deficiency anemia, and esophageal webs. This syndrome is associated with an increased incidence of post-cricoid carcinoma and for surveillance, an endoscopy is recommended under general anesthesia. This was a case of 74-year-old woman with Plummer-Vinson Syndrome who was successfully treated with Savary-Gilliard (SG) dilation or Esophageal dilation. The patient had a long-standing clinical history of iron deficiency anemia with slow progression of dysphagia of solid food from 10 years and glossoepiglotic fold, aryepiglottic fold bilaterally arytenoid on the left & right side and had experienced difficulty in swallowing for the past 10 years. Along with this patient is having abdominal pain radiating to the epigastrium region and fever with chills & rigors. An endoscopy examination was conducted under general anesthesia and revealed the esophageal web at the level of the cervical esophagus. Laboratory data investigation shows an RBC count of 2.09 million/cumm, haemoglobin of 6.6 gm/dl%, and serum iron of 7µg/dl. The patient was prescribed Inj. Orofer-XT 100 mg intravenous iron sucrose supplement daily for 15 days, Inj. Pantoprazole 40 mg daily for 1 week, Inj. Tramadol 1amp whenever required and Syp.Sucralfate 15 ml 30 minutes before food. Her anemia condition was improved but dysphagia did not improve. To treat dysphagia the Savary-Gilliard (SG) dilation was done under fluoroscopy by endoscopically a single session was performed that serially increased the diameter by disrupting the web without any complication. After SG-dilation, the patient's dysphagia resolved shortly after the treatment.

Introduction

Plummer Vinson Syndrome (PVS), also called Paterson-Kelly syndrome, is characterized by the classic triad of dysphagia, iron-deficiency anemia and esophageal webs. The exact epidemiology of this syndrome is unknown, but it has become extremely rare. The condition is becoming less common in developed countries, but it is becoming more common in developing countries, especially in Asia. Iron deficiency is relatively common in African countries, but this syndrome is very rare [1]. Improvements in the nutritional status in the nations where Plummer-Vinson syndrome was previously reported have been proposed as the cause of the decline in the syndrome's prevalence [2].

It is more common in middle-aged women and usually affects perimenopausal women. It is linked to a higher risk of squamous cell carcinoma of the pharynx and proximal esophagus. It is referred to as Paterson-Brown-Kelly syndrome in the United Kingdom. The two British laryngologists who published their research in 1919, Adam Brown-Kelly (1865–1941) and Donald Ross Paterson (1863–1939), were honoured by this name [3,4]. Autoimmunity, genetic predisposition and dietary and iron deficits are some of the hypothesized etiopathogenic processes [5]. When iron deficiency repeatedly damages epithelia, it causes mucosal atrophy and pharyngeal muscle deterioration, which eventually results in the formation of esophageal webs. The esophageal web is asymmetrically linked to the anterior esophageal wall and is located beneath the cricopharyngeal muscle. Squamous epithelia make up the thin mucous membrane known as the esophageal web [6,7].

The widely accepted theory of iron insufficiency is still debatable. Previous studies have linked iron deficiency to the development of esophageal webs and dysphagia in people who are prone to it. Depletion of iron-dependent oxidative enzymes can lead to atrophy of the esophagus mucosa, the production of webs as an epithelial consequence and myasthenic alterations in the swallowing mechanism's of muscles. Plummer-Vinson syndrome has an enigmatic cause. Nutrient deficiencies, or the absence of specific nutrients, may have an impact, as well as genetic variables. It is an uncommon condition that has been connected to throat and esophageal malignancies. It affects women more frequently. The

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Formulation And Development Of Antifungal Herbal Ointment With Melia Azardichta And Curcuma Longa Containing Plant Extract

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KEYWORDS
Physiochemical parameters, antifungal activity, plant illnesses, spread ability, extrudability ect.

ABSTRACT:
Even in places where modern treatment is readily available, the utilization of herbal remedies has witnessed a significant surge in fascination over the past few years. A lot of people are interested in phytochemicals and herbal medicines lately because these substances are derived from medicinal plants, which are a source of bioactive compounds utilized in both conventional and alternative medicine. The purpose of this study is to create and test an ointment containing Azadirachta indica and Curcuma long a plant extracts. The extract was blended with the base using the levigation procedure to generate the ointment after the ointment base was prepared. When it was finished, the formulation's physicochemical properties—such as color, fragrance, pH, spread ability, extrudability, consistency, solubility, and washability—were evaluated. After it was ready, the formulation was assessed for physicochemical characteristics such color, smell, pH, spread ability, extrudability, consistency, solubility, and washability. Further stability testing of the formulation at various temperatures indicated no alteration in irritancy, spread ability, or diffusion. As a result, it might become a medium for efficiently and readily utilizing the therapeutic properties of Melia azardichta and Curcuma longa in a simple dose form.

1. Introduction

Medicinal or pharmaceutical chemistry is a branch of chemistry and pharmacology concerned with the design, synthesis, and development of pharmaceutical medications. The identification, production, and development of novel chemical entities appropriate for therapeutic use is the focus of medicinal chemistry [1-2]. It also involves the investigation of already available pharmaceuticals, their biological features, and their Structure-activity correlations in quantitative terms (QSAR). Pharmaceutical chemistry focuses on the effectiveness of medications and the suitability of medical equipment for the uses for which it is intended [3].

The role of medicinal plants in the pharmaceutical industry

synthetic chemistry, combinatorial chemistry, molecular modeling, and separation from plants and other natural sources of novel chemical entities have all been used to obtain molecules for drug development [4]. About a quarter of top-selling medications globally in 2001 and 2002 were either natural ingredients themselves or were derived from them. [5].For lead development, lead optimization, and clinical studies, the quantities of

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Docking Studies, Synthesis, SAR and Anti-TB Activity of Glycinamido Analogues

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Mycolic acid is a crucial component of the *Mycobacterium tuberculosis* cell wall and mycolic acid methyltransferases (MAMTs) are essential for mycolic acids to mature. In the present study, an inhouse library of 330 ligands was designed taking glycinamido moiety as scaffold. Virtual screening was carried out with this library of compounds against MmaA1 as the target protein. About 55 hits were identified through docking, ADMET studies and these molecules were synthesized by the Schotten-Baumann reaction followed by a nucleophilic substitution reaction. All the compounds were subjected to *in vitro* anti-Tb screening by microplate alamar blue assay (MABA). The Mdb1, Mdb4 & Meb1 exhibited excellent activity against *M. tuberculosis* H37Rv bacilli strain with an MIC of 1.56 µg/mL. The SAR studies shows that the aryl ring attached directly to the nitrogen atom as present in 2(-N-substituted glycinamido) derivatives is essential for the compound to exhibit potent anti-TB activity.

Keywords: Glycinamido derivatives, Mycolic acids, Docking studies, *Mycobacterium tuberculosis*.

INTRODUCTION

The bacillus *Mycobacterium tuberculosis* is the primary cause of the deadly disease tuberculosis (TB). Tuberculosis patients cough out bacteria into the air, spreading the disease [1,2]. Most TB cases (pulmonary TB) involve the lungs, however, extrapulmonary TB can affect other parts of the body as well. According to the WHO TB Report 2022, 10.6 million people (95% UI: 9.9-11 million) are predicted to have contracted TB globally in 2021, an increase of 4.5% from 10.1 million (95% UI: 9.5-10.7 million) in 2020 [3], which indicates that the years of reduction have now reversed. At this time, drug-resistant tuberculosis (DR-TB) continues to threaten public health. Multidrug-resistant tuberculosis (MDR-TB) is characterized by resistance to rifampicin and isoniazid [4]. In order to treat both Rifampicin-resistant tuberculosis (RR-TB) and multidrug-resistant tuberculosis (MDR-TB), second-line medicine is required. In 2021, three nations accounted for 42% of the world's MDR/RR TB cases, with India accounting for 26% [5]. New drugs with novel mechanisms are therefore urgently required to treat TB, shorten the period of MDR-TB and RR-TB treatment and effectively aid in TB control [6,7].

The cell wall of *M. tuberculosis* is composed of a peptidoglycan (PG) layer that is covalently connected to arabinogalactan (AG), which acts as an attachment site for certain mycolic acids (MA). The cell wall core is commonly known as mycolyl-arabinogalactan-peptidoglycan (mAGP) complex [8]. The primary virulence factor is the mycolic acids, which provide *M. tuberculosis* an inherent resistance to most antibiotics [9]. The main regulators of *M. tuberculosis* cell wall formation are fatty acid synthases (FAS-I, FAS-II, KasA, KasB, MabA, InhA, HadABC), mycolic acid modifying enzymes (SAM-dependent methyltransferases), fatty acid activating and condensing enzymes (FadD32, Acc, Pks13), transporters (MmpL3) and transferases. FAS-I is involved in fatty acid production in eukaryotes, whereas FAS-II is only found in *M. tuberculosis* cells and is a target of anti-TB medicine [10]. Because these enzymes have no homologs in the mammalian system, enzymes involved in cell wall synthesis afford a plausible molecular target for fighting tuberculosis.

Methyl transferases, modify the meromycolyl chain through cyclopropanation and methylation. *M. tuberculosis* requires these alterations to maintain its pathogenicity, virulence and persistence [11]. Methyl transferase enzymes also help in the

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(RESEARCH ARTICLE)

Check for updates

Evaluation of analgesic and anti-inflammatory activities of ethanolic fruit extract of *Terminalia chebula*

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Abstract

Analgesic and Anti-inflammatory activities of ethanolic fruit extract of *Terminalia chebula* was evaluated using tail-flick method, eddy's hot plate method, acetic acid induced writhing responses and *in-vivo* anti-inflammatory property was determined using carrageenan rat paw edema. The ethanolic fruit extract of *Terminalia chebula* at different concentrations significantly inhibited the nociception in comparision with different standard drugs that showed anti-nociception. The test extract also reduced the edema induced in rats using carrageenan paw edema method as compared with the standard drug Diclofenac sodium 10mg/kg. The results obtained in this research study found to be very significant when compared to standard reference drug.

Keywords: *Terminalia chebula*; Analgesic; Anti-inflammatory activity; Standard Reference Drugs

1. Introduction

The medicinal plant *Terminalia chebula* [1-6], belonging to the family Combretaceae commonly known as Black or Chebulic Myrobalan also termed as King of Medicines is used to cure all kind of the diseases. This plant is abundantly available in remote areas of Yeleswaram and Rampachodavaram forest areas. The local natives are using the decoction of *Terminalia chebula* for the treatment of arthritic, anti-parasitic, anti-bacterial and as wound healing agent. Based on the available sources the researcher made a sincere attempt to explore the biological activities.

2. Materials and methods

2.1. Collection of Plant

The medicinal plant *Terminalia chebula* was collected from interior parts of Yeleswaram and Rampachodavaram forest sources of East Godavari District and the plant was authenticated by Taxonamist Prof Dr. S B Padhal.

2.2. Preparation of the Extract

The fruit of the plant was dried under shade, coarsely powdered and was subjected to extraction process using soxlet apparatus with ethyl alcohol for 72 hours. The solvent was evaporated and the crude extract powder was used for few days and this extract powder was used for the evaluation of analgesic and anti-inflammatory activities.

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Review Article

AI-Driven Natural Language Processing in Healthcare: Transforming Patient-Provider Communication

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ABSTRACT

Healthcare communication is the lifeblood of effective patient care. The ability of patients and providers to exchange information, comprehends diagnoses, and collaboratively make decisions directly influences healthcare outcomes. In this context, AI-powered NLP has emerged as an invaluable agent of change, revolutionizing the way medical information is conveyed, understood, and acted upon. Through a comprehensive exploration, this review article unpacks the multifaceted facets of AI's role in healthcare communication. It begins by elucidating the essence of AI-powered NLP, providing readers with a foundational understanding of these transformative technologies. Subsequently, it delves into the myriad benefits that AI brings to the table, ranging from improved patient engagement and accessibility to streamlined clinical documentation and augmented diagnosis and treatment support. However, it's not all progress without pause. This review also delves into the ethical considerations intrinsic to AI in healthcare communication, such as safeguarding patient privacy and addressing bias and equity concerns. As the review work unfolds, it scrutinizes the challenges that must be surmounted to effectively implement AI-driven communication solutions in healthcare settings while casting a visionary gaze into the future, discerning the uncharted horizons where AI might further elevate healthcare communication.

Keywords: AI, Natural Language Processing, Healthcare, Patient-Provider Communication, Quality of Care, Patient Experience.

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INTRODUCTION

In the intricate tapestry of healthcare, one thread stands out as absolutely vital-communication. Effective and compassionate communication is the linchpin that holds together the patient-provider relationship, underpins diagnostic and treatment decisions, and ultimately shapes healthcare outcomes.[1] In this review article, we embark on a journey to explore how Artificial Intelligence (AI) and Natural Language Processing (NLP) technologies have become formidable forces in revolutionizing patient-provider communication.

Setting the Stage: The Crucial Role of Communication in Healthcare

Imagine a scenario where a patient's symptoms are misunderstood, a crucial medical history detail is overlooked, or a treatment plan is not clearly conveyed. In healthcare, such communication breakdowns can have profound consequences, impacting patient safety, satisfaction, and even recovery.[2] Therefore, it is essential to recognize that communication is more than just the exchange of words; it's the conduit through which trust is built, medical information is conveyed, and care is delivered. The gravity of this matter is underscored by staggering statistics on communication-related medical errors and their human toll. Realizing the significance of clear, empathetic, and effective communication in healthcare sets the stage for appreciating the transformative potential of AI and NLP in this context.[3]

The Emergence of AI and NLP in Healthcare

Our world has witnessed an exponential surge in healthcare data, driven by Electronic Health Records (EHRs), wearable devices, and the digitization of medical information. With this data deluge comes an unprecedented opportunity to harness AI and NLP technologies. These technologies are more than buzzwords; they are the result of decades of research, development, and the convergence of computational power and medical knowledge.[4]

AI in healthcare is no longer a distant dream but a tangible reality. From diagnosing diseases to predicting patient outcomes, AI is making its mark across the healthcare spectrum. NLP, a subfield of AI, focuses on the interaction between computers and human

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Research Article

Design Formulation And Evaluation Of Anti Migraine Mouth Dissolving Tablets Using Different Superdisintegrants

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ABSTRACT

Through the application of novel approaches to the administration of medication, the purpose of this study is to enhance the safety, efficacy, and rate of action of the existing molecule. Orally disintegrating pills containing rizatriptan benzoate were manufactured by the direct compression process in order to provide migraine sufferers with a more expedient means of obtaining relief. A 32-factororial design approach was utilized in this investigation, and eight distinct formulations were evaluated for each of the super disintegrants that were investigated. The created batches of tablets were subjected to a series of examinations, including weight variation, hardness, friability, wetting time, invitro dispersion time, drug content, and invitro dissolution. In order to determine the dose form of Rizatriptan Benzoate tablets, a UV spectrophotometric method that is uncomplicated, sensitive, rapid, accurate, cost-effective, and repeatable was developed. At a wavelength of 225 nm, rizatriptan benzoate exhibits the highest absorbance, and its molar absorption is measured at 1.619 Ao. The application of Beer's law was seen between 1 and 10 µg/ml. The findings of the analysis were validated by conducting statistical analysis and recovery studies. In order to validate the method, several different criteria were utilised, including linearity, accuracy, limit of detection (LOD), limit of quantification (LOQ), Sandell's sensitivity, and specificity. Through the use of the recommended method, it was discovered that the procedure of estimating the regular dosage of Rizatriptan Benzoate in both tablet and bulk forms is one that is accurate and precise. The optimised formulation took between fifteen and thirty seconds to spread throughout the body. In addition to this, it displayed a higher water absorption ratio and also released 99.60% of the medicine over a period of two minutes and fifteen seconds.

Key Words: Rizatriptan, LOQ, LOD, ODDS

Introduction

Oral administration is by far the most common and favoured mode of drug delivery, regardless of whether the medication is administered in solid or liquid form. Solid dosage forms, on the other hand, are popular because of the numerous benefits they offer, which include patient compliance, the avoidance of discomfort,

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REVIEW ARTICLE

Nanorobotics: Pioneering Drug Delivery and Development in Pharmaceuticals

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ABSTRACT:

Nanorobotics, a rapidly evolving field at the intersection of nanotechnology and robotics, holds immense promise in revolutionizing pharmaceutical drug delivery and development. This comprehensive review article explores the various facets of nanorobotics and its pivotal role in the advancement of medicine. The article begins with an introduction to nanorobotics, providing a definition and historical background to contextualize its significance. Subsequently, it delves into nanorobotics' role in drug delivery, highlighting the challenges faced in conventional methods and the advantages of employing nanorobot-based systems. The review further explores nanorobotics in drug development, emphasizing its contribution to accelerating drug discovery and enabling personalized medicine. It discusses the different types of nanorobots utilized in pharmaceutical applications, including molecular, cellular, and hybrid systems. Additionally, the article covers the fabrication and propulsion techniques of nanorobots, along with navigation and control strategies. Furthermore, it delves into the interaction of nanorobots with biological systems and their potential applications in site-specific drug delivery and disease treatment. Ethical and regulatory considerations pertinent to nanorobotics in pharmaceuticals are also addressed. Finally, the review offers insights into future perspectives and challenges in the field, envisioning advanced drug delivery systems, targeted therapies, nanorobot swarms, and biohybrids. By comprehensively examining the subject, this review article presents a holistic understanding of nanorobotics potential in reshaping pharmaceutical practices for precision medicine and improved patient outcomes.

KEYWORDS: Nanorobotics, Drug Delivery, Drug Development, Precision Medicine, Targeted Therapies.

INTRODUCTION:

Nanorobotics refers to the field of science and technology that focuses on designing and building nanoscale robots or machines, typically at the molecular or cellular level. These nanorobots possess unique properties and functionalities, allowing them to perform precise tasks and interact with biological systems at the nanoscale.

The scope of nanorobotics extends across various disciplines, including medicine, electronics, materials science, and more, with particular significance in pharmaceuticals for drug delivery and development. The concept of nanorobotics finds its roots in the visionary ideas put forward by renowned physicist Richard Feynman in his famous 1959 lecture, "There's Plenty of Room at the Bottom." Feynman discussed the possibilities of manipulating individual atoms and molecules, inspiring the development of nanotechnology and nanorobotics. The field witnessed significant advancements over the decades, driven by breakthroughs in nanoscale fabrication, nanomaterials, and control

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JOURNAL OF PHARMA INSIGHTS AND RESEARCH

RESEARCH ARTICLE

Orodispersible Films for Enhanced Bioavailability of Carvedilol

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Abstract: Orodispersible films (ODF) represent an innovative approach in drug delivery systems, offering solutions to enhance patient compliance and address challenges associated with traditional dosage forms. Particularly beneficial for patients with swallowing difficulties, ODFs can be easily ingested without the need for water, chewing, or swallowing. Carvedilol, characterized by low bioavailability due to hepatic first-pass metabolism, prompted the focus of this research on developing carvedilol ODFs to enhance its bioavailability. Employing the solvent casting method, carvedilol ODFs were formulated employing the film-forming polymer hydroxypropyl methylcellulose (HPMC). Comprehensive evaluations were conducted, including assessments of physical attributes, weight variation, film thickness, folding endurance, surface pH, swelling properties, water permeation, tensile strength, disintegration, drug content, and in vitro dissolution studies. Optimization of the formulation was achieved through a systematic trial and error approach. The preparation involved dissolving HPMC (50/5 cps) in methanol, with the addition of polyethylene glycol (PEG) and propylene glycol (PG) to attain a homogeneous mixture. After incorporating the drug and excipients, entrapped air was removed, and the solution was cast onto microscopic glass slides and dried at room temperature. The resulting film was divided into halves, each containing 10mg of the drug. Six formulations (F1 to F6) were developed using the solvent casting technique, with formulation F4 emerging as the optimal choice based on assessments of drug content and dissolution studies. This study shows the potential of carvedilol ODFs as a promising strategy to enhance its bioavailability and therapeutic efficacy.

Keywords: Carvedilol; Orodispersible films; Bioavailability; First-pass metabolism; HPMC

1. Introduction

Orodispersible films (ODFs) represent a recent advancement in dosage forms designed to facilitate the release of medication in the oral cavity, eliminating the necessity for water or chewing. This innovative delivery system holds significant promise in enhancing drug bioavailability and simplifying administration, particularly for patients with mental illness or those in a coma state, where traditional oral medications may present challenges [1,2]. One of the key advantages of ODFs lies in their ability to bypass first-pass metabolism, allowing the drug to enter the systemic circulation directly, thereby facilitating rapid onset of action [3,4]. This direct absorption route can lead to improved therapeutic outcomes and enhanced patient compliance. Moreover, ODFs offer versatility in dosing, allowing for precise control over the release kinetics of the active ingredient by adjusting the type, concentration, and ratios of polymers and other components in the formulation [5-7].

Carvedilol, a β-blocker indicated for the treatment of hypertension, heart failure, and angina, presents a compelling case for formulation as an orodispersible film. Oral administration of carvedilol is associated with low bioavailability due to the significant first-pass hepatic effect. Consequently, the development of an ODF formulation offers a strategic approach to mitigate this limitation and optimize therapeutic efficacy [8]. Several manufacturing methods are available for the production of fast-dissolving films, each offering unique advantages and considerations. These include the solvent casting method, rolling method, solid dispersion method, and hot melt extrusion [9]. Among these techniques, the solvent casting method is widely utilized for its simplicity, scalability, and ability to accommodate a broad range of drug and polymer combinations. By dissolving the polymer and active ingredient in a suitable solvent, followed by casting and drying, uniform films with tailored drug release profiles can be achieved.

The rolling method involves the preparation of a homogeneous blend of drug and polymer, which is then compressed between two rollers to form thin films. While this technique offers advantages in terms of efficiency and reproducibility, it may be less suitable for heat-sensitive drugs due to the mechanical force involved in the process. In contrast, the solid dispersion method

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METHOD DEVELOPMENT AND VALIDATION FOR RITONAVIR AND DARUNAVIR BY RP-HPLC METHOD

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[1,2]Assistant professor, [3]Associate professor
Department of Pharmaceutical Analysis
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Surampalem, India Abstract:

Abstract:A new, simple, precise and accurate method was developed and validated for the simultaneous estimation of ritonavir and Darunavir in tablet dosage form using RP- HPLC. The separation is achieved by using Xterra C18 (4.6*150mm,5µ) column. 0.1%TFA: methanol is used as mobile phase in a ratio of 60:40 at a flow rate of 1.0ml/min. the column is maintained at ambient temperature. The wavelength of both drugs measured at 220nm. Run time is maintained for 10 min. Retention time of Ritonavir and Darunavir was found to be 2.461min and 4.387min. %assay of Ritonavir and Darunavir was found to be 99.59% and 99.96% respectively. Linearity lies from10µg/ml to 50µg/ml for ritonavir and 60µg/ml to 300µg/ml for darunavir. It is concluded that our method is capable of producing good sensitivity. This method is useful for routine analysis.

Index Terms— Darunavir, Ritonavir, wavelength, RP-HPLC,UV-Spectroscopy.

I. INTRODUCTION (HEADING 1)

Ritonavir is chemically, 3-thiazol-5-ylmethylN-[(2S,3S,5S)-3-hydroxy-5-[(2S)-3-methyl-2-

{[methyl({[2-(propan-2-yl)-1,3-thiazol-4-yl]methyl})carbamoyl]amino}butanamido]-1,6diphenylhexan-2-yl]carbamate is an HIV protease inhibitor that interferes with the reproductive cycle of HIV. Although it was initially developed as an independent antiviral agent, it has been shown to possess advantageous properties in combination regimens with low-dose ritonavir and other protease inhibitors. Indicated in combination with other antiretroviral agent darunavir for the treatment of HIV-1 infection. Darunavir is chemically(3R,3aS,6aR)- hexahydrofuro[2,3-b]furan-3-ylN-[(2S,3R)-3-hydroxy-4-[N-(2-methylpropyl)4-aminobenzenesulfonamido]-1-phenylbutan-2-yl]carbamate is a protease inhibitor . combination of these two drugs PRIZESTA is used to treat HIV. It acts on the HIV aspartyl protease which the virus needs to cleave the HIV polyprotein into its functional fragments. Ritonavir and Darunavir are existing drugs. Literature reveals that different methods for their analysis in their formulations. after a detailed study the work is to develop a new, simple, precise& accurate method for its analysis in formulation. a new RP- HPLC method was decided to be developed and validated.

Chemical structure of ritonavir and darunavir

FIG:1

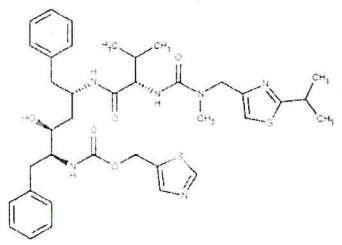
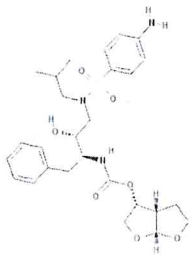


FIG:2



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Original Article

Assessment of Antihyperglycemic and Hypolipidemic Activities of Peel Extracts of *Annona squamosa, Actinidia deliciosa* and Other Two Fruits in Alloxan-induced Diabetic Rats

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ABSTRACT

Objectives: This study aims to assess the potential antidiabetic properties of aqueous extracts derived from the peels of specific fruits, including *A.squamosa, C. melo, A. deliciosa* and *M. pumila*.
Materials and Methods: Male rats of the Wistar albino strain, weighing 180-200 g, were divided into 12 groups, with one group as the control. Diabetes was induced using alloxan, followed by treatment with fruit peel extracts and a polyherbal mixture. After a 28-day experimental window, the rats were euthanized and specimen pancreatic tissues and blood samples were analyzed.
Results: The findings indicated that blood glucose concentrations were substantially reduced by all selected extracts and the polyherbal mixture. Moreover, they demonstrated positive effects on serum lipid profiles, decreasing triglycerides, total cholesterol, LDL and VLDL, while increasing HDL levels and insulin concentrations. Notably, the polyherbal mixture and *M. pumila* (apple) peel extract exhibited robust anti-diabetic effects, even at lower doses, surpassing the other three extracts. Results were correlated strongly with histopathological analysis of pancreatic tissue.
Conclusion: This study highlights the considerable therapeutic potential of selected extracts of the fruit peels and their mixture in diabetes management. Their ability to mitigate pancreatic damage positions them as promising candidates for the development of potent antidiabetic agents.

Keywords: Fruit peels, Alloxan, Hyperglycemia, Hypolipidemia, Polyherbal mixture.

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INTRODUCTION

Diabetes Mellitus (DM) is a common non-communicable disease characterised by extreme resistance to insulin, giving rise to oxidative stress.[1] Hyperglycemia arises from disrupted glucose metabolism due to insufficient insulin, leading to oxidative stress and heightened lipid peroxidation. These factors contribute to the development of secondary complications associated with diabetes. Diabetes is a growing epidemic and a major health concern, ranking third after cancer and cerebrovascular diseases.[2]

In 2015, approximately 415 million people had DM, with a projected rise to 642 million by 2040 in emerging economies.[3] The economic impact of Diabetes Mellitus (DM) is significant, with an approximate expenditure of $673 billion in 2015, constituting 12% of the global health budget for that period. While diabetes is acknowledged as a public health concern primarily in urban regions of emerging economies, recent information reveals a growing prevalence of diabetes in rural areas as well.[4] In 2015, India recorded 69.1 million individuals affected by DM, positioning it with the second-highest number of diabetes cases globally, after China.

DM-specific complications include retinopathy; nephropathy and neuropathy, causing substantial morbidity among patients with both type I and type II Diabetes Mellitus.[5] Conventional treatments for diabetes primarily involve lifestyle management and oral hypoglycemic medications, focusing on glucose level regulation rather than disease reversal. This underscores the continued quest for effective diabetes treatments.[6]

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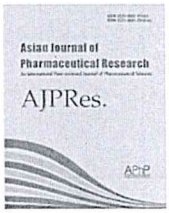

RESEARCH ARTICLE

Exploring Aquasomes: A Promising Frontier in Nanotechnology-based Drug Delivery

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ABSTRACT:

Nanotechnology has revolutionized the field of drug delivery, providing novel strategies to enhance drug efficacy and reduce side effects. Among these advancements, Aquasomes have emerged as promising nanocarriers, representing a unique class of colloidal delivery systems. Aquasomes are three-dimensional, self-assembling nanocomposites composed of a solid core coated with a layer of biocompatible polymers and stabilized by surfactants. Notably, the hydrophilic nature of Aquasomes allows them to encapsulate hydrophobic drugs, thereby overcoming solubility and stability challenges commonly associated with conventional drug formulations. The versatility of Aquasomes in encapsulating a wide range of drug molecules, including small molecules, proteins, and nucleic acids, expands their potential in various therapeutic areas. The applications of aquasomes are examined in targeted drug delivery, enabling site-specific release and minimizing off-target effects in this review. Moreover, the advantages of Aquasomes in improving drug stability and bioavailability are analyzed, and comparative assessments with other nanocarriers are presented. The potential challenges and ongoing research efforts to optimize Aquasome formulations for clinical translation are also discussed. Aquasomes offer a promising outlook for nanotechnology-based drug delivery, showing great potential in addressing existing limitations of conventional drug formulations. The constant progress in Aquasome research fuels optimism for their integration into mainstream therapeutics, revolutionizing medical treatments and patient outcomes.

KEYWORDS: Aquasomes, Nanotechnology-based drug delivery, Targeted drug delivery, Nanocarriers, Biocompatibility, Stimuli-responsive Aquasomes.

INTRODUCTION:

Nanotechnology has emerged as a groundbreaking field with transformative potential in various scientific disciplines, and its applications in medicine have sparked a revolutionary shift in drug delivery strategies[1].

The quest for safer, more efficient, and targeted drug delivery systems has driven researchers to explore innovative nanocarriers capable of overcoming traditional pharmaceutical limitations. Among the various nanotechnology-based solutions, Aquasomes have captured significant attention and intrigue as a promising frontier in nanotechnology-based drug delivery[2].

Conventional drug delivery systems often face challenges related to poor solubility, limited stability, low bioavailability, and non-specific targeting, leading to suboptimal therapeutic outcomes and increased side effects. The introduction of nanocarriers aimed to tackle