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A REVIEW ON PHYTOPHARMACOLOGICAL ACTIVITIES OF *ALPINIA MUTICA* AND *TRADESCANTIA SPATHACEA*

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Abstract

Alpinia Mutica plant, belongs to family Zingiberaceae, is mainly scattered in tropical areas and widely known for ethno medicine. Its rhizome extract has maximum inhibitory effect against fungi as well as bacteria. *A.mutica* is also used in medicine and food preparations. Rhizome extract own more phenolic and flavonoid substances when estimated and compared to leaf extract of plant with evident antimicrobial as well as radical scavenging potential. The greater part of the crude extracts and isolated compounds indicated antimicrobial, Antioxidant activities which are determined by diphenyl picryl hydrazyl radical scavenging action test (DPPH), Bleaching of β-carotene, (SOD) superoxide dismutase. Additionally, these mixes are fit to stop the advancement of colon neoplasm cells. *Tradescantia spathacea* is an herb of India, used as conventional remedy and it is under the belonging to family Commelinaceae. In Mexican country which is called as "Maguey Morado" (Purple Maguey), elixir of the leaf is regularly free-eaten as healing of endoplasmic carcinoma. Ethanolic extract of the plant has chemical constituents like anthocyanin, flavonoids, saponins, carotenoids, terpenoids and steroid compounds. The successive solvent extract of this plant has antioxidant activity, antimicrobial properties and also found to block antiadrenergic action of bretylium tosylate and showed contraceptive effect in experimental animals (rats). It is used in cosmetics to nourish skin.

Key words: *Alpinia Mutica*, *Tradescantia spathacea*, Phytochemical and Pharmacological activities.

Introduction

Plants are used as a primary source of treatment for many diseases from the ancient times and number of plants are known to have different medicinal activities. (Kakkar *et al.*, 2014). From the olden day's plants were used by all cultures of the world wide with India that has one of the ancient, prosperous and highly multiple cultures (Tandon *et al.*, 2004). Plant drugs have beneficial activity in analysing and treating more ailments in standard jurisdiction (Steven D. Ehrlich *et al.*, 2009). Medicinal value plants have various pharmacological activities such as antioxidant, anticancer, immunostimulant, anti-inflammatory, liver protective activity and spinal reflection activities. (Chang *et al.*, 2010).

Alpinia is the largest genera of the Zingiberaceae family, with about two hundred and thirty herbs widely distributed in peculiar and sub-peculiar Asia. The plant has been reported to have 9 species of plants in southern India. (John Kress *et al.*, 2005, Sabu *et al.*, 2006). *Alpinia Mutica* (A.M) is a perennial herb which produce horizontal, underground stem, fragrant plant indigenous to Malayan and Kingdom of Thailand. Although a few changes can be seen in farming, the sorted varieties are spread in northern Malaysia. Although there are some alternatives to A.M in agricultural sources, a variety of species are spread in the northern end of the Malayan foreland. Importantly, these plants are used by locals to treat gas problems in stomach and fruits are used to reduce swelling (Halijah Ibrahim *et al.*, 2014).

A.M rhizomes showed the presence of flavokawain B, pinocembrins, 5, 6-dehydrokawain and 1, 7-diphenyl-5-hydroxy-6-hepten-3-one (Sirat *et al.*, 1996) and methylene chloride extract was used for lipid oxidation and observed for the inhibition of growth of *Bacillus subtilis* and *Staphylococcus aureus* species (Mohamad *et al.*, 2004).

Tradescantia spathacea sw (T.S) is vegetative plant

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A Review on Nano Drug Delivery Systems of Herbal Medicine

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Abstract: Herbal medicines are widely used around the world since history. The advancement of phytochemical and phytopharmacological sciences has enabled elucidation of many medicative plant products' composition and biological activities. The effectiveness of the many species of medicative plants depends on the provision of active compounds. Most of the biologically active constituents of extracts, like flavonoids, tannins, and terpenoids, are extremely soluble in water; however, have low absorption, as a result of their unable to cross the lipoid membranes of the cells, have enormous molecular size, or poorly absorbed, ading to loss of bioavailability and effectiveness. Some extracts are not used clinically due to these obstacles. It has been wide planned to mix seasoner medication with herbal, resulting from nanostructured systems that may be ready to enhance plant extracts' action, reduce the specified dose and facet effects, and raise activity. Nanosystems will deliver the active constituent at a spare concentration throughout the whole treatment amount, directional it to the required web site of action. Typical treatments do not meet these necessities. This study aimed to review nanotechnology-based drug delivery systems and herbal medicines.

Keywords: Natural products, herbal medicines, nanotechnology, drug delivery systems, biological activity

1. Introduction

Knowledge and use of plants as seasoner medicines have occurred in numerous populations throughout human evolution, starting once the man learned to pick out plants for food and alleviate ailments and diseases.[1] However, throughout the last half of the 20th century, seasoner medicines were bit by bit replaced by allopathic medicines, particularly within the Western world. Allopathic treatments square measure presently a lot of wide used than ancient medicines, particularly in developed countries. However, most developing countries still use these natural medicines, presumably that getting a synthetic drug is pricey[2]. in line with the globe Health Organization, eightieth of individuals in developing countries rely upon ancient healthful practices to fulfill and/or supplement their basic health desires[3].

Despite marketing and encouragement from the pharmaceutical trade throughout allopathic medicines, an oversized phase of the population in several countries continues to utilize complementary practices for their health care. Several of those practices are derived from healthy plants. However, thanks to economic, political, and social changes worldwide, the therapeutic use of these natural resources, which are mainly utilized by people who cannot afford different treatments, has dramatically diminished[1,4].

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PHARMACOGNOSTIC EVALUATION OF LEAF, STEM AND ROOT OF *TALINUM CUNEIFOLIUM LINN*

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ABSTRACT

A wide range of pharmacological activities have been reported for the erect shrub with subterranean tuber, *Talinum cuneifolium*. The presents paper of a Pharmacognostic evaluation of leaf, stem and root of *Talinum cuneifolium* Linn (portulaceae); the investigations focused at macroscopic, microscopic characters of leaf, stem, root and powder. Microscopy of *Talinum cuneifolium* leaf showed the presence of midrib, mucilage filled idioblast, xylem, phloem, paracytic stomata and guard cells. Wide cortex, periderm, starch grains and calcium oxalate crystals were present in microscopy of root. Powder microscopy showed the presence of calcium oxalate druses and small fragments of lamina. This forms a fundamental basis for developing histological standards of raw materials and its characterization of medicinal botanicals.

INTRODUCTION

Over the last decade era, there has been aemergent interest in drugs of herbal origin in divergence to the synthetics that are viewed as unsafe to human and environment[1] .Now days, Herbal medicines are manufactured on large scales where the manufacturers are facing problems such as availability of good quality raw material because of adulteration, substitution(intentionally and unintentionally), authentication of raw material, availability of standards, proper standardization methodology of drugs and formulation i.e. quality control parameters[2] . Many researchers indicate both the macro and microscopic characters often help in correct identification of crud drug[3]. *Talinum Cuneifolium* Linn. of the family Portulaceae is commonly known as Ceylon bachali in English, Palaku, Akukoora, Seema bachali in Telugu, Pasali in Tamil. This plant is commonly found in Andhra Pradesh and TamilNadu region of India, Srilanka, Bangladesh, Pakistan, U.S.A., Puerto Rico and Virgin Islands. Leaves and roots are medicinally important parts. Powdered leaf contain been reported to exhibit several cfficacics for different conditions including diabetes[4], inflammation[5], hepatitis, mouth ulcers and is also an aphrodisiac[6]. The fresh leaves are used as stomachic. Roots possess tonic properties, used in treatment of cough, gastritis and pulmonary tuberculosis. They are also used to treat dehydrating diarrhea. With the above uses, we found *Talinum cuneifolium* as an important medicinal botanical, so it can be easily adulterated with low grade or other species if the supply of

REVIEW ARTICLE

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Coronavirus Treatment: Newer Therapeutic Development of Covid-19 Drugs and Vaccines

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Abstract: The new coronavirus (Covid-19) has infected more than 85,000 people in central China, spreading outbreaks in more than 201 countries, territories and major countries affected are Italy, Spain, USA, Iran, South Korea, Japan and now threatening to travel across the globe as a pandemic. Coronavirus is zoonotic, transmitted between animals and humans. In more severe cases, pneumonia, severe acute respiratory syndrome, kidney failure and even death may result from infection. 31,000 death cases have been reported around the world so far and the number is increasing every day. While there is still no effective cure for the virus and the pneumonia it causes, according to the World Health Organization, there are more than 50 medications or drug combinations that are potentially worth trying. Clinical studies of a few medications such as remdesivir, favilavir, atazanavir, oseltamivir, chloroquine and lopinavir along with ritonavir have been found to be effective in symptomatic treatment and recovery of Covid-19 patients. More trials for new drug development and complete eradication of this novel coronavirus (nCoV) vaccines are underway.

INTRODUCTION

In central China, more than 81,000 individuals have been diagnosed with the latest coronavirus (Covid-19), which spreads in 201 countries, territories and major countries in the world are USA (more than 1, 75,000), Italy (more than 1, 02,000), Spain (near 95,000), Germany (near 69,000), Iran (near 45,000) and South Korea (10,000) reported in the month of last week march 2020, which now threaten to move around the world as a pandemic. [1] Corona virus is zoonotic, transmitted between animals and humans. As the disease known as Covid-19 becomes pandemic and Covid-19's incubation period could be as long as 27 days, but currently the coronavirus incubation period is estimated to be 14 days, based on WHO guidelines. [2-3] One thing is certain as billions of people are going to jump for a drug or vaccine. Common cold, such as fever, running nose, headache, cough and sore throat are the symptoms involved. In more severe cases, pneumonia, severe acute respiratory syndrome, kidney failure and even death may result from infection. 31,000 death cases have been reported around the world so far and the number is increasing every day. While there is still no effective cure for the virus and the pneumonia it induces, according to the World Health Organization, there are more than 50 medications or drug combinations that are potentially worth trying.

REVIEW METHODOLOGY

In this study, information on coronavirus and treatment was gathered by searching databases including PubMed, Press, Elsevier, Google Scholar, Springer, *etc.*

DRUGS

Some of them have been performed clinical studies that are most promising, of which few are fast-moving research molecules.

Remdesivir

While experimental, a broad spectrum antiviral drug is injectable remdesivir, manufactured by the gilead sciences. [4] The drug creates a malformed nuclear version that the virus needs to make new copies of it to avoid its replication. To date, this drug has proven potentially successful on MERS-infected rats and monkeys. [5] SARS-CoV-2 and Nipah and Hendra virus infections are being investigated. Gilead offered rehabilitation to doctors who diagnosed an US patient in Snohomish County, Washington with SARS-CoV-2, based on success against other coronavirus infections, improving its condition and thus supplying the compound to China, to perform a couple of trials in infected individuals with and without serious symptoms. [6]

Favilavir

The first drug in China approved for coronavirus. In a clinical trial involving 70 patients the drug has reportedly shown effectiveness in treating the disease with minimal side effects. The clinical studies carried out in Shenzhen. [5] The drug is only licensed as an experimental drug and many studies on its efficacy, as well as toxic reactions and other side effects are still needed. [7]

Atazanavir (Reyataz)

Proteinase similar to Covid-19, 3C, was expected to associate with Atazanavir. Although there is no real world proof that this medication can work against CoV, several case studies in the treatment have been found to be effective. [6]

Darunavir Plus Cobicistat (Rezolsta)

Rezolsta contains 2 active pharmaceutical products. Darunavir (800 mg) is an inhibitor of protease; it acts by blocking the enzyme, the virus does not replicate normally and its development and spread gradually. Cobicistat (150 mg) serves as a booster to improve darunavir's efficacy, by prolonging the time it works in the body. [8] The medication

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RESEARCH ARTICLE

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The Molecular Docking of Selected Antiretroviral Agents and Chloroquine Derivatives as COVID-19 Inhibitor N3 (6LU7) using Molegro Virtual Docker

Sunil Junapudi[1]*, Sindura Gollamudi[2]

Abstract: Coronavirus causes the zoonotic disease Covid-19, which was declared in March 2020. There is currently no effective cure for the virus and virus-induced pneumonia. Nevertheless, the World Health Organization stated antiretroviral agents and chloroquine derivatives were used as medications or in combination with other drugs to treat Covid-19. Physicochemical and toxicity properties (ADMET) parameters determined ARVs and CQ derivatives using Swiss-ADME online software and pkCSM online software. X-ray crystallographic 3D structures of the main COVID-19 protease in complex with an inhibitor N3 (PDB code: 6LU7, resolution 2.16A^0 complexed with a selective substance, crystallized) were downloaded from Protein Data Bank online. ChemDrawUltra8.0 was used to prepare the ligand and protein structures. The docking process, interactions and binding of protein ligands were performed and visualized using MolegroVirtual Docking tools (MVD). In general, the obtained mole docking scores are between -71.85 and –244.25 kcal/mol. The Hydrogen bond and steric interaction compared with Remdesivir, Favipiravir, Atazanavir, Darunavir, Cobicistat, Lopinavir, Ritonavir, Arbidol and Oseltamivir compounds. Hydroxychloroquine is more potent in comparison with Chloroquine. The active COVID-19 inhibitor N3 compounds of remdesivir, atazanavir, ritonavir, cobicistat and hydroxychloroquine fit well and also interact with active site residues that are essential for their biological activity. Therefore remdesivir, atazanavir, ritonavir, cobicistat and hydroxychloroquine compounds could be a COVID-19 inhibitor N3 of 6LU7 and might be used treatment of COVID-19 infections.

INTRODUCTION

Coronavirus disease is an infectious disease caused by a +ss-RNA, the positive single-stranded RNA virus SARS-CoV-2. It transmits through respiratory droplets from person to person through close contact with an affected individual. There are more than 90 million individuals diagnosed with Covid-19 in the world. It has spread to 201 countries, territories and major countries in the world, such as the USA, Brazil, India and Russia which now threaten to move around the world like a pandemic. [1]

Covid-19's incubation period is between 14 - 27 days, based on WHO guidelines. [2] However, 97% of the people, develop symptoms within 11 days. These symptoms include but are not limited to the following: common cold, fever, running nose, headache, cough, difficulty in breathing, loss of sense of smell, diarrhea and sore throat. Pneumonia, extreme acute respiratory syndrome, renal failure, multiple organ failure and even death may result from infection in more severe cases. [3, 4] Eighty-six thousand deaths have been reported around the world so far and the number is increasing every day. However, this viral disease can be asymptomatic in individuals too. There is still no effective cure for the virus and virus-induced pneumonia, According to the WHO (World Health Organization); there are more than 50 medications or drug combinations that are potentially worth trying.

This paper reports various antiretroviral agents (ARVs) and chloroquine (CQ) derivatives initially screened using the Molegro Virtual Docker Software. These compounds are related directly or indirectly to the 6UL7 enzymes isolated from the protein database by the ring system. As a result, we were able to classify the ligands that bind similarly to the 6UL7 reference ligand binding and estimate the binding affinity of the ligands for their target, different ligand molecular structures were docked and scored.

MATERIAL AND METHODS

Physicochemical and Toxicity Properties

Physicochemical and toxicity properties (ADMET) parameters helped determine ARVs and CQ derivatives. Lipophilicity values were calculated using different parameters viz iLog, p Log p3, MR (Molar Refractivity). Pharmacokinetics components, such as GI absorption, BBB permeant, Log Kp, were measured using Swiss-ADME online software. [5] Meanwhile, pkCSM online software determined AMES toxicity and max tolerated dose, LD_{50} (oral rat acute toxicity), hepatotoxicity and oral rat Chronic toxicity properties. [6]

Protein

X-ray crystallographic 3D structures of the SARS-CoV-2 protease in complex with an inhibitor N3 (PDB code: 6LU7, resolution 2.16A^0 complexed with a selective substance, crystallized by Liu *et al*, 2020) [7] were downloaded from the online Protein Data Bank. Molegro Virtual Docker (MVD) 2013.6.0 Tools, helped determine protein binding modes of 6LU7when complexed with a selective inhibitor and the most advantageous and optimal ligands were further studied. [7] The crystal structure of COVID-19 main protease in complex with an inhibitor N3 (6LU7) contains three unique types of molecules. Molecule 1 is a protein called SARS-CoV-2 main protease; Molecule 2 is a protein called N-[(5 methyl isoxazole-3-yl) carbonyl] alanyl-lvalyl-N-1-({1R, 2Z)-4-(benzyloxy)-4-oxo-1-{[(3R)-2-oxopyrrolidin-3-yl] methyl} but-2-enyl)-L-leucinamide; Molecule 3 is water. The exploitation bind module via the plant's mole dock scores was used to calculate the volumes of the binding pockets.

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1. Introduction

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A new trigonometrical method for solving non-linear transcendental equations

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Abstract

This paper presents a new algorithm to find a non-zero positive real root of the transcendental equations. The proposed method is based on the combination of the inverse tan(x) function and the Newton-Raphson method. Implementation of the proposed method in MATLAB is applied to different problems to ensure the method's applicability. The proposed method is tested on number of numerical examples and results indicate that our methods are better and more effective as compared to well-known methods. Error calculation has been done for available existing methods and the new proposed method. The errors have been reduced rapidly and obtained the real root in less number of iterations as compared to renowned methods. Certain numerical examples are presented in this paper to show the effectiveness of the proposed method. The Convergence of the proposed method is discussed and shown that the method reduces to Newton-Raphson method that is quadratic convergent. This approach will also help to produce a non-zero real root of a given non-linear equations (transcendental, algebraic, and exponential) in the commercial package.

Keywords: Nonlinear equation, iteration method, transcendental equations.

2020 MSC: 65H04, 65H05.

1. Introduction

Root finding methods have enormous applications in many fields such as Finding Methods Applied to Digital Maximum Power Point tracking of sustainable photovoltaic energy generation, computation of gradient retention times in liquid chromatography, for solving non-linear differential equations, in circuit analysis, analysis of state equations for a real gas, mechanical motions/oscillations, weather forecasting, in optimization and many other fields of engineering designing processes. Root finding methods can also be applied in the discrete stochastic arithmetic (DSA) to validate the class of multi-step iterative methods and find the optimal numerical solution of non-linear equations.

In [5], Gemechu used derivative estimations up to the third-order (in root finding, some new initiatives) are applied in Taylor's approximation of a non-linear function/equation to achieve efficient iterative

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AN ITERATIVE METHOD FOR SOLVING NON-LINEAR TRANSCENDENTAL EQUATIONS

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Abstract: In this paper, we introduced a new method to compute a non-zero real root of the transcendental equations. The proposed method results in better approximate root than the existing methods such as bisection method, regula-falsi method and secant method. The implementation of the proposed method in MATLAB is applied on different problems to demonstrate the applicability of the method. The proposed method is better in reducing error rapidly, hence converges faster as compared to the existing methods. This method will help to employ in the commercial package for finding a non-zero real root of a given nonlinear equations (transcendental, algebraic and exponential).

Keywords: transcendental equations; secant method; non-linear equation; iteration method.

2010 AMS Subject Classification: 65H04, 65H05.

1. INTRODUCTION

Most of the engineering and scientific problems are expressed as nonlinear transcendental equations for which the evaluations of roots are more complicated. Such nonlinear equations

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IMPACT OF COVID-19 ON THE MEDICAL DEVICE INDUSTRY

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Abstract: **The main aim of this study is to review the effect caused by Covid 19 on the medical device industry and to study the challenges faced by the medical device industry in different countries such as India, the USA, European countries. In earlier May 2020, over 4.7 million people have been confirmed to be infected with the SARS-CoV-2 coronavirus, and governments are worried to get contain its spread. The high RO value (a measure of contagiousness-estimated to be between 2.0 and 3.02) of SARS-CoV-2 means that those infected copiously spread the virus and develop complications suddenly. As a result, health care systems are widespread, and the effective delivery of medical care to all patients has become challenging to the whole world. Improper seeking to early warning signals, less amount of stockpiling, lack of ease to testing kits and personal protective equipment (PPE), and country-wise variability in the approaches to testing kits, distribution of PPE, and timing and degree of social distancing measures are likely to get affect the spread of disease. As the COVID-19 pandemic continues to get imbalanced, medical device companies are finding it difficult to make précised decisions about their products, supply chains, and regulatory obligations in the advent of uncertainty. With a technique that leverages exemptions, production procedures that innovate to fill needs, and a communication plan that works across public and personal entities, which may navigate the chaos and support public health. Obligations from governing bodies and conversations with key decision-makers and regulatory authorities hold the key to the success of the medical device industry. At last, the implementation of several new regulations may be postponing as making many companies and regulatory agencies time to react to the crisis. However, there is no evidence to make this scenario be the deadline for suggestions.**

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5. Control of conception,
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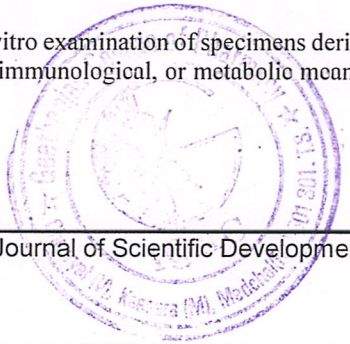
7. Providing information utilizing in vitro examination of specimens derived from the human body; and does not achieve its primary intended action by pharmacological, immunological, or metabolic means, in or on the physical body, but which can be assisted in its intended function by such means.



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PREPARATION AND NUTRITIVE EVALUATION OF AZOLLA PINNATA PELLETS/GRANULES AS POULTRY FEED

1R Naga Kishore, 2N Anjaneyulu, 3M Ravi Kumar
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Abstract

In the recent past, few studies have been carried out in chicken to assess the effect of *Azolla* meal and raw *Azolla* feeding on the performance of chicken. If we use unconventional feedstuffs like *Azolla* without reducing the performance, it will increase the profitability of broiler business. Hence, a study was carried out to evaluate the effect of dried *Azolla pinnata* vis-a-vis raw *Azolla* as choice feeding on the growth. Use of Azolla in broiler diets can improve the economic performance of broilers. Azolla is a free floating fern which can be regarded as a valuable food source. Azolla can be used as a plant protein source and provitamins for poultry nutrition. This plant with its thin roots is like a carpet that has been spread on the water surface. This plant's leaves are delicate, little and sensitive and have different colors depending on what point of time they have grown. Two formulations were prepared to enhance the shelf life of azolla and observed for their growth. Both formulations showed best results over 15 days of period. Further studies are necessary to improve the shelf life of azolla.

Keywords: *Azolla pinnata* , provitamins, poultry nutrition and formulations.

Introduction

Azolla is an aquatic fern, which resembles duckweed or mosses. It is addressed with other names like mosquito fern, duckweed fern, fairy moss or water fern. The name Azolla is derived from two Greek words, i.e. 'azo' means dry and 'ollya' means to kill. Therefore, this name Azolla indicates an important property of the fern that it would be killed by drought. Azolla is native to Asia, Africa, and America. Azolla is believed to float on the surface of the water with roots hanging underneath. These plants have leaves which are small in size and overlap on each other. The leaves or fronds are water repellent and sometimes red in color. This plant is popular as 'super-plant' because of its great speed of growing and doubling its biomass within 2 or 3 days. Currently, the plant genus has 6 species of which A.pinnata is mostly found in Asia.[1] The length of the roots for Azolla is around 1 to 2 cm and the leaf size is about 1 to 2 cm. The fern has a sporophytic cycle and is generally associated with cooler temperatures. The difference in the strain and environmental factors can alter the nutrient composition of Azolla. Azolla is considered to have the following nutrients, which is why it is greatly used as animal or livestock feed (For dairy animals, poultry, sheep and goat). Dried Azolla has: Crude

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ANALYTICAL METHOD DEVELOPMENT AND VALIDATION FOR THE DETERMINATION OF EMTRICITABINE AND TENOFOVIR DISOPROXIL FUMARATE USING REVERSE PHASE HPLC METHOD IN BULK AND TABLET DOSAGE FORM

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ABSTRACT

Objective: A New method was established for simultaneous estimation of Emtricitabine and Tenofovir disoproxil fumarate by RP-HPLC method. **Methods**: The chromatographic conditions had been effectively advanced for the separation of Emtricitabine and tenofovir by way of using Edurasil ODS-3 C18(4.6 x 50mm, 3.5µm) column, go with the flow charge changed into 1ml/min, cellular segment ratio become Phosphate buffer (0.05M) pH four.6: ACN (30: 70) (pH become adjusted with orthophosphoric acid), detection wave period was 250nm. The device used turned into WATERS HPLC Auto Sampler, Separation module 2695, PDA Detector 996, Empower-software model-2. **Results**: Retention time of Emtricitabine and tenofovir were found to be 0.919 min and 1.732 min. The % purity of Emtricitabine and tenofovir was found to be 99.7 % and 99.04 % respectively. The system suitability parameters for Emtricitabine and tenofovir such as theoretical plates and tailing factor were found to be 1.56, 2744.20 and 1.19, 33.75.11. The linearity study for Emtricitabine and tenofovir was found in concentration range of 20µg-100µg and 30µg-150µg and correlation coefficient (r2) was found to be 0.999 and 0.999 % % RSD for intermediate precision was 0.6 and 0.69 respectively. The precision study was precise, robust and repeatable. LOD value was 2.98 and 2.96, and LOQ value was 9.98 and 9.96 respectively. **Conclusion**: The results of study showed that the proposed RP-HPLC method is a simple, accurate, precise, rugged, robust, fast and reproducible, which may be useful for the routine estimation of Emtricitabine and Tenofovir disoproxil fumarate in pharmaceutical dosage form.

KEYWORDS: Emtricitabine, Tenofovir disoproxil fumarate. RP-HPLC.

INTRODUCTION

Emtricitabine is a nucleoside reverse transcriptase inhibitor (NRTI) indicated for the treatment of HIV infection in adults or combined with tenofovir alafenamide for the prevention of HIV-1 infection in high-risk adolescents and adults.[1] Emtricitabine is a cytidine analogue.[2] The drug works by inhibiting HIV reverse transcriptase, preventing transcription of HIV RNA to DNA. IUPAC Name: 4-amino-5-fluoro-1-[(2R,5S)-2-(hydroxymethyl)-1,3-oxathiolan-5-yl]-1,2-dihydropyrimidin-2-one. Chemical Formula is $C_8H_{10}FN_3O_3S$. Molecular Weight is 247.247 $g \cdot mol^{-1}$. Emtricitabine is a white to off-white powder with a solubility of approximately 112 mg/mL in water at 25 °C. The log P for emtricitabine is -0.43 and the pKa is 2.65.

Tenofovir disoproxil fumarate (a prodrug of tenofovir), marketed by Gilead Sciences under the trade name *Viread*, belongs to a class of antiretroviral drugs known as nucleotide analogue reverse transcriptase inhibitors (nRTIs).[3] This drug is prescribed in combination with other drugs for the management of HIV infection as well as for Hepatitis B therapy. Tenofovir belongs to a class of antiretroviral drugs known as nucleotide analog reverse transcriptase inhibitors (NtRTIs), which block reverse transcriptase, an enzyme necessary for viral production in HIV-infected individuals.[4] This enables the management of HIV viral load through decreased viral replication. IUPAC Name (2E)-but-2-enedioic acid; bis({[(propan-2-yloxy) carbonyl]oxy}methyl){[(2R)-1-(6-amino-9H-purin-9-yl)propan-2yl]oxy} methanephosphonate. Chemical Formula is $C_{23}H_{34}N_5O_{14}P$. Molecular Weight is 635.51 $g \cdot mol^{-1}$.

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A REVIEW OF 1,2,4-TRIAZOLES: SYNTHESIS AND PHARMACOLOGICAL USES

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ABSTRACT

Heterocycle compounds are cyclic or noncyclic structure which contain one or more heteroatom. The heterocycle compounds containing nitrogen are widely used in medicinal chemistry. More than 75% drugs which are available in market contain nitrogen in heterocyclic moieties. Among these 1,2,4-triazole nucleus has attracted many researchers because of its simple, easy, cost effective method of synthesis and also mainly because of multidirectional biological activity (such as antibacterial, anticancer, analgesic, anticonvulsant ,antioxidant, antiviral).The current review mainly aims on the synthesis methods and pharmacological uses of 1,2,4-triazole derivatives.

KEYWORDS: 1.2.4-triazoles, Synthesis, Pharmacological uses.

Introduction:

Triazole is an aromatic heterocyclic compound which is a five membered ring comprised of 2 carbon and 3 nitrogen atoms with molecular formula $C_2H_3N_3$.. The triazoles are said to be the isosters of imidazoles in which the carbon atom of imidazole is isosterically replaced by nitrogen [1]. According to the position of nitrogen atoms, triazoles exist in two isomeric forms - 1,2,3-triazole (υ-triazoles) and 1,2,4-triazole ((s-triazoles). The mobile protons at the ring nitrogen atoms of 1,2,3- and 1,2,4-triazoles are responsible for the tautomerism [2]. The 1,2,4-triazole ring may exist in equilibrium between two forms: 1*H*-form and 4*H*-form an difficult to separate due to rapid interconversions.[3].

IMPACT OF COVID-19 ON THE MEDICAL DEVICE INDUSTRY

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[1]Assistant Professor, [2]Assistant Professor, [3] Assistant Professor, [4]Head of the Department, [5]Principal
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RESEARCH ARTICLE

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A Prospective Comparative Study on the Efficacy of Chlorzoxazone, Ibuprofen and Paracetamol versus Thiocolchicoside, Aceclofenac and Paracetamol in Patients with Acute Lower Backache: A Tertiary Care Hospital

Athyala Divya[1], Balaraju Ramya[1], Muddapuram Manasa[1], Varsha Madas[1], Karthik[2], R Naga Kishore[1]*

Abstract: The combination of CNS acting muscle relaxants, non-steroidal medicine medication and paracetamol are normally prescribed in the management of mechanical low backache. To compare the effectiveness of combination drugs chlorzoxazone, ibuprofen and paracetamol versus thiocolchicoside, aceclofenac and paracetamol in subjects having low backache. A total of one hundred patients between ages vary from eighteen and sixty years having acute lower backache of ≤7 days length were categorized as groups. Group A type was prescribed with thiocolchicoside, paracetamol and aceclofenac whereas Group B type was prescribed with chlorzoxazone, aceclofenac and paracetamol orally doubly daily for seven days. The pain assessment, calculated by VAS and ODI. Readings were recorded on day one (baseline) and day seven. A significant pain reduction occurred on day seven in two groups. It was observed statistically that relief in pain varied in 2 groups, however clinically Group-B subjects shown better efficacy compared to Group-A. These findings confirm that chlorzoxazone, paracetamol, ibuprofen is a preferable combination for patients having low backache.

INTRODUCTION

Low back pain (LBP) is a considerable health problem in all developed countries and is most commonly treated in primary healthcare settings. It is usually defined as pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without leg pain (sciatica). The most important symptoms of non-specific low back pain are pain and disability. The diagnostic and therapeutic management of patients with low back pain has long been characterized by considerable variation within and between countries among general practitioners, medical specialists and other healthcare professionals. [1, 2] It is a major health and socio-economic problem [3] and is associated with high costs of health care, work absenteeism and disablement. [4] In general, LBP is managed with the short-term use of non-steroidal anti-inflammatory drugs (NSAIDs) and centrally acting skeletal muscle relaxants. [5] Unfortunately, NSAIDs have gastric intolerance, whereas most of the centrally acting muscle relaxants have central nervous system depressant Side-effects such as sedation, dizziness, impairment of coordination, mental confusion, weakness, etc. [6] Hence, these limiting factors demand a need for an ideal fixed-dose combination (FDC) which is devoid of effects on psychomotor performance, free of sedation and higher tolerability.

The visual analog scale (VAS) is a valid and reliable measure of chronic pain intensity. However, little work has been done to assess the reliability of the VAS for the measurement of acute pain. The few studies that have explicitly assessed the reproducibility of VAS measures of pain focused on chronic or postoperative pain and most examined the correlation between repeat VAS measures. [7] A study of a mechanical version of a VAS (a tool with a 10-cm ruler and a marker that the patient moves to the point indicating his or her intensity of pain) used by patients with pain found a correlation of 0.88 between two measures taken two hours apart. Studies that examined the correlation between a vertically oriented VAS for pain with a horizontally oriented VAS found correlations of 0.99 and 0.91 when they were given within 10 minutes of each other to patients with a variety of pain. [7, 8]

The Oswestry Disability Index (ODI) is the most commonly used outcome-measure questionnaire for low back pain in a hospital setting. It is a self-administered questionnaire divided into ten sections designed to assess the limitations of various activities of daily living. Each section is scored on a 0–5 scale, with 5 representing the greatest disability. The index is calculated by dividing the summed score by the total possible score, which is then multiplied by 100 and expressed as a percentage. Thus, for every question not answered, the denominator is reduced by 5. If a patient marks more than one statement in a question, the highest-scoring statement is recorded as a true indication of disability. The questionnaire takes 3.5–5 min to complete and approximately 1 min to score. [9, 10]

Chlorzoxazone, a central muscle relaxant acts primarily at the level of the spinal cord and subcortical areas of the brain, where it inhibits multisynaptic reflex arcs involved in producing and maintaining skeletal muscle spasms. The exact mode of action is not clear, may be related to the sedative properties of the drug. The side-effect profile is similar to that of most other muscle relaxants, except for a limited number of reported cases of significant hepatotoxicity particularly by chlorzoxazone. [11]

Thiocolchicoside is a semi-synthetic derivative of colchicines, a natural glycoside that originated from flower seeds of superb gloriosa. [12] It has an affinity for the inhibitory glycine and gamma-aminobutyric acid (GABA)-A

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Keywords: *Azolla pinnata* , provitamins, poultry nutrition and formulations.

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Azolla is an aquatic fern, which resembles duckweed or mosses. It is addressed with other names like mosquito fern, duckweed fern, fairy moss or water fern. The name Azolla is derived from two Greek words, i.e. 'azo' means dry and 'ollya' means to kill. Therefore, this name Azolla indicates an important property of the fern that it would be killed by drought. Azolla is native to Asia, Africa, and America. Azolla is believed to float on the surface of the water with roots hanging underneath. These plants have leaves which are small in size and overlap on each other. The leaves or fronds are water repellent and sometimes red in color. This plant is popular as 'super-plant' because of its great speed of growing and doubling its biomass within 2 or 3 days. Currently, the plant genus has 6 species of which A.pinnata is mostly found in Asia.[1] The length of the roots for Azolla is around 1 to 2 cm and the leaf size is about 1 to 2 cm. The fern has a sporophytic cycle and is generally associated with cooler temperatures. The difference in the strain and environmental factors can alter the nutrient composition of Azolla. Azolla is considered to have the following nutrients, which is why it is greatly used as animal or livestock feed (For dairy animals, poultry, sheep and goat). Dried Azolla has: Crude

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Major cardiac concerns in therapy and vaccinations for COVID-19

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ABSTRACT

The necessity and impact of SARS-CoV-2 on the world's health have led to the development and production of practical and useful vaccines for this deadly respiratory virus. Since April 2020, a vaccine for the virus has been developed. Given that comorbidities such as diabetes, hypertension, and cardiovascular disease are more prone to viruses and the risk of infection, vaccines should be designed to protect against high-risk respiratory illnesses. In this review, we discussed the cardiovascular alteration in SARS-CoV-2 treatment, and we also reviewed the vaccination information and studies that have been done to primary considerations for cardiac patients.

1. Introduction

Coronavirus disease 2019 (COVID-19) was first reported in Wuhan, China, in late December 2019. Since then, COVID-19 has spread rapidly worldwide and has become a global pandemic, with a remarkable effect on public health and social and economic activities [1]. COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [2], which is a member of the genus *Betacoronavirus* like the two other coronaviruses that have caused pandemic diseases (severe acute respiratory syndrome coronavirus (SARS-CoV) [3] and Middle East respiratory syndrome coronavirus (MERS- CoV)) [4]. SARS-CoV and MERS-CoV, SARS-CoV-2 cause respiratory infection, leading to viral pneumonia and acute respiratory distress syndrome (ARDS) in some patients [5].

However, in addition to respiratory symptoms, uncontrolled SARS-CoV-2 infection can trigger a cytokine storm. Pro-inflammatory cytokines and chemokines such as tumor necrosis factor- α, IL-1β and IL-6 are overproduced by the immune system, resulting in multiorgan damage [6]. Furthermore, COVID 19 causes coagulation abnormalities in a substantial proportion of patients [7], leading to thromboembolic events [8]. The genomic sequence [9]and viral protein structure [10] of SARS-CoV-2 have been studied intensively since its emergence. Understanding the biological features of the virus will contribute to the development of diagnostic tests, vaccines, and pharmacological therapies and can further our knowledge of tissue tropism [11]. Early clinical data indicate that both the susceptibility to and the outcomes of COVID-19 are strongly associated with cardiovascular disease (CVD) [12]. A high prevalence of pre-existing CVD has been observed among patients with COVID-19, and these comorbidities are associated with increased mortality [13]. Furthermore, COVID-19 seems to promote the development of cardiovascular disorders, such as myocardial injury [14], arrhythmias, acute coronary syndrome (ACS), and venous thromboembolism [15].

Children with COVID-19 have also been reported to develop hyperinflammatory shock with features akin to Kawasaki disease, including cardiac dysfunction and coronary vessel abnormalities [16]. Together, this data indicate bidirectional interaction between COVID-19 and the cardiovascular system, but the mechanisms underlying this interaction remain elusive. The high burden of systemic inflammation associated with COVID-19 has been proposed to accelerate the development of subclinical disorders or cause de novo cardiovascular damage [17]: ACE2, an essential surface protein for virus entry and part of the renin-angiotensin–aldosterone system (RAAS), is also thought to be involved in this interaction based on findings from animals [18].

The first mass vaccination program started in early December 2020, and as of 15 February 2021, 175.3 million vaccine doses have been administered. At least 7 different vaccines (3 platforms) have been administered. WHO issued an Emergency Use Listing (EULs) for the

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Review Article

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Epigenetic concerns in therapy for Chronic Obstructive Pulmonary Disease

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Keywords: COPD; DNA Methylation; Epigenetic; Histone

ABSTRACT

Many multifaceted diseases, the complexity of which we are just beginning to understand and supposed to include epigenetic pathways. Chronic obstructive pulmonary disorder (COPD) and asthma are two respiratory diseases risk with influential environmental factors depending on the underlying inherited vulnerability. Via the modulation of ecological effects to regulate disease development, epigenetic mechanisms such as histone modification, methylation of DNA, and miRNA can be concerned in these processes. Because of their proven modifiability, epigenetic mechanisms open up new opportunities for clinical interference. In this review, we summarised an overview of respiratory epigenetics for COPD, which is the relevance of our existing awareness of mechanisms that lead to these diseases. We also emphasized the epigenetic studies of heritable phenotype changes and the involvement in DNA sequence alterations.

Abbreviations: COPD: Chronic Obstructive Pulmonary Disease; DNMT: DNA Methyltransferase; CPG: Cytosine Phosphate Guanine; CS: Cigarette Smoking

Introduction

COPD (Chronic Obstructive Pulmonary Disease) is a prevalent chronic adult disease that, by 2020, will be the world's 3rd leading cause of death. COPD is characterized by Mucociliary dysfunction, lung inflammation, airway fibrosis, and alveolar destruction [1]. There are many factors at hand, such as chronic inflammation, the theory of elastase/anti-elastase, apoptosis, the balance of oxidant-antioxidant, and infective repair that cause COPD pathogenesis [2,3]. Cigarette smoke contains over 4700 organic compounds and 1014 free radicals/oxidants, making it the primary source of COPD and inflammation [4]. It stimulates multiple redox sensitive transcription factors such as NF-kB (nuclear factor kappa B), most important to increased pro-inflammatory cytokine and chemokine assembly in COPD [5,6]. Post-translational changes in histone and other DNA proteins are known as epigenetic alterations [7]. Without altering the primary gene sequence, DNA methylation and histone methylation can influence gene expression such as post translational histone protein modifications are acetylation, phosphorylation, and ubiquitination (H2A, H2B, H3, and H4) [8].

Chapter 1
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Optimization of Diabetes by Herbal Medicine

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ABSTRACT

Plant-based medicinal products have been acknowledged since ancient times. Several medicinal plants and their products have been used to control diabetes in the traditional therapeutic systems of many cultures worldwide. The plants provide a potential source of hypoglycemic drugs because many plants and plant-derived compounds have been used to treat diabetes. Several synthetic oral hypoglycemic agents are the primary forms of treatment for diabetes. However, prominent side-effects of such drugs are the main reason for an increasing number of people seeking alternative therapies that may have less severe or no side effects. Still, little toxicological information exists concerning traditional antidiabetic plants. The present paper attempts to list the plants with antidiabetic and related beneficial effects originating from different parts of the world and Polyherbal formulations. History has shown that medicinal plants have been used in traditional healing worldwide for a long time to treat diabetes. Such herbal plants have hypoglycemic properties and other beneficial properties, as reported in scientific literature. This book chapter portray, the importance of herbal plants and polyherbal formulations in the treatment of diabetes mellitus. The effects of these plants may delay the development of diabetes and its complications due to their chemical constituents.

Keywords: Optimization; diabetes; herbal medicine.

1. INTRODUCTION

Diabetes mellitus is a heterogeneous metabolic disorder characterized by altered carbohydrate, lipid, and protein metabolism caused by insulin deficiency, often combined with insulin resistance. It is considered one of the five leading causes of death in the world. About 150 million people are suffering from diabetes worldwide and It is almost five times more than the estimated ten years ago, which may be doubled by 2030 [1]. Further, the International Diabetes Federation predicts that by 2045 the number of individuals effected with diabetes will increase to 629 million [2]. It is projected that the total global economic burden will escalate from the U.S. $ 1.3 trillion in 2015 to $ 2.5 trillion in 2030, which represents a staggering increase in costs as a share of global GDP from 1.8% in 2015 to 2.2% in 2030 [3]. Despite considerable progress in the treatment of diabetes by oral hypoglycemic agents, the search for newer drugs continues because the existing synthetic drugs have several limitations. The herbal medicines with antidiabetic activity are yet to be commercially formulated as modern medicines, even though they have been acclaimed for their therapeutic properties in the traditional systems of medicine. The plants provide a potential source of hypoglycemic drugs because many plants and plant-derived compounds have been used to treat diabetes. Many Indian plants have been investigated for their beneficial use in different types of diabetes, and reports are evident in numerous scientific journals. Ayurveda and other traditional medicinal systems for the treatment of diabetes describes numerous plants used as herbal drugs. Hence, they play an indispensable role as an alternative medicine due to fewer side effects and low cost. The active principles present in medicinal plants have been reported to possess the pancreatic beta cells re-generating, insulin-releasing, and

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A REVIEW OF 1,2,4-TRIAZOLES: SYNTHESIS AND PHARMACOLOGICAL USES

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ABSTRACT

Heterocycle compounds are cyclic or noncyclic structure which contain one or more heteroatom. The heterocycle compounds containing nitrogen are widely used in medicinal chemistry. More than 75% drugs which are available in market contain nitrogen in heterocyclic moieties. Among these 1,2,4-triazole nucleus has attracted many researchers because of its simple, easy, cost effective method of synthesis and also mainly because of multidirectional biological activity (such as antibacterial, anticancer, analgesic, anticonvulsant ,antioxidant, antiviral).The current review mainly aims on the synthesis methods and pharmacological uses of 1,2,4-triazole derivatives.

KEYWORDS: 1.2.4-triazoles, Synthesis, Pharmacological uses.

Introduction:

Triazole is an aromatic heterocyclic compound which is a five membered ring comprised of 2 carbon and 3 nitrogen atoms with molecular formula $C_2H_3N_3$.. The triazoles are said to be the isosters of imidazoles in which the carbon atom of imidazole is isosterically replaced by nitrogen [1]. According to the position of nitrogen atoms, triazoles exist in two isomeric forms - 1,2,3-triazole (υ-triazoles) and 1,2,4-triazole ((s-triazoles). The mobile protons at the ring nitrogen atoms of 1,2,3- and 1,2,4-triazoles are responsible for the tautomerism [2]. The 1,2,4 triazole ring may exist in equilibrium between two forms 1*H*-form and 4*H*-form an difficult to separate due to rapid interconversions.[3].

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IMPACT OF COVID-19 ON THE MEDICAL DEVICE INDUSTRY

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Abstract: **The main aim of this study is to review the effect caused by Covid 19 on the medical device industry and to study the challenges faced by the medical device industry in different countries such as India, the USA, European countries. In earlier May 2020, over 4.7 million people have been confirmed to be infected with the SARS-CoV-2 coronavirus, and governments are worried to get contain its spread. The high RO value (a measure of contagiousness-estimated to be between 2.0 and 3.02) of SARS-CoV-2 means that those infected copiously spread the virus and develop complications suddenly. As a result, health care systems are widespread, and the effective delivery of medical care to all patients has become challenging to the whole world. Improper seeking to early warning signals, less amount of stockpiling, lack of ease to testing kits and personal protective equipment (PPE), and country-wise variability in the approaches to testing kits, distribution of PPE, and timing and degree of social distancing measures are likely to get affect the spread of disease. As the COVID-19 pandemic continues to get imbalanced, medical device companies are finding it difficult to make précised decisions about their products, supply chains, and regulatory obligations in the advent of uncertainty. With a technique that leverages exemptions, production procedures that innovate to fill needs, and a communication plan that works across public and personal entities, which may navigate the chaos and support public health. Obligations from governing bodies and conversations with key decision-makers and regulatory authorities hold the key to the success of the medical device industry. At last, the implementation of several new regulations may be postponing as making many companies and regulatory agencies time to react to the crisis. However, there is no evidence to make this scenario be the deadline for suggestions.**

Keywords: **Medical device, Regulatory bodies, Surgical handling instruments.**

I. Introduction:

A medical device is any device intended to be used for medical purposes. Medical devices benefit patients by helping health care providers diagnose and treat patients and helping patients overcome sickness or disease, improving their quality of life. Significant potential for hazards is inherent when employing a device for medical purposes and thus medical devices must be proved safe and effective with reasonable assurance before regulating governments allow marketing of the device in their country.

As a general rule, as the associated risk of the device increases the amount of testing required to establish safety and efficacy also increases. Further, as associated risk increases the potential benefit to the patient must also increase. Medical devices vary in both their intended use and indications to be used. Examples range from simple, low-risk devices such as tongue depressors, medical thermometers, disposable gloves, and bedpans to complex, high-risk devices that are implanted and sustain life.

One example of high-risk devices is those with embedded software like pacemakers, and which assist in the conduct of medical testing, implants, and prostheses. The design of medical devices constitutes a serious segment of the sector of biomedical engineering.

II. Medical devices according to WHO

Medical Device – Full Definition

'Medical device' means any instrument, apparatus, implement, machine, appliance, implant, reagent for in vitro use, software, material, or another similar or related article, intended by the manufacturer to be used, alone or together, for the citizenry, for one or more of the precise medical purposes(s) of:

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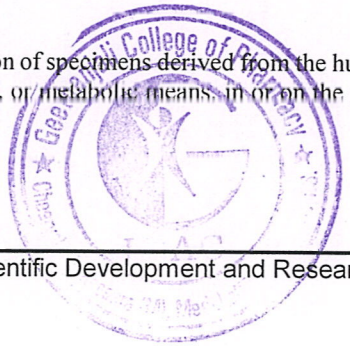

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