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List of the Book/Chapters/ Proceedings Conference Published

S. No	Name of the Teacher	Title of the Book/Chapters Published	Title of the Paper	Title of the Proceedings of the Conference	Name of the Conference	Year of Publication
1	Naveen Kumar Kilaru	Photobiology Reactors for the Degradation of Harmful Compounds in Wastewaters	-	-	-	2021-2022
2	Kanaka Durga Nelluri	Photobiology Reactors for the Degradation of Harmful Compounds in Wastewaters	-	-	-	2021-2022
3	Haritha K	Photobiology Reactors for the Degradation of Harmful Compounds in Wastewaters	-	-	-	2021-2022
4	Buchi N. Nalluri	Micro Needle Aided Transdermal Delivery of Antimigraine Drugs/Chapter 8	-	-	-	2020-2021
5	Kanaka Durga Nelluri	E-Cigarettes : Recent Outbreak and Impact on Respiratory Health	-	-	-	2020-2021
6	Tangirala. Sarala Devi	Synthesis, Molecular Docking Studies and Biological Evaluation of N-Acylarylhydrazones As Anti-Inflammatory Agents	-	-	-	2019-2020

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7	Buchi N. Nalluri	-	A Validated Reverse Phase-HPLC-PDA Method for Estimation of Zolmitriptan in Bulk and Dosage Forms	Exploring and Advances Healthcare Through Novel, Strategies in Pharmacy Practice	International Conference on Exploring and Advances Healthcare Through Novel, Strategies in Pharmacy Practice 2019	2019-2020
8	Buchi N. Nalluri	-	Development of Validated RP-HPLC-PDA Method for the Analysis of Almotriptan in Bulk and Different Dosage Forms and in Dissolution Samples	Exploring and Advances Healthcare Through Novel, Strategies in Pharmacy Practice	International Conference on Exploring and Advances Healthcare Through Novel, Strategies in Pharmacy Practice 2019	2019-2020
9	Buchi N. Nalluri	-	Development of Validated RP-HPLC-PDA Method for the Analysis of Rizatriptan in Bulk and Different Dosage Forms and in Dissolution Samples	Exploring and Advances Healthcare Through Novel, Strategies in Pharmacy Practice	International Conference on Exploring and Advances Healthcare Through Novel, Strategies in Pharmacy Practice 2019	2019-2020

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10	G.Vijaya Kumar		A Qualitative Study Exploring Patient Prescription on The Role of Pharmacist Based Patient Counseling in A Tertiary Care Hospital	Exploring and Advances Healthcare Through Novel, Strategies in Pharmacy Practice	International Conference on Exploring and Advances Healthcare Through Novel, Strategies in Pharmacy Practice 2019	2019-2020
11	Naveen Kumar Kilaru	Flood Borne Dysentery	-	-	-	2018-2019
12	Haritha K	Flood Borne Dysentery	-	-	-	2018-2019
13	Kanaka Durga Nelluri	Flood Borne Dysentery	-	-	-	2018-2019
14	Devala Rao Garikipati	Pharmaceutical Inorganic Chemistry	-	-	-	2018-2019
15	Kanaka Durga Nelluri	Challenges in Emerging Food Borne Disease	-	-	-	2017-2018
16	Devala Rao Garikipati	A Text book of Pharmaceutical Analysis	-	-	-	2017-2018

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Biotechnology for Zero Waste: Emerging Waste Management Techniques

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Chapter 15

15 Photobiological Reactors for the Degradation of Harmful Compounds in Wastewaters 221

Naveen B. Kilaru, Nelluri K. Durga Devi, and Kondepati Haritha

Chapter 15

Photobiological Reactors for the Degradation of Harmful Compounds in Wastewaters

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Book Editor(s):Chaudhery Mustansar Hussain, Ravi Kumar Kadeppagari

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Chapter 8
Print ISBN: 978-93-90149-90-2, eBook ISBN: 978-93-90149-91-9

Microneedle Aided Transdermal Delivery of Antimigraine Drugs

Buchi N. Nalluri[1*] and Chandra Teja Uppuluri[2]

DOI: 10.9734/bpi/tipr/v1/2388E

ABSTRACT

Microneedle (MN) assisted transdermal delivery is a novel technology that can overcome the stratum corneum barrier of skin and enable successful permeation enhancement of drugs. Zolmitriptan (ZT) and Rizatriptan (RT) are antimigraine drugs that show poor and variable bioavailability when administered as currently available formulations, owing to hepatic first pass metabolism. Transdermal delivery with MN application as permeation enhancement strategy was tried to efficiently delivering these molecules. For this purpose, *poke and patch* approach was employed. A significant enhancement in transdermal permeation of both the drugs was found with MN application. It was also found that design parameters like the MN length, needle density, etc., play a major role in such enhancement. Overall, MN application, especially via the poke and patch technique seems like a very promising technology that may hold the key to open up transdermal delivery as the major route for drug delivery in the future.

Keywords: Microneedles; transdermal permeation; triptans.

1. INTRODUCTION

Migraine is the third most common disease in the world affecting about 15% of the global population. The pathophysiology of migraine is still not clearly understood, but is thought to be caused due to dilation of cranial blood vessels. The Global Burden of Disease (GBD) studies ranked migraine as the seventh (in men) and third (in women) leading cause for years lived with disability. Majority of the patients report their pain as severe to very severe that lasts longer than 24 h. The associated symptoms include pulsating and throbbing headache, with sensitivity to light, sound etc. Apart from the pain, the most unpleasant and very common symptoms were described to be nausea and vomiting. The disability experienced during a severe migraine attack was reported to be similar to that observed with conditions like dementia, quadriplegia, active psychosis, etc., by WHO [1–5].

Triptans, 5HT or Serotonin receptor agonists, are the first-line therapy for the management of migraine. Sumatriptan (ST) is the first and most commonly prescribed molecule, as it is the most extensively studied and most familiar among the class. ST is available as oral tablets, nasal spray and subcutaneous injection formulations. It has a short half-life of only 2 h with low bioavailability (BA) (<15%) when administered as oral tablet and nasal spray. Subcutaneous injection offers good BA, but has poor patient compliance. Hence, to improve upon these aspects, several triptans with almost similar acceptability and efficacy (when compared at the respective recommended dose levels), but with marked differences in physicochemical and pharmacokinetic properties were developed over the years. Zolmitriptan (ZT) and Rizatriptan (RT) are among the most commonly prescribed triptans after ST [5–8].

ZT is available in three types of formulations – oral tablet, oral dispersible tablet and nasal spray. All three formulations provide an absolute BA between 40-48% and the maximum daily dose via both the

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In: E-Cigarettes
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Chapter 2

E-CIGARETTES: RECENT OUTBREAK AND IMPACT ON RESPIRATORY HEALTH

Kanaka Durga Devi Nelluri*, Sireesha Uppalapati, Ramya Bandarupalli, Suranjan Bantupalli and Sahithi Kamepalli

KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India

ABSTRACT

E-cigarettes are battery-operated devices, vape pens, e-hookah, e- cigars, e-pipes, or other electronic nicotine delivery systems (ENDS). They are designed that are engineered to heat a liquid solution that emulate smoking with a smoke-free technique. Over the last decade there has been a significant boost towards the use of electronic cigarettes (e- cigarettes), especially among youth. During vaping, a mixture of air and vapours is inhaled to the lungs. Since the ingredients of the e-cigarettes are not burned but vaporised (heated), fewer chemicals are emitted. The levels of potentially toxic compounds (e.g., volatile organic compounds (VOCs), particulate matter (PM), metals, radicals, nitrosamines) emitted from vaping appear to be lower compared to that of tobacco smoking

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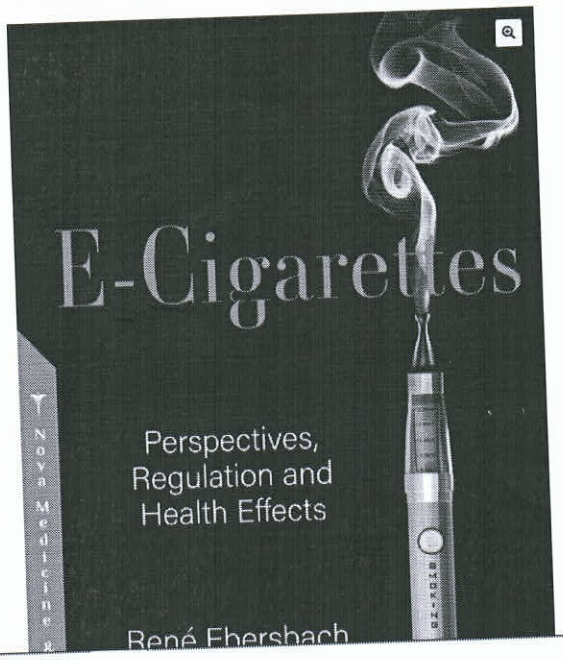

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Ongoing studies of nicotine salts and by-products such as N-nitrosonornicotine and nicotyrine and their physiological effects are also reviewed.

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Synthesis, Molecular Docking Studies and Biological Evaluation of N-Acylarylhydrazones as Anti-Inflammatory Agents

Tangirala Sarala Devi, Galla Rajitha, Konda Swathi, Katari Sudheer Kumar, and Amineni Umamaheswari

1 Introduction

Neurodegenerative diseases are a group of chronic, progressive disorders characterized by the gradual loss of neurons in discrete areas of the central nervous system (CNS). The mechanisms underlying their progressive nature prevent inflammatory reactions, which are essential for the integrity and proper function of the CNS. Substantial evidence acknowledges a common inflammatory mechanism in various neurodegenerative diseases (Gao and Hong 2008). Acylhydrazone moieties which possess the structure R1R2C=NNHCOR are the most important pharmacophoric cores of several anti-inflammatory (dos Santos et al. 2014; Soujanya et al. 2017) antinociceptive (Barreiro et al. 1998), antiparkinson's (Turan-Zitouni et al. 2018), antimicrobial (Jayaveera 2012), antitubercular (Küçükgüzel et al. 1999), antitumor (Mohareb et al. 2011), antioxidant (Sibelsuzen et al. 2009; SaralaDevi et al. 2010), analgesic (Alexandre et al. 2014) and antimalarial (Walcourt et al. 2004) activities. Studies have revealed that various substitutions on the acyl carbon and imine carbon significantly affect the reactivity and biological activity of hydrazone moiety. Curcumin, a natural constituent of *Curcuma longa*, has a styryl carbonyl moiety in its structure and displays anti-inflammatory activity (Sreejayan Rao 1994). Curcumin and dehydrozingerone were reported to be potent scavengers of

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P. Vlamos (ed.), *GeNeDis 2018*, Advances in Experimental Medicine and Biology 1195, https://doi.org/10.1007/978-3-030-32633-3_18

A VALIDATED REVERSE PHASE-HPLC-PDA METHOD FOR ESTIMATION OF ZOLMITRIPTAN IN BULK AND DOSAGE FORMS

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ABSTRACT

The aim of the present work is to develop and validate a rapid, efficient and economical RP-HPLC method for the analysis of Zolmitriptan (ZMT) in bulk and dosage forms like tablets and mouth dissolving films (MDFs). ZMT was separated on Agilent Eclipse C_{18} column (150 x 4.6mm, 5µm) with a mobile phase composed of 0.02%v/v formic acid: methanol (75:25% v/v) in isocratic mode and eluents were monitored at 221 nm. ZMT was eluted at 3.3min and showed a good linearity in the concentration range of 2-10µg/mL with a correlation coefficient >0.999. The method was validated as per regulatory requirements. The developed HPLC method was successfully used for the analysis of ZMT in bulk and dosage forms like tablets and mouth dissolving films.

KEYWORDS: ***Zolmitriptan, PDA detection, Mouth dissolving films, Dissolution studies, Method validation.***

INTRODUCTION

Zolmitriptan is a second generation triptan used in the treatment of acute migraine attacks with or without aura and cluster headaches. Chemically, it is (S)-4-({3-[2-(dimethylamino) ethyl]-1H-Indol-5-yl} methyl)-1, 3-oxazolidin-2-one[1]. ZMT is a selective serotonin receptor agonist of the 1B and 1D subtype [2]. Various analytical methods have been reported in the literature for quantitative estimation of ZMT in several dosage forms like tablets by HPLC [3-6], spectrofluorimetry [7, 8] and stability indicating methods [9] and no validated methods were reported for the estimation of ZMT in MDFs. However the mobile phases in most of the methods consisted of phosphate buffer and ACN with longer retention times. Hence, the present investigation was aimed at developing a rapid and economic RP-HPLC-PDA method for the analysis of ZMT in tablet dosage forms and in mouth dissolving films.

MATERIAL AND METHODS

Chemicals

ZMT was a gift sample from Mylan Laboratories Ltd, Hyderabad, India. Formic acid, water and methanol were purchased from E. Merck, Mumbai, India.

Equipment

A RP-HPLC system (Shimadzu) comprising of Degasser (DGU-20A3), Binary pump (LC-20AD), an Auto sampler (SIL 20- AC HT), and PDA detector (SPD M20A) was used for the analysis of ZMT in different samples. Shimadzu LC solution software was used to collect and process the data. Separation was achieved on Agilent Eclipse C_{18} column (150 × 4.6mm, 5 µm).

Chromatographic Conditions

Mobile phase consisting of 0.02% v/v formic acid: methanol (78:22 v/v) was used in isocratic mode and filtered through membrane filter of 0.45µm (Millipore) and pumped at a flow rate of 1 mL/min. The injection volume was 10µL and eluents were monitored at 221nm.

Preparation of Stock and Standard Solutions

DEVELOPMENT OF VALIDATED RP-HPLC-PDA METHOD FOR THE ANALYSIS OF ALMOTRIPTAN IN BULK AND DIFFERENT DOSAGE FORMS AND IN DISSOLUTION SAMPLES

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ABSTRACT

The aim of the present work is to develop and validate a rapid, efficient and economical RP-HPLC-PDA method for the analysis of Almotriptan (AMT) in bulk and dosage forms like tablets and mouth dissolving films (MDFs). AMT was separated on Agilent Eclipse C_{18} column (150 x 4.6mm, 5µm) with a mobile phase composed of 0.02%v/v formic acid: methanol (70:30% v/v) in isocratic mode and eluents were monitored at 227 nm. AMT was eluted at 3.73min and showed a good linearity in the concentration range of 2-10µg/mL with a correlation coefficient >0.999. The validation parameters like specificity, linearity, accuracy and limit of detection, limit of quantification, precision, robustness are all fulfilled as per regulatory requirements. The developed HPLC method was successfully used for the analysis of AMT in bulk and dosage forms like tablets and mouth dissolving films.

KEYWORDS: *Almotriptan, PDA detection, Mouth dissolving films, Dissolution studies, Method validation.*

INTRODUCTION

Almotriptan malate is a serotonin receptor agonist used in the acute treatment of migraine headache with or without aura, in adults and adolescents aged 12 to 17 years. Chemically, AMT is known as 1-[[[3-[2-(Dimethylamino) ethyl]-1H-indol-5-yl] methyl] sulfonyl] pyrrolidine [1]. AMT stimulates specific serotonin receptors in intracranial blood vessels and sensory trigeminal nerves thereby promoting vascular constriction and providing relief from migraine [2]. Various analytical methods have been reported in the literature for quantitative determination of AMT individually in several dosage forms by HPLC [3-5], HPTLC [6], fluorimetry [7], UV spectrophotometry [8, 9] and by LC-MS [10, 11] and no validated method was reported for the estimation of AMT in mouth dissolving films. However the mobile phases in most of the methods consisted of phosphate buffer and ACN with longer retention times. Hence, the present investigation was aimed at developing a rapid and economic RP-HPLC-PDA method for the analysis of AMT in tablet dosage forms and in mouth dissolving films.

MATERIALS AND METHODS

Chemicals

Almotriptan was a gift sample from Mylan Laboratories Ltd, Hyderabad, India. Formic acid, water and methanol were purchased from E. Merck, Mumbai, India.

Equipment

A Shimadzu Prominence HPLC system provided with DGU-20A3 degasser, LC-20AD binary pumps, SIL-20ACHT auto sampler, and SPD-M20A PDA detector was used. All the data was processed using LC solutions software. The chromatographic analysis was performed on Agilent Eclipse C_{18} column (150 × 4.6mm, 5µm).

ChromatographicConditions

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DEVELOPMENT AND VALIDATION OF RP-HPLC-PDA METHOD FOR THE ANALYSIS OF RIZATRIPTAN IN BULK AND DIFFERENT DOSAGE FORMS AND IN DISSOLUTION SAMPLES

SUDHIR M[1], PAVAN KUMAR M[2], MAHA LAKSHMI U[2], BUCHI N. NALLURI[3]*

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ABSTRACT

The aim of the present work is to develop and validate a rapid, efficient and economical RP-HPLC-PDA method for the analysis of Rizatriptan (RZT) in bulk and dosage forms like tablets and mouth dissolving films (MDFs). RZT was separated on Agilent Eclipse C_{18} column (150 x 4.6mm, 5µm) with a mobile phase composed of 0.02%v/v formic acid: methanol (78:22% v/v) in isocratic mode and eluents were monitored at 221 nm. RZT was eluted at 3.01min and showed a good linearity in the concentration range of 2-10µg/mL with a correlation coefficient >0.999. The validation parameters like specificity, linearity, accuracy and limit of detection, limit of quantification, precision, robustness are all fulfilled as per regulatory requirements. The developed HPLC method was successfully used for the analysis of RZT in bulk and dosage forms like tablets and mouth dissolving films.

KEYWORDS: *Rizatriptan, PDA detection, Mouth dissolving films, Dissolution studies, Method validation.*

INTRODUCTION

Rizatriptan benzoate (RZT) is an antimigraine drug used to treat migraine. Chemically, it is N, N dimethyl-5-(1H-1, 2, 4-triazol-1-ylmethyl)-1H-indole-3-ethanaminemonobenzoate [1]. It is a selective 5-hydroxytryptamine 1B/1D (5-HT1B/1D) receptor agonist. It stimulates the 5-HT1B/1D receptor blocking neuronal transmission of vasoactive neuropeptides and reverse dilation of cranial vessels associated with migraine [2]. Various analytical methods have been reported in the literature for quantitative determination of RZT individually in several dosage forms like tablets by HPLC[3-5] UV spectrophotometry[6, 7], fluorimetry[8] and no validated method was reported for the estimation of RZT in MDFs. However the mobile phases in most of the methods consisted of phosphate buffer and ACN with longer retention times. Hence, the present investigation was aimed at developing a rapid and economic RP-HPLC-PDA method for the analysis of RZT in tablet dosage forms and in mouth dissolving films.

MATERIALS AND METHODS

Chemicals

RZT was a gift sample from Mylan Laboratories Ltd, Hyderabad, India. Formic acid, water and methanol were purchased from E. Merck, Mumbai, India. RZT was available as tablets with brand name RITZA (manufactured by NATCO Pharma Limited, Kothur) with a labeled claim of 5mg.

Equipment

A Shimadzu Prominence HPLC system provided with DGU-20A3 degasser, LC-20AD binary pumps, SIL-20ACHT auto sampler, and SPD-M20A PDA detector was used. All the data was processed using LC solutions software. The chromatographic analysis was performed on Agilent Eclipse C_{18} column (150 × 4.6mm, 5µm).

Chromatographic Conditions

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SP-89

A QUALITATIVE STUDY EXPLORING PATIENT PERCEPTION ON THE ROLE OF PHARMACIST BASED PATIENT COUNSELLING IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Patient counseling refers to the process of providing information, advice and assistance to help patient use their medication appropriately. A prospective observational study was carried out in patients admitted to Dr. Pinnamneni Siddhartha Institute of Medical Sciences and Research Foundation for a period of 6 months. Questionnaire was divided into 3 parts and was analyzed using Likert's scale. Statistical analysis was done using graph pad prism. Results obtained from the study shows that 324(32.45) of patients agreed and 296(29.6%) of patients strongly agreed to the patient counseling. 464(46.4%) patients felt that pharmacists provide medication counseling, 490(49.0%) of patients perceived that pharmacists had given enough time. A large number of participants 489(48.9%) considered pharmacist as an expert in drug related matters.Majority of participants 806(80.6%) in the study felt that pharmacist provided them with thorough medication counseling which is quite evident that participants are very clear about the primary responsibilities of pharmacist and deliver the same in the optimal by encouraging them to ask questions.As the counseling was done in regional language Telugu 990(99%) of participants were satisfied with the language used by the pharmacist during counseling session. The results of the study shows that a pharmacist based patient counseling services are positively associated with pharmacist knowledge related to drugs, time provided by the pharmacist to the patients, medication history interview and language used by the pharmacist.

KEYWORDS: *Pharmacist, patient counseling, public perception, patient adherence*

INTRODUCTION

Over the past four decades the pharmacist profession has made considerable efforts to shift its focus from medication supply to direct patient care[1]. Patient counseling refers to the process of providing information, assessing the patient, understanding of drug therapy, proper use and adverse effects of medications and motivating the patient to take an active role in health management[2-3]. Pharmacies are recognized as the most accessible health care setting due to high number of patients using their services[4].Hence, pharmacists are well positioned to help in improving medication adherence, educating patient about disease, reducing medication errors, management of patients medical condition and improving patient outcomes and satisfaction with care[5]. The pharmacists features for better patient counseling includes establishing trust among the patients, with effective verbal and non-verbal communication skills, asking open-ended questions, providing privacy and confidentiality and motivating the patients[6-7]. A constructive pharmacist-patient relationship is essential for effective health care practice and optimal well being of the patient[8]. The profession of pharmacy, pharmaceutical care and patient counseling services has become well popularized all over the world[9]. In India patient counseling services are not well established and most of the patients unaware about the pharmacists participation and patient counseling[10-11]. Hence this study was initiated to know public perceptions towards counseling and to know whether they are satisfied with their services. We

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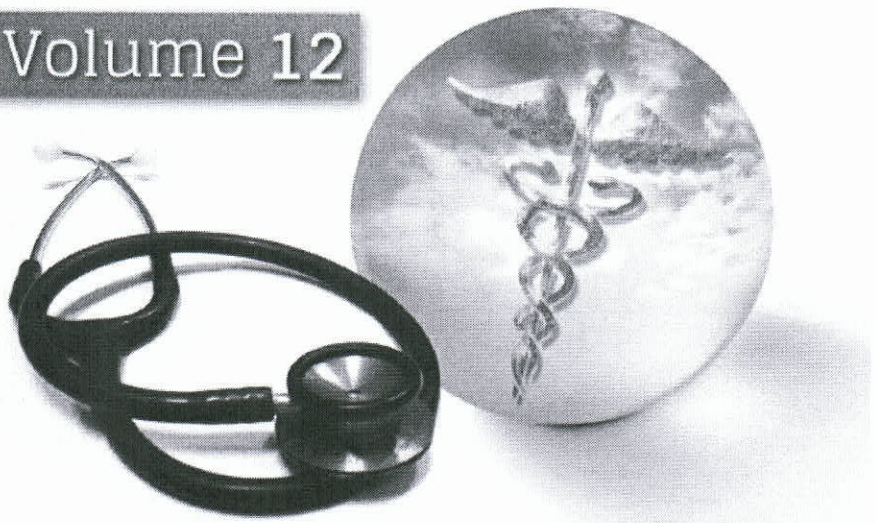

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Chapter 8

FLOOD BORNE DYSENTERY

Kanaka Durga Devi Nelluri*, Haritha Kondepati, Naveen Babu Kilaru and Navya Sree Thota

KVSR Siddhartha College of Pharmaceutical Sciences, Vijayawada, Andhra Pradesh, India

ABSTRACT

Dysentery is an intestinal inflammation affecting the colon with severe abdominal cramps, causing severe diarrhea with mucus or blood in feces. The impact of the long-term climatic changes poses a high disease burden on dysentery. The antimicrobial resistance patterns, cross-regional and seasonal variations, causative agents, and advanced trends in morbidity and mortality are some reasons to determine dysentery outbreaks. The temperature, rainfall, and humidity also have their crucial part in transmitting the infection. The long-term moderate flooding has a low morbidity risk, whereas, and it is very high in sudden and massive flooding. Amoebic, bacillary and Trichuris are most common among the types of flood-borne dysentery. These infectious diseases are serious public health concern during and after the flooding. Their diagnosis includes endoscopy, ultrasound scan, microscopic stool examinations, and other advanced

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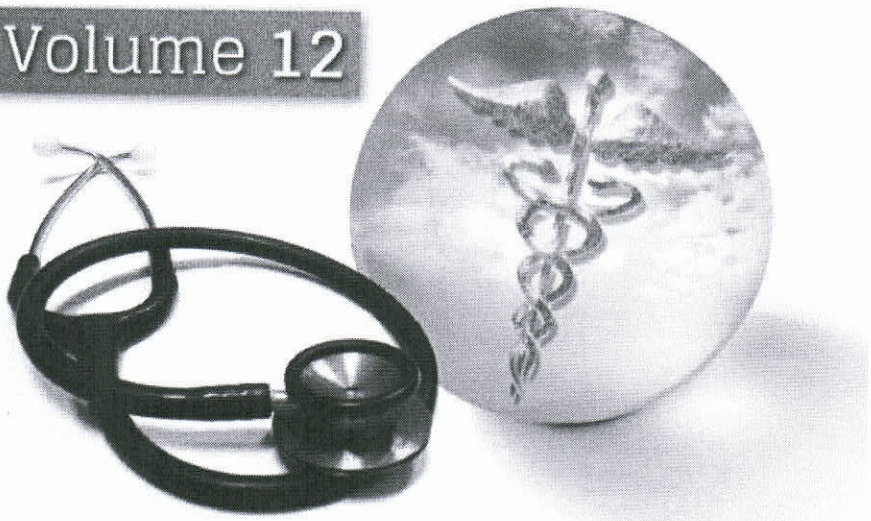

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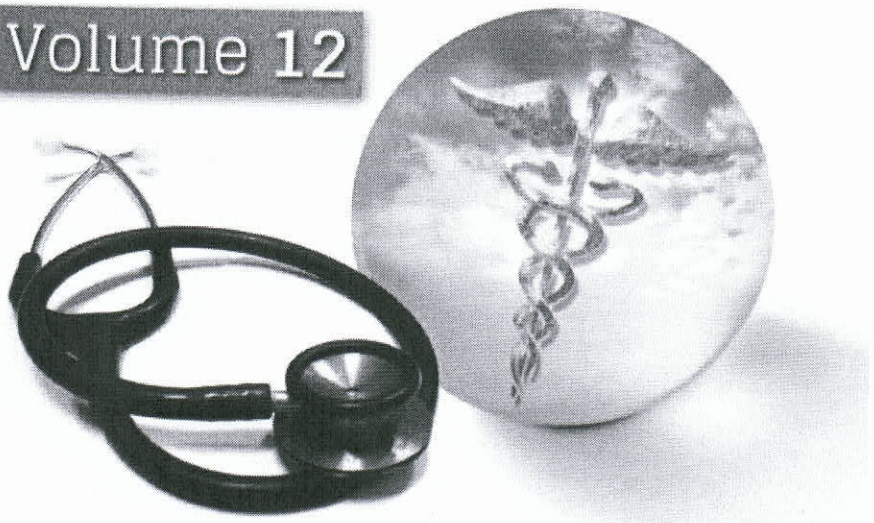

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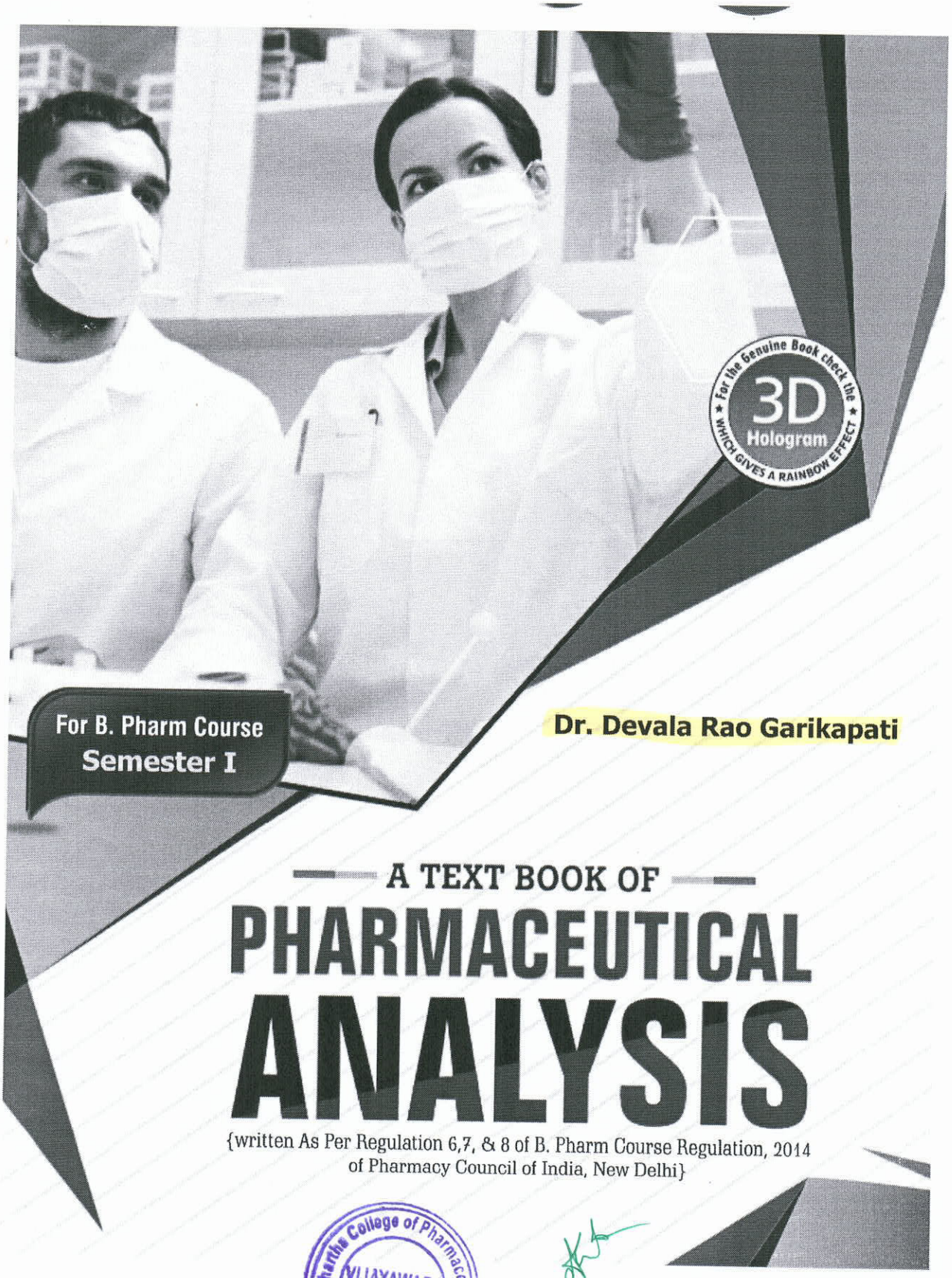

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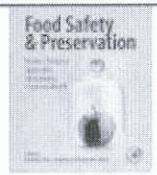

Chapter 9 - Challenges in Emerging Food-Borne Diseases

K.D. Devi Nelluri, Navya Sree Thota

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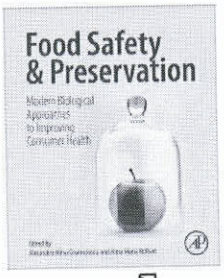
Abstract

Food is an excellent vehicle by which many pathogens can reach an appropriate colonization site in a new host. The burden of diseases caused by these food-borne pathogens remains largely unknown. Concern over pathogenic and spoilage microorganisms in foods is increasing due to the increase in outbreaks of food-borne diseases (FBDs). Food safety procedures are critical to reducing pathogen caused FBDs. Although food production



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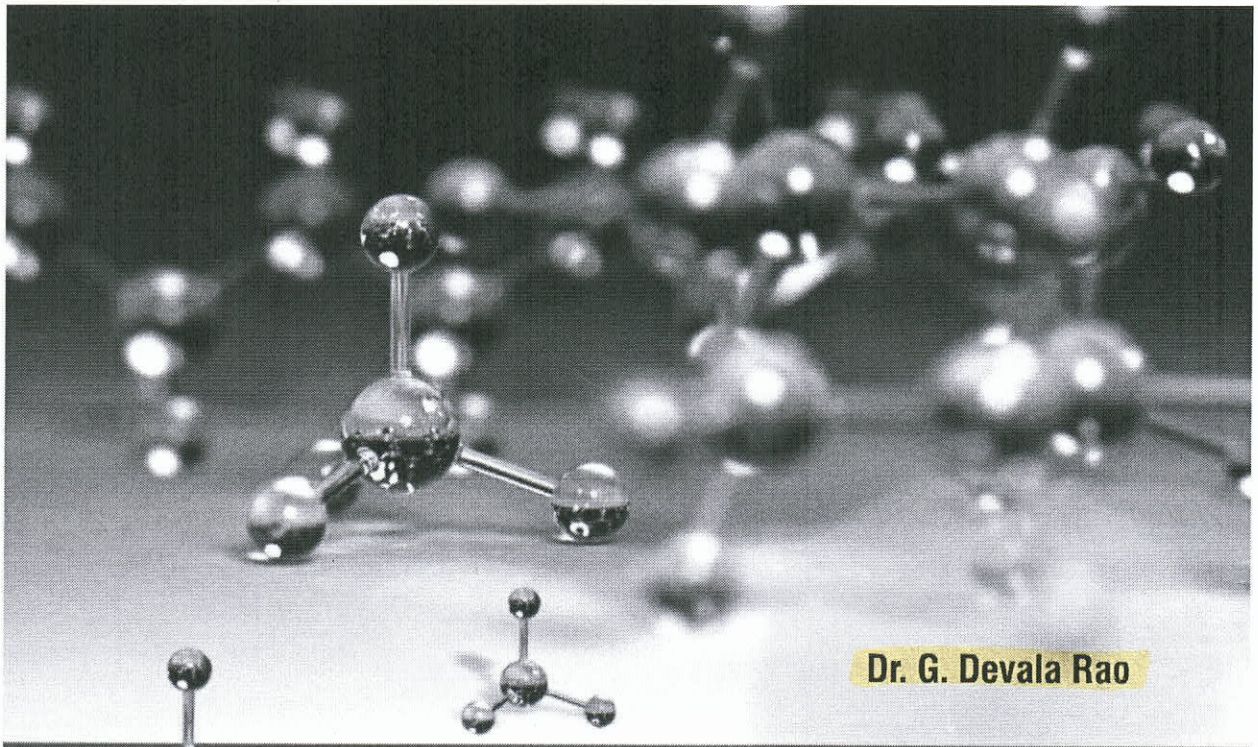

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