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AN OBSERVATIONAL STUDY ON ANTIBIOTIC USAGE PATTERNS IN DERMATOLOGICAL DISORDERS



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Introduction:

Bacterial skin infections contribute significantly to outpatient visits in dermatology and require effective antibiotic management. Antibiotics, derived from microorganisms, act by suppressing or killing pathogenic organisms, thereby facilitating recovery and preventing complications such as secondary infections (1). The World Health Organization (WHO) developed core indicators and the AWARE classification to promote rational antibiotic use and curb antimicrobial resistance (2). This study aims to evaluate antibiotic prescribing trends in dermatological disorders and assess their compliance with WHO guidelines.

Materials and Methods:

A cross-sectional observational study was conducted over six months (July–December 2022) in the Department of Dermatology, Venereology, and Leprosy (DVL) with ethical clearance. Data from 200 prescriptions of patients with bacterial and inflammatory skin disorders

were analyzed using Microsoft Excel. WHO prescribing indicators included average number of drugs per encounter, percentage of encounters with antibiotics, injections, and drugs from the Essential Medicines List (EML) (2).

Results:

Out of 200 patients, 64% were male, and the majority (36%) were aged between 21–40 years. The most frequently reported conditions were secondary pyoderma over eczema (30%) and psoriasis (10%), followed by furuncles, impetigo, and folliculitis. Cephalexin and amoxicillin were the most prescribed antibiotics (32% each), predominantly through the oral route (80%). Topical agents included silver sulfadiazine (45%) and fusidic acid (40%).

The average number of drugs per encounter was 3.4. Encounters with antibiotics were 4.5%, injections 12%, and EML compliance was 43%. According to the WHO AWARE classification, 57% of antibiotics were from the Access group and 43% from the Watch group, indicating preference for low-resistance potential drugs (3,4).

Discussion:

This study's gender distribution aligns with similar Indian studies showing male predominance in SSTIs (5,6). The age-wise prevalence, particularly among the 21–40 group, reflects findings from Sultana et al. (7). Cephalexin and amoxicillin are commonly prescribed for conditions like folliculitis and impetigo, consistent with WHO recommendations (8). Although oral administration was most preferred, injectable formulations like benzathine penicillin and cefotaxime were also used (9). Topical silver sulfadiazine and fusidic acid were favored over mupirocin, contrary to trends in other studies (10).

The study reveals that antibiotic prescribing patterns comply with WHO standards for injection and antibiotic use (<20% and <30%, respectively) but fall short in EML adherence (43% vs. WHO target of 100%) (2). Short treatment duration (≤ 1 week in 92%) aligns with global best practices in uncomplicated SSTI management (8).

Conclusion:

The prescribing pattern observed in this study reflects rational antibiotic use, with a preference for Access group antibiotics as per AWARE classification. Patient education on hygiene, avoidance of OTC medications, and early medical consultation is vital to reduce secondary infections and prevent antimicrobial resistance.

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MIFEPRISTONE IN SECOND-TRIMESTER ABORTION



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Introduction

Mifepristone, an anti-progesterone medication, plays a crucial role in medical abortion procedures, including second-trimester terminations. When combined with misoprostol, it enhances efficacy, reduces the induction-to-abortion interval, and lowers complications. This newsletter explores its role, effectiveness, safety, and recent research findings in second-trimester abortions.

Mechanism of Action

Mifepristone blocks progesterone receptors, causing endometrial breakdown, cervical softening, and increased uterine sensitivity to prostaglandins like misoprostol. This leads to efficient expulsion of the fetus and placenta.

Clinical Efficacy and Safety

Several studies confirm that mifepristone, when used with misoprostol, significantly improves abortion outcomes compared to misoprostol alone. It reduces time to abortion, minimizes misoprostol dosage, and

lowers complication rates. Side effects such as nausea, fever, and diarrhea are generally mild and manageable.

Recent Research and Guidelines

- World Health Organization (WHO) Guidelines** – WHO recommends mifepristone (200 mg) followed by misoprostol (800 mcg) for second-trimester medical abortion due to its high success rate and safety profile. (Source: WHO Abortion Care Guidelines, 2022)
- American College of Obstetricians and Gynecologists (ACOG) Recommendations** – ACOG supports the use of mifepristone in second-trimester abortions, stating that it improves efficacy and reduces misoprostol doses needed. (Source: ACOG Practice Bulletin No. 225, 2020)
- Clinical Trials on Efficacy** – A 2021 study in Obstetrics & Gynecology found that the addition of mifepristone reduced abortion duration from 15 hours (misoprostol alone) to 9 hours. (Source: Lohr et al., Obstetrics & Gynecology, 2021)
- Comparative Study on Side Effects** – Research published in The Lancet (2020) showed that mifepristone-misoprostol regimens had fewer gastrointestinal side effects than misoprostol-only protocols. (Source: Chai et al., The Lancet, 2020)
- Global Availability and Barriers** – A review in BMJ Global Health (2022) highlighted challenges in accessing mifepristone, including legal restrictions and supply issues in several countries.

Conclusion

Mifepristone is a vital component in second-trimester medical abortion, ensuring better outcomes and patient comfort. Ongoing research and advocacy are crucial to expanding access and optimizing protocols worldwide.

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STEM CELL THERAPY: PIONEERING A NEW ERA IN CHRONIC DISEASE TREATMENT



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Stem cell therapy has emerged as a groundbreaking approach in regenerative medicine, offering new hope for patients suffering from chronic diseases. This therapy harnesses the unique properties of stem cells to regenerate, repair, and replace damaged tissues and organs, thereby addressing the root causes of many chronic conditions.

Introduction to Stem Cell Therapy

Stem cell therapy involves the use of stem cells—undifferentiated cells capable of self-renewal and differentiation into specialized cell types—to treat or prevent diseases. It is being explored for various chronic conditions, including neurodegenerative diseases, cardiovascular diseases, autoimmune disorders, and diabetes.

Types of Stem Cells Used in Therapy

a) Embryonic Stem Cells (ESCs)

- Derived from early-stage embryos.
- Pluripotent (can differentiate into any cell type).
- Ethical concerns and risk of tumorigenesis limit their widespread use.

b) Adult Stem Cells (ASCs)

- Found in tissues like bone marrow, blood, and fat.
- Multipotent (can differentiate into limited cell types).
- Examples: Mesenchymal stem cells (MSCs), hematopoietic stem cells (HSCs).

c) Induced Pluripotent Stem Cells (iPSCs)

- Adult cells reprogrammed to behave like embryonic stem cells.
- Avoid ethical issues and offer patient-specific treatment potential.

d) Perinatal Stem Cells

- Derived from umbilical cord blood, amniotic fluid, and placenta.
- Have both multipotent and pluripotent characteristics.

Mechanisms of Action in Chronic Disease Treatment

Stem cells contribute to disease treatment through various mechanisms:

1. Regeneration & Repair: Replace damaged cells and tissues.
2. Anti-Inflammatory Effects: Reduce chronic inflammation.
3. Immunomodulation: Regulate immune system responses.
4. Paracrine Effects: Secrete growth factors that promote healing.

Applications in Chronic Disease Treatment

a) Neurological Disorders

- Parkinson's Disease: Stem cells differentiate

into dopamine-producing neurons.

- Alzheimer's Disease: Potential to replace lost neurons and reduce neuroinflammation.
- Spinal Cord Injury: Regenerate damaged nerve tissues.

b) Cardiovascular Diseases

- Heart Failure: MSCs and cardiac stem cells improve heart muscle regeneration.
- Myocardial Infarction (Heart Attack): Promote angiogenesis (formation of new blood vessels).

c) Diabetes

- Type 1 Diabetes: iPSCs or pancreatic stem cells may restore insulin-producing beta cells.
- Type 2 Diabetes: MSCs help regulate immune response and reduce inflammation.

d) Autoimmune Disorders

- Rheumatoid Arthritis: MSCs suppress autoimmune responses and reduce joint damage.
- Multiple Sclerosis: Repair myelin sheath damage and modulate the immune system.

e) Orthopedic Conditions

- Osteoarthritis: Cartilage regeneration using MSCs.
- Bone Defects: Stem cells enhance bone healing in fractures and osteoporosis.

f) Liver & Kidney Diseases

- Cirrhosis: Stem cells promote liver tissue regeneration.
- Chronic Kidney Disease: MSCs reduce fibrosis and enhance kidney repair.

Advantages of Stem Cell Therapy

- **Minimally Invasive:** Many procedures use injections instead of surgery.
- **Personalized Medicine:** Patient-derived stem cells reduce immune rejection.
- **Potential to Cure:** Unlike conventional treatments, stem cell therapy targets disease mechanisms.

Challenges & Ethical Concerns

- **Ethical Issues:** Use of embryonic stem cells is controversial.
- **Tumorigenesis Risk:** Uncontrolled cell growth may lead to cancer formation.
- **Immune Rejection:** Despite autologous (self-derived) use, immune response issues remain.
- **Regulatory Barriers:** Approval and standardization of stem cell treatments are still evolving.

Future Prospects & Research Directions

- **Gene Editing with CRISPR:** Enhancing stem cell efficacy by correcting genetic mutations.
- **3D Bioprinting:** Creating functional tissues and organs from stem cells.
- **Clinical Trials & FDA Approvals:** Ongoing studies aim to standardize and validate therapies.

Conclusion

Stem cell therapy is revolutionizing chronic disease treatment, offering potential cures where conventional medicine falls short. Despite challenges, advancements in stem cell research, bioengineering, and personalized

medicine will likely shape the future of regenerative therapies.

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THE POTENTIAL ROLE OF VITAMIN K IN NEUROPROTECTION AND ALZHEIMER'S DISEASE



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Introduction

Vitamin K, a fat-soluble vitamin primarily known for its role in blood clotting and bone metabolism, is gaining attention for its potential neuroprotective effects. Recent research suggests that Vitamin K may play a crucial role in brain health and could be a significant factor in preventing or slowing the progression of Alzheimer's disease (AD). This newsletter explores the connection between Vitamin K and neuroprotection, shedding light on the latest scientific insights.

Vitamin K and Brain Function

Vitamin K exists in two main forms: phyloquinone (Vitamin K1) found in leafy greens and menaquinones (Vitamin K2) derived from fermented foods and animal sources. It is essential for the synthesis of sphingolipids, critical components of neuronal membranes that influence cognition and memory. Vitamin K is also involved in the regulation of inflammation and oxidative stress, both of which are implicated in neurodegenerative diseases.

The Link Between Vitamin K and Alzheimer's Disease

Alzheimer's disease is characterized by the accumulation of beta-amyloid plaques and tau tangles in the brain, leading to neuronal damage and cognitive decline. Emerging research indicates that Vitamin K may help mitigate these pathological processes through:

- **Anti-inflammatory properties:** Reducing neuroinflammation, a key contributor to AD progression.
- **Antioxidant effects:** Protecting neurons from oxidative stress and apoptosis.
- **Sphingolipid metabolism:** Enhancing neuronal function and communication.
- **Regulation of calcium balance:** Preventing excitotoxicity, a condition linked to neuronal death in AD.

Dietary Sources and Recommendations

To optimize Vitamin K levels, consider incorporating these foods into your diet:

- **Vitamin K1:** Spinach, kale, broccoli, Brussels sprouts.
- **Vitamin K2:** Natto (fermented soybeans), cheese, eggs, and meats.

Although there is no specific recommendation for Vitamin K intake related to brain health, maintaining an adequate intake is essential for overall well-being. Consult a healthcare provider before considering supplementation.

Conclusion:

Vitamin K shows promising potential in neuroprotection and Alzheimer's disease management. While more research is needed to establish definitive links, ensuring sufficient Vitamin K intake through a balanced diet may support cognitive function and long-term brain health.

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INNOVATIONS IN CANCER BIOMARKERS: PIONEERING EARLY DETECTION, PRECISION THERAPY, AND PERSONALIZED ONCOLOGY



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Adverse drug reactions (ADRs) are major challenges in drug discovery, threatening patient safety and dramatically increasing healthcare expenditures. Since ADRs are not as visible as infectious diseases, the potential consequences are considerable. Early detection of ADRs is an essential indicator of a drug's viability and safety profile. The application of these modern computational methods allows for the rapid, thorough, and precise prediction of probable ADRs even before the drug's practical synthesis as well as preclinical and clinical trials, resulting in more efficient and safer medications with a lesser chance of drug's withdrawal. The following steps are involved in ADR management.

Early Detection and Prediction of ADRs:

- AI-powered algorithms can analyze large datasets from electronic health records, spontaneous reporting systems, and real-world data sources to detect signals and patterns indicative of potential ADRs.
- Machine learning models can predict the likelihood of ADRs occurring, even for rare or delayed-onset reactions, enabling proactive risk management.

Improved Risk Assessment and Communication:

- AI can assist in the assessment of ADR severity, causality, and risk factors, supporting better-informed decision-making and risk mitigation strategies.
- AI-generated insights can be used to enhance communication about drug safety to healthcare providers, patients, and regulatory bodies.

Optimization of Pharmacovigilance Processes:

- AI can streamline and automate various pharmacovigilance tasks, such as case processing, data validation, and trend analysis, improving efficiency and reducing costs.
- The integration of AI into pharmacovigilance systems can free up resources for more complex tasks, such as signal investigation and risk management.

In summary, the role of AI in ADR management is transformative, enabling more proactive, efficient, and accurate identification, evaluation, and communication of drug safety issues, ultimately enhancing patient safety and the overall pharmacovigilance process.

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DEPARTMENTAL ACTIVITIES

ECP Students Shine at National Zonal Championship

A team of students from Erode College of Pharmacy (ECP) participated in the National Zonal Championship held at IIT Delhi on March 22–23, 2025. The team, comprising Ms. Rubiya Jasrine (Pharm.D), Mr. Branham Bright (Pharm.D), Mr. V. Sundareswaran (B. Pharm), and Mr. A. Praveen Kumar (B.Pharm), showcased their innovative idea, CLINICHAIN.

CLINICHAIN: Revolutionizing Clinical Trials

CLINICHAIN is a blockchain-powered platform that integrates smart contracts, AI, and IoT to streamline clinical trials. The platform addresses key challenges such as delayed milestone payouts, data integrity issues, and inefficient participant tracking. By leveraging Ethereum/Polygon for secure transactions and AI algorithms for faster participant screening, CLINICHAIN offers an efficient solution to accelerate drug development.

The team delivered a 7-minute pitch, followed by a 3-minute Q&A session, where they effectively addressed judges' questions on scalability, security, and feasibility.

Participating in the National Zonal Championship was an enriching experience for the team, enhancing their knowledge, improving their communication skills, and strengthening their technical expertise.

The management, principal, and staff of Erode College of Pharmacy, Erode, congratulate the students on their remarkable achievement in the pharmacy profession.



World Hypertension Day

On observance of World Hypertension Day 2024, The Tamil Nadu Dr.M.G.R Medical University, Chennai and The Erode College of Pharmacy, Erode set up a Camp on 'Blood Pressure Screening for All' on June 11, 2024 from 10 a.m. in the College Campus. Organized by Department of Pharmacy Practice and NSS. During the Camp the Pharm.D fourth year students participated as volunteers for screening and data entering. Nearly 200 people including Teaching, Non-teaching staff(s) and students were screened for blood pressure and random blood glucose level.



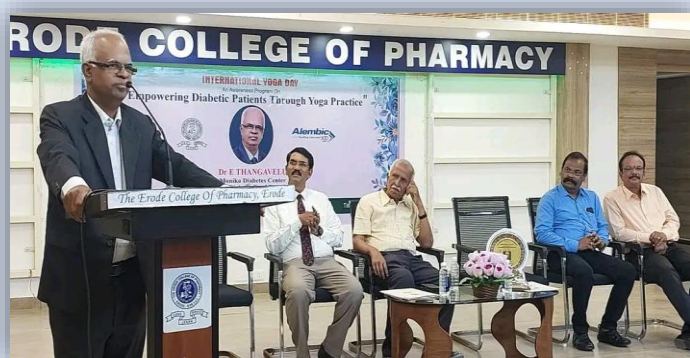
ONE DAY WORKSHOP

The Erode College of Pharmacy, Erode, organized a one-day workshop on "Maximizing Potential: The Role of Scientists in Building a Career in IPR." The session was conducted by Dr. Umesh Banakar, President of Banakar Consulting Services, USA. The workshop aimed to provide insights into *intellectual property rights (IPR)* and career opportunities for scientists in this field. Around 25 faculty members and 210 students actively participated, engaging in discussions on patents, trademarks, and the importance of IPR in pharmaceutical sciences. The event helped students understand how IPR can shape their careers and contribute to scientific advancements.



International Yoga Day

The Erode College of Pharmacy, Erode, organized an "International Yoga Day" Awareness Program on "Empowering Diabetic Patients through Yoga Practice" on June 21, 2024, at 3:00 PM. Dr. E. Thangavelu, a diabetology expert from Monika Diabetic Center, delivered a special lecture on the prevention and treatment of diabetes, raising awareness among students and staff. The event emphasized the role of yoga in diabetes management. More than 300 students and 50 staff members actively participated, gaining valuable insights into healthy living and disease prevention through yoga and lifestyle modifications.



International Yoga Day Awareness Program

The Erode College of Pharmacy, Erode, organized an International Yoga Day awareness program on June 21, 2024, at 2:00 PM. More than 50 girl students, along with the Physical Director, actively participated in the session. The event emphasized the benefits of daily yoga practice for a healthy lifestyle. A special lecture on the importance of yoga was delivered by the yoga master, highlighting its role in physical and mental well-being. The session aimed to inspire students to incorporate yoga into their daily routine for a healthier and stress-free life.

