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Editorial

Evolving new drugs & pharmaceutical chemistry in country

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1. Scenario

Pharmaceutical Chemistry involves drug development and aims therapeutic cure, remedies for disease, analytical techniques, pharmacology, metabolism, quality assurance, and drug chemistry as a composite. The 2015 Nobel Prize in Medicine, was shared by Professor Youyou Tu, who devolved formulation of artemisinin, a natural product antimalarial drug, developed from Chinese Medicine. Nanoparticle formulations were found to be more effective.

The first modern synthetic drug to be developed in India was Urea Stibamine in 1922 by UN Brahmachari against visceral leishmaniasis. Visceral leishmaniasis was a severe health burden during the early part of the 20th century, and it was a life saving drug for a large section of the population.

2. Drug Development in India

Most of the formulations and new drugs are from western world and prior to the patent process, they were marketed in country, making the domestic formulations affordable. Quality remained the issue, but was solved by the recent introduction of mandatory GMP for all manufacturers. Despite being long in drug sector, India can boast of few discoveries. The research on the pharmacology of Rauwolfia alkaloids alkaloids was carried out by Chopra and his associates since 1933. Reserpine It was used as a treatment for high blood pressure and psychotic episodes and was in medical texts till 1980. Hamycin a topical antifungal was discovered in 1963 from Streptomyces pimprina, was effective in treatment of candidiasis. Levonadifloxacin (intravenous) and its oral prodrug alalevonadifloxacin (Wockhardt limited) are broad-spectrum antibacterial agents developed for the treatment of difficult-to-treat infections caused by multidrug-resistant Gram-positive bacteria, especially methicillin resistant Staphylococcus aureus, atypical bacteria, anaerobic bacteria, and biodefence pathogens as well as Gram-negative bacteria, approved by CDCSO in 2019.[1]

The phase III study was completed in India, comparing levonadifloxacin (intravenous and oral) to the gold-standard anti-MRSA drug linezolid. The currently used MRSA drugs such as vancomycin, teicoplanin, daptomycin, and linezolid have adverse reactions such as nephrotoxicity, bone-marrow depression, and muscle toxicity and thus cannot be given to patients with compromised kidney/liver function or critically ill patients who require chronic therapy, making use of these fluoroquinolones more suitable.[2]

Diabetic population in India is about 77 Million cases making it a large market for antidiabetic drugs. Traditional drugs such as Allium sativum, Eugenia jambolana, Momordica charantia Ocimum sanctum, Phyllanthus amarus, Pterocarpus marsupium, Tinospora cordifolia, Trigonella foenum graecum and Withania somnifera, have been commonly used for therapy as monotherapy or as combination therapy. Active formulations using alkaloids

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are also available.

Synthetic molecules recently developed are balaglitazone (DRF-2593) and ragaglitazar (DRF-2725) of Dr Reddy's Lab Ltd, saroglitazar (ZYH1) of Zydus Cadila, melogliptin (GRC-8200) of Glenmark Pharmaceuticals, BLX-1002 of Orchid Pharma. These were under various phases of clinical trials in 2021 and intended to be marketed globally. Further, India through its fine knowledge of biotechnology has developed many biosimilars and many lead Indian companies such as Intas, Reliance Life Sciences, Sun Pharma etc are marketing these products in India and Globally at much lesser cost providing benefit to the needy patients.

Pharmaceutical chemistry is thus focused on quality aspects of medicines and aims to assure fitness for purpose of medicinal products by analysing & evaluating them as per the quality control standards. Generally integrated approach is preferred for drug development.

Papers in the current issue focus on various issues on Pharmaceutical Chemistry and Analysis, providing the suitable insights to the reader.[3–7]

3. Conflict of Interest

None.

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