



RESEARCH ARTICLE

APPLICATION OF MODEL INDEPENDENT APPROACH ON *IN VITRO* RELEASE OF EXTEMPORANEOUSLY PREPARED SEMISOLID FORMULATIONS CONTAINING METRONIDAZOLE WITH MARKETED SILVER SULFADIAZINE 1% CREAM, USP: A COMPARATIVE INVESTIGATION

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In an attempt for better treatment of bacterial infections, various semisolid formulations containing 5% w/w of metronidazole were prepared and evaluated for *in vitro* drug release and *in vitro* skin permeability using dialysis membrane and rat abdominal skin respectively using model independent approach. The f_1 lower than 15 and f_2 higher than 50 indicated similarities in the *in vitro* diffusion and permeation profiles of the extemporaneously prepared selected semisolid formulations and marketed silver sulfadiazine 1% cream, USP. Amongst all the semisolid formulations prepared, carbopol gel base was found to be most suitable dermatological base for metronidazole and the results obtained for *in vitro* diffusion and *in vitro* skin permeation studies were comparable with that of marketed silver sulphadiazine 1% cream, USP.

Key words: Semisolid formulation, Ointment, Metronidazole, Silver sulfadiazine.

INTRODUCTION

Topical antibiotics can play an important role in prevention and treatment of many primary cutaneous bacterial infections commonly seen in dermatological practice like localized superficial infections due to surgery, injury and abrasion. Topical antimicrobials help in preventing entry of microorganism into wound, which leads to fast healing of wounds (Benner *et al* 1999; Sable and Murakawa, 2003).

Metronidazole is a nitroimidazole antibiotic (**Figure 1**) classified in the WHO Essential Medicines List as antiamoebic, anti-giardiasis, and antibacterial (WHO, 2009). Approved indications include treatment of trichomoniasis, vaginitis, and urethritis caused by *Gardnerella vaginalis*, giardiasis, amoebiasis, and infections caused by anaerobic bacteria (ANVISA, 2009),

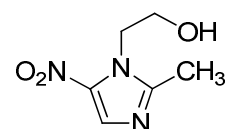


Fig. 1. Structure of metronidazole

which comprise intraabdominal infections, skin and skin structure infections, gynecologic infections, bacterial septicemia, bone and joint infections, central nervous system infections, lower respiratory tract infections, and endocarditis. The objective of the present study was to prepare various topical drug delivery systems such as gels and ointments and to evaluate and compare *in vitro* diffusion and permeation profile of prepared formulation with marketed silver sulfadiazine cream 1% USP.