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A promising approach to provide appropriate colon target drug delivery systems of Vancomycin HCl: Pharmaceutical and microbiological studies

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The aim of this study was to prepare colon target drug delivery systems of vancomycin HCl in an attempt to provide an orally administered dosage form for systemic effect. Tablet matrices containing different concentrations of guar gum (10-60% of tablet weight, F1-F6) were prepared by direct compression method and subjected to *in-vitro* release studies to explore the ability of guar gum in achieving sustained drug release in the colon. Various release retarding synthetic and natural polymers namely; hydrogenated castor oil, hydroxypropyl methyl cellulose, xanthan gum, ethyl cellulose and Eudragit RL 100; were incorporated to modify the drug release rate from the guar gum matrix tablet (F6). Different 15 matrix tablet formulations (F6-F20) were enteric coated with hydroxypropyl methyl cellulose phthalate as an enteric polymer. Formulations F6, F13 and F20 showed promising results as sustained release formulations depending on their median dissolution time (MDT) values; 8.25, 7.97 and 7. 64 respectively.

Microbiological assay was performed to test the efficacy of drug release rate from these formulations on the inhibition of clinical Staphylococcus aureus (SA) isolates. F6 started to kill methicillin sensitive SA (MSSA 18) after 2 hours of incubation but it needed 4 hours to reach the same effect for two methicillin resistant SA (MRSA 11 and 29) strains. On the other hand, the inhibitory effect appeared within 6-8 hours in case of F13 and F20 against all strains tested. F13 showed much higher biocidal effect after 24 hours of incubation than the other two formulas since it exceeded F6 in log microbial reduction by 1.74, 0.65 and 2.4 CFU/mL for MSSA18, MRSA11 and MRSA29, respectively, while it was 1, 2.57 and 1.57 for MSSA18, MRSA11 and MRSA29, respectively, for F20. The prepared colon targeted vancomycin HCl tablets displayed a promising sustained release *in-vitro*. Microbiological studies confirmed their inhibitory action on the isolates tested.

Biography

Professor Kadria received her Ph.D in Industrial Pharmacy from the University of Alexandria, Egypt. She has over 25 years of experience in the field of pharmaceutical technology during which she published 49 manuscripts in peer reviewed journals concerning microparticles, nanoparticles, colon drug targeting, and in-vivo evaluation of dosage forms. She focused in oral formulation development and Novel drug delivery technologies. Since 2010, she is a professor of pharmaceutics at King Saud University, Saudi Arabia, and currently a reviewer in many international journals.

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