Review Article

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Screening for Antinociceptive Action of Gastroretentive Drug delivery System of Tramadol hydrochloride in Mice

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Abstract

The floating drug delivery system is to avoid the problem of drug waste and to limit the frequency of administration. Here the drug Tramadol is being centrally acting opioid analgesic can be formulated as sustained release formulation by adopting the method gastroretentive drug delivery system through effervescent floating drug delivery system with different grades of polymer Hyperomellose. The Pharmacological activity on Mice by both Hot Plate and Tail Flick Methods also suggest that when the Tramadol Hcl increased with its dosage form shows significant Analgesic Activity in animals which shows a spontaneous dose dependent increase in Analgesic activity was found it shows that the dosage form deserve for designed method of gastroretentive drug delivery system.

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INTRODUCTION

Tramadol is a synthetic opioid Anlgesic Wideley used in the Treatment of moderate to severe pain (Lewis and Han 1997) It exhibits good Analgesic efficacy and its comparable to Morphine in the Treatment of postoperative pain.

Neuropathic pain refers to abnormal pain syndromes producing a seriously debilitating state and affecting millions of people (ossipov et.al 1997) various drug groups including

opioids, Anticonvulsants antidepressants and Topical agents are recommended for some use in the relief of Neuropathic pain.

This work confirms that the dosage forms seems to have better retentive in upper gastric region and it reveals that Analgesic Action also gives for the extended period of time the than single gastric emptying.

Aims and Objectives

The floating drug delivery system is to avoid the problem of drug waste and to limit the frequency of administration. Here the drug Tramadol is being centrally acting opioid analgesic can be formulated as sustained release formulation by adopting the method gastroretentive drug delivery system through effervescent floating drug delivery system with different grades of polymer Hyperomellose included with different concentration of super disintegrant with optimum concentration of gas generating agent sodium bi-carbonate for the tolerance of physiological system with feasible industrial outcome of the product and studies for its Antinociceptic Activity in animals to assure its gastroretentive nature to be undertaken.

Materials and Methods:

Tramadol Hcl, from shashan pharmaceutics, HPMC K4M, HPMC K15M, HPMC K100M. Other chemicals were obtained from Dr. Reddy's laboratory Hyderabed all the chemicals were subjected for screening for its geniuneness

Tramadol Hcl floating tablets were prepared in different concentration of Excipients with 100mg in drug in all formulations, the Tablets were prepared by wet granulation techniques Isopropyl alcohol is used as granulating agent sodium bi carbonate used as gas generating agents. the system falls under the category of effervescent of floating tablets.

The granules were dried at 45-55^{o} C Then the tables were ejected from rotary tablet punching machine.

The tablets from optimized formulations Among 27 the 25th batch is taken and subjected for release kinetics studies the results were interpreted and it is fitted with kinetic equations it follows zero order and peppas release.

Results and Discussion:

Tramadol Hcl Floating tablet containing tramadol Hcl were prepared by wet granulation method and prepared tablet were randomly subjected for invitro release studies the results were interpreted for its kinetic pattern and compared with existing formulations. The results of these studies indicates that when bypromellose mixed with croscarmellose sodium which increase the gastric residence time is more, it is due to hydrophilic nature of HPMC which trap water and it increase in size and become gel. When the gel combined with carmellose sodium it retards the release of tramadol Hcl being this formulations with effervescent nature and adhering property it slowly release the medicament from the dosage form thus increases the gastric residence time and the pharmacological activity on Mice by both Hot Plate and Tail Flick Methods also suggest that when the Tramadol Hcl increased with its dosage form shows significant Analgesic Activity in animals which shows a spontaneous dose dependent increase in Analgesic activity was found it shows that the dosage form deserve for designed method of gastroretentive drug delivery system.

Conclusion:

The result of these studies indicates that when hypromellose mixed with croscarmellose sodium which increase the gastric residence time is more, it is due to hydrophilic nature of

HPMC which trap water and it increase in size and become gel. When the gel combined with carmellose sodium it retard the release of tramodal Hcl being this formulation with effervescent nature and adhering property it slowly release the medicament from the dosage form. Floating drug delivery design with Tramadol hydrochloride with the varying grades of hypermellose and it is subjected for various studies as per literature like FTIR and other Pre-compression and post compression studies. It reveals that with hypermellose K100 M with super disintegrant cross-carmellose sodium shows extended gastric residence time, The analgesic studies by two method and measured Data's were analysed by 2 way Anova it gives significant increased Analgesic Activity. The dosage form of Gastroretentive dry delivery system ensures its retention both by Invitro release profile and Invivo Antinociceptive action.

Ethical Approval

No ethical approval was necessary for this study.

Author Contribution

All authors made substantial contributions to the conception, design, acquisition, analysis, or interpretation of data for the work. They were involved in drafting the manuscript or revising it critically for important intellectual content. All authors gave final approval of the version to be published and agreed to be accountable for all aspects of the work, ensuring its accuracy and integrity.

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