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Review Article

Sustained Release Pre-Filled Syringe and Their Role in Advancing Antiemetic Therapeutic

Pramod Kumar*, Amit Kumar

Roorkee College of Pharmacy, Haridwar, Uttarakhand 247668

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ABSTRACT

Pre-filled syringes are most effective method for the delivery of injectable medications. They capable to deliver a small quantity of medicine. Advantage of pre-Filled syringe over other injectable form is that they can deliver a medicine even in small amount. Ondansetron belongs to a category of antiemetic medicines. This helps to prevent nausea and vomiting. Antiemetic is drives from two words i.e. anti means against and emesis means vomiting. Nausea and vomiting is most common illness among the people worldwide. So antiemetic medicines is categories as most demanding medicines worldwide Ondansetron is most popular antiemetic medicine .it is available in oral dosage form i.e. tablet, liquid and injection form. Among available dosage form injection is most effective dosage from which is used to treat chronic patient for which oral dosage form is not effective. Sustain release dosages form is a most effective in case of patient which want to avoid frequent dosing of the medicines. The purpose of the review article of prefilled syringe is to provide information on the method of manufacturing method of filling drug and to provide information about prefilled drug advantage.

INTRODUCTION

In the field of pharmaceutical technology, in recent years there is tremendous progress and innovation with an increasing endeavor to develop Sustained release dosage forms. The Sustained release dosage forms have many advantages in terms of safety and efficacy over immediate release

products frequency of administration of medicine can be reduced, medicine action can be Sustained and the incidence of adverse effects can be decreased. Sustained-release medicine formulations have been used since 1960. These formulations make the medicine available over extended time after injectable administration. The Sustained-release product will optimize

***Corresponding Author:** Pramod Kumar

Address: Roorkee College of Pharmacy, Haridwar, Uttarakhand 247668

Email ✉: prdpharma@gmail.com

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therapeutic effect and safety of a medicine at the same time improving the patient convenience and compliance. By incorporating the dose for frequent administration to once daily or it may be weekly. Those type of formulation, the medicine release is extended. The ideal medicine release system should show a regular medicine release rate and maintain the constant plasma concentration. Sustained release medicines are designed in a manner to release medicines in a prolonged duration inside the body after administration of single dose. During the last two decades there has been remarkable increase in interest in sustained release medicine release system. This has been due to various factor viz. the prohibitive cost of developing new medicine entities, discovery of new polymeric materials suitable for prolonging the medicine release, and the improvement in therapeutic efficiency and safety achieved by these release systems. Now a day the technology of sustained release is also being applied to veterinary products. These systems also provide a slow release of medicine over an extended period of time and also can provide some control, whether this be of a temporal or spatial nature, or both, of medicine release in the body, or in other words, the system is successful at maintaining prolonged medicine levels in the target tissue or cells.

Ondansetron is a widely used medicine worldwide, Ondansetron SR injection would be a milestone in pharmaceutical industry, as it will reduce the dosing frequency to the patient. Prefilled syringe is made of mainly of four components, Glass syringe also know as barrel, Plunger also know as rubber stopper, Plunger rod and Needle.

Glass syringe: glass syringe is made from borosilicate glass, this is type-I glass . This is used

as a syringe barrel. Syringe Barrel Hold rubber stopper and needle.

Plunger: Plungers are, non-fragile in nature with better durability, low weight in nature. Plunger should be free from leachable and extractable.

Plunger rod: Plunger rod are mainly made of High density polyethylene plastic. Plunger rod may also compose of from a ceramic, carbon steel, or stainless steel base material. A coating can be applied depend on application they will be used for or nature of the drug based on stability and leachability study of the plunger.

MEDICINE PROFILE

Ondansetron is most common drug to treat prevent nausea and vomiting caused by cancer chemotherapy, radiation therapy, and surgery. It is in a class of medications called serotonin 5-HT₃ receptor antagonists. It works by inhibit the action of serotonin, a natural substance that may cause nausea and vomiting.

Chemical Structure

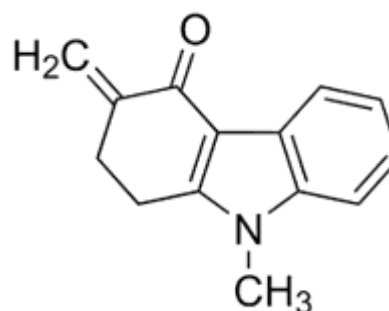


Fig- Ondansetron chemical structure

- **Molecular Formula-** C₁₈H₁₉N₃O,
- **Molecular Weight** - 293.4 g/mol
- **Medicine class-** Antiemetic–Receptor antagonist
- **Routes of administration-** By mouth, rectal, intravenous, intramuscular

Ondansetron is a white or almost white powder in physical appearance. It is partially soluble in water and in alcohol, soluble in methanol. The melting point of Ondansetron is about 173° C. And pH of 1% w/v solution in water is approximately 4.57.

LITERATURE SURVEY

Ondansetron is one of the medications most commonly used for the empiric treatment of nausea and vomiting. Ondansetron has excellent utility as an antiemetic medicine and it is effective against nausea and vomiting of various etiologies. Common uses of Ondansetron include the evidence of chemotherapy-induced and radiation-induced nausea and vomiting, the evidence of postoperative nausea and vomiting, and off-label use for the evidence of nausea and vomiting associated with pregnancy. However, it is not effective for motion sickness-induced nausea. This activity will cover the mechanism of action, pharmacology, adverse event profiles, eligible patient populations, contraindications, and monitoring. It also highlights the interprofessional team's role in managing patients needing. Ondansetron Injection USP should be stored between 15°C – 30°C.

Ondansetron Injection is a sterile solution of Ondansetron Hydrochloride in Water for Injection or of Ondansetron in Water for Injection prepared with the aid of Hydrochloric Acid. It may contain suitable buffers and/or tonicity adjusting agents/wetting agent/viscosity importer. It contains an amount of Ondansetron Hydrochloride equivalent to not less than 95.0 percent and not more than 105.0 percent of the labeled amount of Ondansetron (C₁₈H₁₉N₃O).

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