

Spansules: A Novel Approach

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Abstract

Spansules is considered to be the most advanced form of the capsules that are formulated to deliver the multi drugs at one time at specific time and at both temporal as well as the spatial organs of the body which means the drugs reaches at specific tissue regions as well as the specific tissues .These are considered to be the most advanced forms of the time -prolongs drugs delivery system in the forms of the capsules as these are the novel formulation which works on the zero -order kinetics and hence are often considered as the controlled -release drugs delivery systems. These are often consider as the most innovative forms of the drugs delivery systems that allows the drugs to be converted from its crude forms to suitable forms such that it can shows it's therapeutics effects as seen in the case of belladonna alkaloids atropine when deliver in the form of the parenteral forms its effects last for an hour but when administered in the form of the spansules its therapeutics effects last for about 10-12 hours so there are many advancement made in the pharmaceutical to formulate or rediscover the drugs in the form of the spansules in order to prolong the times of release of drug inside the body. These was also often seen that the manufacturing procedures of the spansules are also considered to be the easier ways of formulation as comparison to the other conventional dosages forms.

Keywords: Controlled release, Novel Drug Delivery System, Capsules, Granules formation, Spansules.

1. HISTORY

By past few years it was seen to be ever challenging task for the emerging pharmaceutical company to develop the new ideas for the formulation of such types of drugs which can uphold the multi drug as well as also have the potency for sustained release of the drugs so that it could maintain the level of drugs in the plasma for prolonged duration of actions [1]. So over the long time of hard work by the emerging scientist in the fields of the pharmaceutical it is made possible for diffusion of the coated drugs which have the only possible for the delayed release of the drugs in the body and also have the better possibility of the permanent release of the drugs inside the body in order to maintain the constant concentration of the drugs in the plasma of the body [2]. It was seen that the delayed result of the drugs can better be obtained from the capsules specially when it incorporates the specially designed granules which are formed by special coating of the different polymers or any delayed material in definite proportions and thus shows the better results than conventional dosage forms like tablets and thus named as the spansules [3]. So it is still the challenging task emerging pharmacist in order to have better pharmacokinetic researches to formulate such types of the medicine that have the ability of targeting the specific organs and produce the sustained effects of the drugs [4].

2. INTRODUCTIONS

Spansules is considered to be the most advanced techniques of the microencapsulation based formulation which have the ability of the upholding the multi drug under the one capsules and produces the therapeutic effects according to the differently release of the polymers inside the body [5]. As it is based on novel

approach of formulations of the capsules i.e. the microencapsulation's which is consider to be the most innovative approach of encapsulating the drugs after the coating of the small granules in to specially designed shell which have the better capability of the dissolving inside the body under the suitable environment of body [6]. The introduction of the advanced forms of the drugs delivery systems which is termed as the Modified form of the drugs delivery systems came in to existence in the year 1952 by the Smith Kline in the laboratories by the French and which formulates novel ways for drug delivery systems and named as "Spansules" [7]. Due to it wide advantages in the field of the pharmaceutical it is proved to be very effective in delivery the drugs to the paediatric patients and many beneficiary effects were also seen with those types of the drugs which have better efficacy when it is chemically synthesised then its crude forms to provide the better ways of administering these types of the drugs spansules were proved to be the best ways for presenting as seen in the case of the belladonna alkaloids, many such antihypertensive drugs [8], antitussive drugs which when administer in the forms of the spansules it shows the better effects then its conventional forms [9]. So spansules can be defined as those forms of the capsules which incorporates the multigranular of different coating materials which have the ability of decreasing the dissolving rates and increasing the release of the drugs for the prolong periods of time as per the coating of the granules [10]. As the word itself suggest those capsules which are specially designed to prolong the medication therapeutics effects for the different times intervals [11].

3. MECHANISM OF ACTIONS

Spansules is consider to be the most advanced form of the capsules as its delivery of the drugs depends upon the coating of the granules as larger the coating of the granules later the drugs release on the other hand the lesser the coating of the granule faster the drugs release as this is considers to be the best ways of delivering the multi drugs compositions medicine at one time at different sites of the actions (as shown in fig 1) [12].

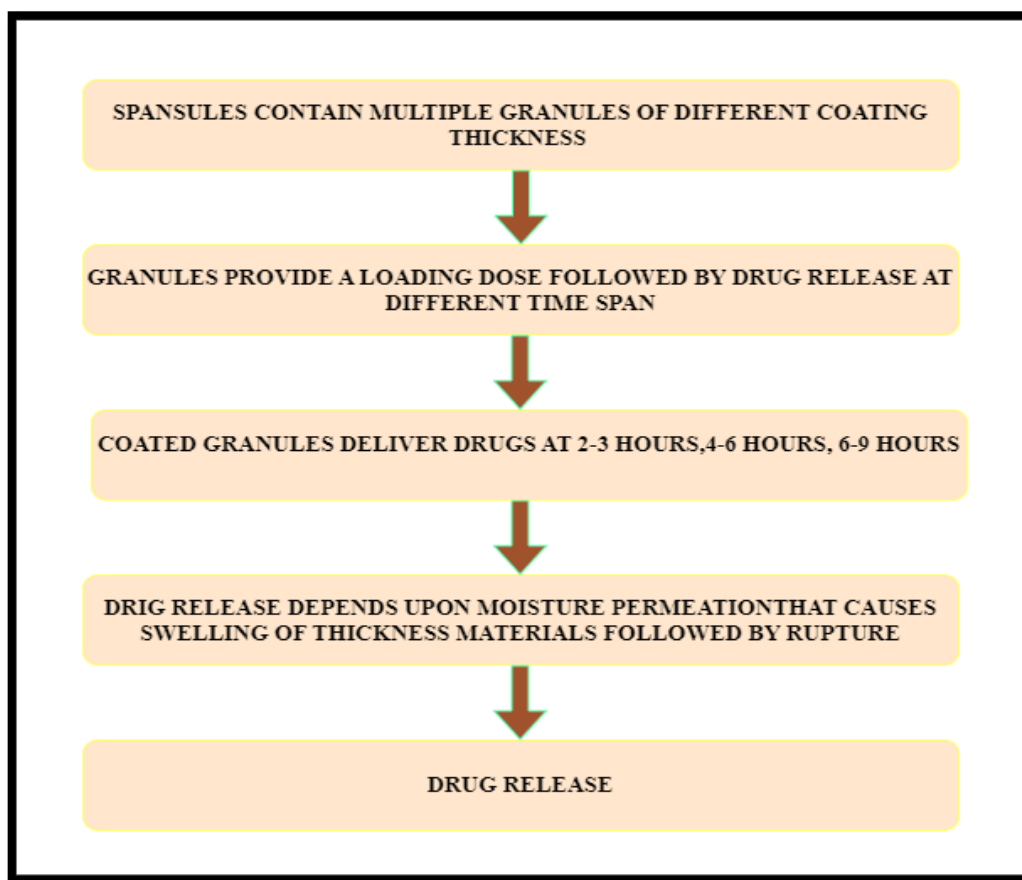


Fig 1: Mechanism of Action of spansules

4. METHODOLOGY

There are vast number of different unique form of the technique that are used for the formulations of the granules that could give the better and effective therapeutic effects as comparison to conventional dosages form these are shown below [13].

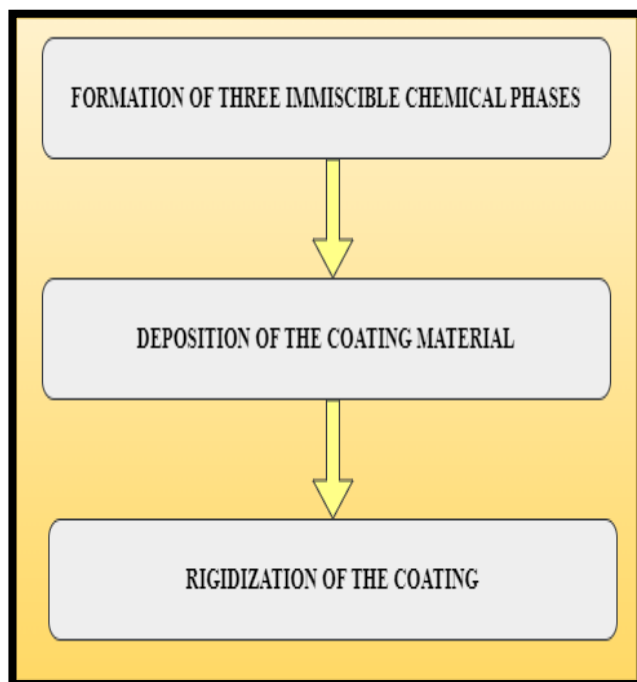


Fig 2: Coaservation-phase Separation.

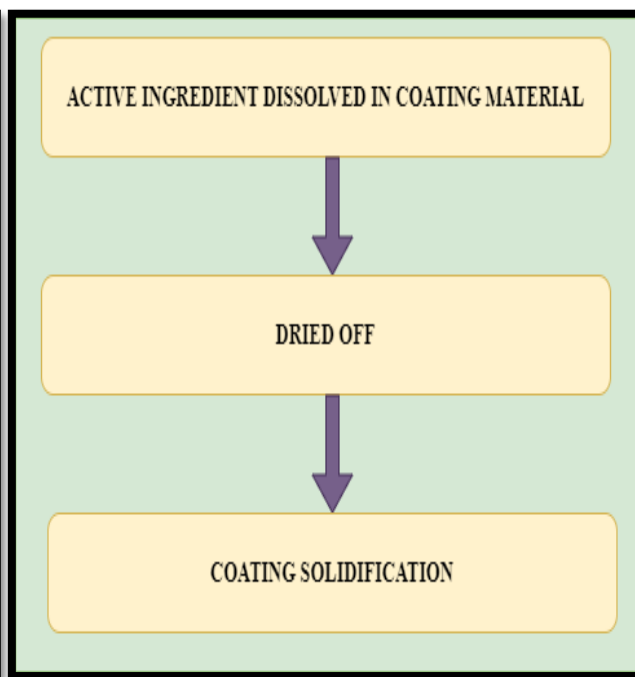


Fig 3: Spray drying

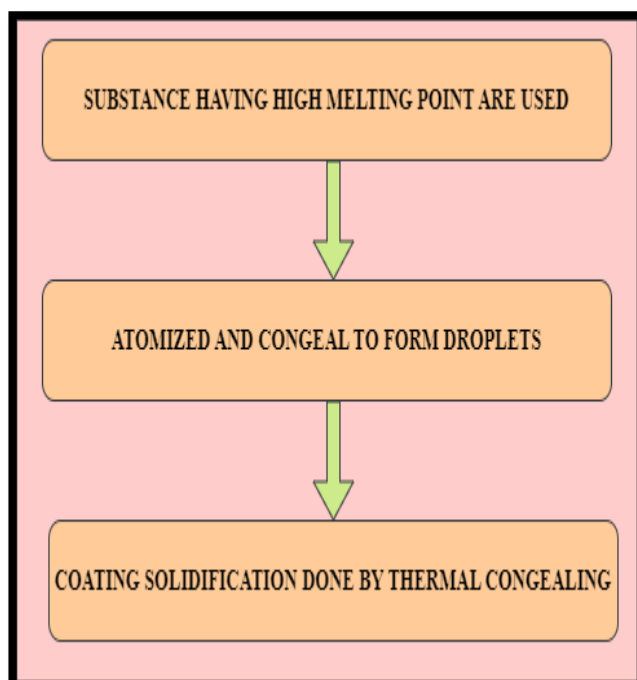


Fig 4: Spray congealing

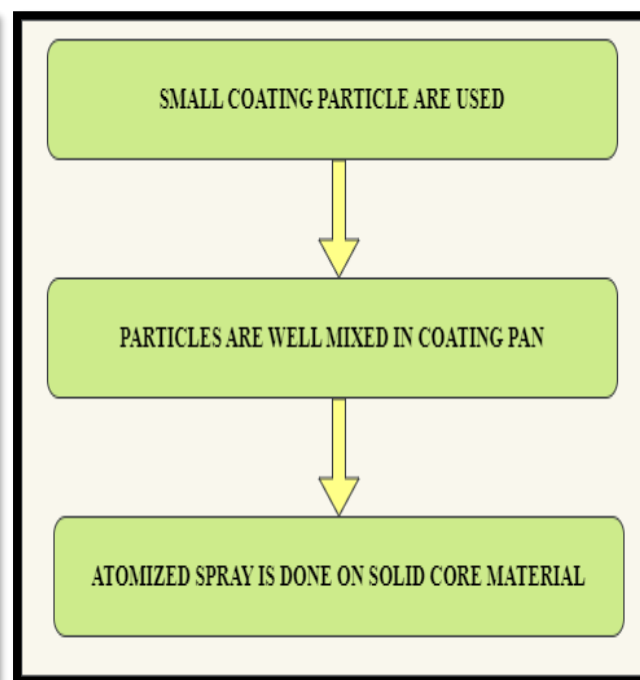


Fig 5: Pan coating

5. FORMULATION

S.No.	Formulation	Milestones	Formulation advancement	Reference
1.	Belladonna alkaloids	when the atropine in combination with mucic acid is subcutaneously administered in the forms of injections it's therapeutic effects was last only within an hour.	This problem is resolve by administering the belladonna through oral route in the form of spansules that contain: Atropine sulfate (0.12 mg), Scopolamine hydrobromide (0.07 mg) and l-hyoscyamine sulfate (0.61 mg) it was seen that it shows the prolonged therapeutic effects which last for approximately 10-12 hours.	[14]
2.	Dexedrine	The conventional type of dosage forms like tablet the maximal dextroamphetamine plasma concentration (Cmax) by administering the three times of 5 mg tablets was found to be 36.6ng/ml which last only for approximately 3hours.	This problem is resolve by introducing the Dexedrine spansules it was seen that by administering the only one 15mg capsules the maximal dextroamphetamine plasma concentration (Cmax) was found to be 23.5ng/ml which last for approximately 8hours.	[15]
3.	Nifedipine	These are practically insoluble in water and light-sensitive drugs used in angina pectoris and hypertension. As its biological half-life is only about 2 Hours and it eliminates rapidly.So repeated daily administration is needed in order to maintain effective plasma levels.	This innovation it was found that extended timed-release of nifedipine is increased over a period of 8 hr.	[16]

6. PROS AND CONS OF SPANSULES

There are certain pros and cons by the use of spansules these are listed below [17].

S.No.	Pros	Cons
1.	It is able to produce dual effects like controlled as well as sustained release depending upon the prescription either single or multiple	It was also seen that dumping of more dose in one may produce side effects.
2.	It could be able to reduce the dosing frequency.	It was often seen that these have lack of in vitro-in vivo correlation.
3.	It produces increment in producing the safety margin for the high potent drugs.	It may produce toxicity due to prolong actions of drugs
4.	It allows the taste masking of powder.	Due to it prolong systemic availability it may decrease as compared to immediate release by conventional capsules.
5.	It possess the increment in stability of drug from the degradation in the GI tract.	It is complex in formulation, skilled labour is required.

Future scope

The introduction of the spansules in the field of the pharmaceutical formulations has proves to be the most innovative ways of the drug delivery system as it seems to helpful in providing the multiple effects of the drug by administering the one drug in to the suitable medicine [18]. This formulation not only helpful in the enhancing the potency of the drugs but also it is able to transforms all those drugs that are not administer in its crude forms and also provide the best ways of delivery the drugs to paediatric patients [19]. So spansules is considered to be the best choice for formulating those drugs that can produces the site -specific drugs delivery systems [20].

7. CONCLUSION

These novel formulations of the drugs are considered to be the most innovative way for the packing the drugs specially the active ingredients for the drugs that have the potential for producing the vast multiple effects by administering the single dose in the forms of spansules. This formulation not only allows the manufacturers to incorporate the multiple drugs in one shell but also it allows the drugs to be protective from the external environments in order to have better therapeutic effects. These drugs have wide advantage in various field of the medication like the introduction of the atropine in the forms of spansules, The introductions of the Dexedrine in the form of the spansules, the introduction of novel medicine by the GSK pharm named as the "SKF TUSS-ORNADE spansules" that are helpful in providing the better effects as the anti-tussive agents and many associated enhancement like nifedipine which give the prolong effects of about 8 hrs in treatment of angina as well as hypertension as comparison to its previous conventional forms. So the spansules are helpful in effectively delivery the numerous forms of the medication for a prolonged time intervals.

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