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Immediate Release Tablet Dosage Form: A Review

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INTRODUCTION:-

Immediate release drug delivery system is also conventional type of drug delivery system because it is outlined as immediate release tablets are prepared to disintegrate and release their medicaments with no special rate controlling features such as special coatings and alternative techniques. The Oral route is one of the most preferredroute for the systemic impact due to its ease of ingestion, simple, safest, convenient, non-invasive, versatility and most significantly, patient compliance. Solid oral delivery systems are low cost manufactured because they don't need sterile conditions. Although, increased focus and interest within the space of controlled release and targeted drug delivery system in recent years, solid dosage forms that are intended to be swallowed whole, disintegrate, and release their medicaments quick and furiously within the gastrointestinal tract. An ideal dosage regimen of drug therapy is the one, which immediately nab the desired therapeutic concentration of drug in plasma (or at the site of action) and maintains it constantly for the entire duration treatment. Therefore, the scientists have focused their attention on the formulation immediately released tablet.

DEFINITION :-

Immediate release tablets are those which disintegrate rapidly and get dissolved to release the medicaments. Immediate release may be provided for by way of an appropriate pharmaceutically acceptable diluent or carrier, which diluent or carrier does not prolong, to an appreciable extent, the rate of drug release and/or absorption. This termexcludes formulations which are adapted to provide for "modified", "controlled", "sustained", "prolonged", "extended" or "delayed" release of drug.

MECHANISM OF ACTION:-

Water wicking, swelling and possibly some deformation recovery. Rapidly disperses and swells in water, but does not gel even after prolonged exposure. Greatest rate of swelling compared to other disintegrants. Greater surface area to volume ratio than other disintegrants. Low-substituted hydroxyl propyl cellulose Which is insoluble in water. Rapidly swells in water. Grades LH-11 and LH-21 exhibit the greatest degree of swelling.

IDEAL PROPERTIES:-

Ideal Properties Immediate release dosage form should,

1. It should dissolve or disintegrate in the stomach within a short period In the case of solid dosage.
2. Should show first absorption and dissolution of drug.
3. Rapid onset of action always seen with immediate release tablets.
4. Must be compatible with taste masking.
5. Be portable without fragility concern.
6. It should not leave minimal or no residue in the mouth after oral administration.
7. Provides pleasing mouth feel.
8. Exhibit low sensitivity to environmental condition as humidity and temperature.
9. Be manufactured using conventional processing and packaging equipment at low cost

DISADVANTAGE

1. Frequent dosing is necessary for drug with short half life.
2. Drug release at a time may produce high plasma concentration which may produce toxicity

CANDIDATE FOR IMMEDIATE RELEASE

Oral Dosage Form :-
Analgesics and Anti-inflammatory Agents: egAloxiprin, auranofin,azapropazone, benorylate, diflunisal, etodolac
.
Anthelmintics :
Albendazole , bephenium, hydroxynaphthoate , cambendazole, dichlorophen,ivermectin, mebendazole,

Anti-Arrhythmic Agents:
Amiodarone HCl, Disopyramide, flecainide acetate,quinidine sulphate.

Anti-bacterial Agents:
Benethamine penicillin, cinoxacin,ciprofloxacin HCl, clarithromycin,clofazimine, cloxacillin, demeclocycline, doxycycline,erythromycin, ethionamide,

Anti-coagulants:
Dicoumarol,dipyridamole, nicoumalone, phenindione.

Anti-depressants:
Amoxapine, ciclazindol, maprotiline HCl, mianserin HCl, nortriptyline HCl, trazodone HCl, trimipramine maleate.

Anti-diabetics
Acetohexamide,chlorpropamide, glibenclamide,gliclazide, glipizide, tolazamide, tolbutamide.

Anti-epileptics:
Beclamide,carbamazepine,clonazepam,ethotoin, methoin, methsuximide, methylphenobarbitone, oxcarbazepine,paramethadione,phenacemide,phenoba

Anti-gout Agents:
Allopurinol,probenecid, sulphinpyrazone.

EXCIPIENTS:

Excipients balance the properties of the actives in Immediate release dosage forms. This demands a thorough understanding of the chemistry of these excipients to prevent interaction with the actives.
Determining the cost of these ingredients is another issue that needs to be addressed by formulators. The
role of excipients is important in the formulation of fast-melting tablets. These inactive food-grade ingredients, when incorporated in the formulation, impart the desired organoleptic properties and product efficacy. Excipients are general and can be used for a broad range of actives, except some actives
that require masking agents.

BULKING AGENTS

Bulking agents are significant in the formulation of fast-melting tablets. The material contributes functions of a diluents, filler and cost reducer. Bulking agents improve the textural characteristics that in turn enhance the disintegration in the mouth, besides; adding bulkalsoreduces the concentration of the active in the composition. The recommended bulking agents for this delivery system should be more sugar-based such as mannitol, polydextrose, lactitol, DCL (direct compressible lactose) and starch hydrolystate for higher aqueous solubility and good sensory perception. Mannitol in particular has high aqueous solubility and good sensory perception. Bulking agents are added in the range of 10 percent to about 90 percent by weight of the final composition .

LUBRICANTS

Lubricants, though not essential excipients, can further assist in making these tablets more palatable after they disintegrate in the mouth. Lubricants remove grittiness and assist in the drug transport mechanism from the mouth down into the stomach.

SUPER DISINTEGRANTS

A disintegrant is an excipient, which is added to a tablet or capsule blend to aid in the breakup of the compacted mass when it is put into a fluid environment.

METHOD OF FORMULATION

[a] Direct compression
[b] Wet granulation

[a] Direct Compression Method
In this method, tablets are compressed directly from the mixture of the drug and excipients without any preliminary treatment. The mixture to be compressed must have adequate flow properties and cohere under pressure thus making pretreatment as wet granulation unnecessary. Few drugs can be directly compressed into tablets of acceptable quality. A type of disintegrant and its proportion are of prime importance. The other factors to

be considered are particle size distribution, contact angle, pore size distribution, tablet hardness and water absorption capacity. All these factors determine the disintegration. The disintegrant addition technology is cost effective and easy to implement at industrial level.

[b] Wet Granulation method :-
Wet granulation is a process of using a liquid binder to lightly agglomerate the powder mixture. The amount of liquid has to be properly controlled, as over-wetting will cause the granules to be too hard and under-wetting will cause them to be too soft and
friable. Aqueous solutions have the advantage of being safer to deal with than solvent-based systems but may not be suitable for drugs which are degraded by hydrolysis.

PROCEDUREFOR PREPERATION

Step 1: The active ingredient and excipients are weighed and mixed.
Step 2: The wet granulate is prepared by adding the liquid binder–adhesive to the powder blend and mixing thoroughly. Examples of binders/adhesives :- include aqueous preparations of cornstarch, natural gums such as acacia, cellulose derivatives such as methyl cellulose, gelatin, and povidone.
Step 3: Screening the damp mass through a mesh to form pellets or granules.
Step 4: Drying the granulation.
Step 5:After the granules are dried, they are passed through a screen of smaller size than the one used for the wet mass to create granules of uniform size.

EVALUATIONPARAMETERS:-

These tests are as following:-

1. Appearance:-
   . Appearance is including elegance, shape, color, surface textures. These all parameters are essential for suitability and consumer acceptance

2. Thickness:-
   Dimensional Analysis Thickness and diameter of tablets are determined using Vernier Caliper. Randomly twenty tablets selecte from each batch are use and average values are calculated. Thickness is expressed in Mean ±SD and unit is mm
3. Hardness :-
   Hardness Hardness of tablet is an indication of its strength against resistance of tablets to capping, abrasion or breakage under conditions of storage, transportation and handling before usage. Hardness is measuring the force required to break the tablet using a specific device. Hardness of 10 tablets (randomly) from a complete batch are determined by Different hardness tester (Monsanto hardness tester, Pfizer hardness tester). Hardness measured in kg/cm2

4. Weight variation :-
   Weight variation test Weight variation test is carried out in order to ensure uniformity in the weight of tablets in a batch. Individual weights of 20 tablets are taken randomly from whole batch. Individual weight is then compared with the average weight for the weight variations.

5. Friability:-
   Friability test Tablet friability test is determined for compressed uncoated tablets with friabilator. Measurement of tablets friability supplements other physical strength measurement, such as tablet crushing strength. For tablets with a unit mass equal to or less than 650mg take a sample of whole tablets n corresponding as near as possible to 6.5 g. For tablets with a unit mass of more than 650 mg, take a sample of 10 whole tablets.

. CONCLUSION:-

Most of the patients needs a rapid therapeutic action of drug , these dosage form which gives a rapid on set of action. These immediate release tablet having good patient compliance, and having much more advantages over another dosage form. In these review work was done with an aim to design an immediate release oral dosage forms and evaluation of the tablets, excipients used for immediate release tablets, mechanism of action and also various parameters including in vitro drug dissolution studies. The powdered blend were compressed into tablets and were analyzed for the parameters such as average weight, disintegration time, friability, thickness, weight variation, hardness

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