ABSTRACTS

Medicine can take into your body by various ways. You can swallow a tablets, drink a liquid form of medicine, or by parenteral. Suppository are the dosage form inserted into body cavity, mainly rectum and vagina to deliver the drug into the systemic circulation. Suppositories can be taken by patients which unable to take medicine orally due to nausea and vomiting, and neurological disorder. Suppositories are used over other dosage form because some medicines have too bad taste and difficulty in swelling. This paper represents different technique of manufacturing of rectal, vaginal and urethral suppositories and used to treat several conditions of patients.

KEYWORDS:- Suppository, rectal, urethral, vaginal, suppository base, displacement value.

INTRODUCTION

Suppository are the form of medicine contained small piece of solid substance like cocoa butter or glycerine, that melts at body temperature. It is small, round or cone in shape. Suppositories are enter the body cavity through the rectum, vagina or urethra. Rectal suppositories are mostly used for treatment of disease.
Use of suppositories\textsuperscript{[2]}

- Use suppositories when the patients are unable to take drugs orally.
- Suppositories are used to treat local area, or the medicine may travel to other parts of the body through the bloodstream.

Why uses suppositories\textsuperscript{[2]}

Suppositories used by patients in difference condition if they

- Are having seizures and can not take medicine by mouth.
- Patients are unable to swallow medication for any reason.
- Patients are vomiting and can not keep tablets or liquids dose. Patients may also take suppositories if the medication
- Tastes of medicine too bad to take by mouth.
- Would break down too quickly in the gut.

Advantage and disadvantage of suppositories\textsuperscript{[3,4]}

Advantage

- Over oral drug administration
  - First pass metabolism avoided.
  - Introduce directly drugs into the body by bloodstream.
  - It can be administered to unconscious patients.
  - Used before surgery if oral route of medicine is restricted.
  - Very useful in vaginal infections.
  - Get direct site of action with lower dose.
  - Can be used directly targeted drug delivery.
- Over parenteral drug administration
  - Medication administered to itself.
  - Does not give any systemic side effects.
  - Does not pain which associated with parenteral medication.
- For use over vaginal tablets
  - Suppositories dissolve very quickly.
  - No itching.
  - No residue remains as in tablets dosage form.
Disadvantage

- Some patients do not like or not feel good from suppositories.
- Suppositories required low temperature or freeze for storage.
- Medication effects can be affected by diarrhea as well as other disease.
- Some older patients and pediatric patients have difficulty in self-medication.

Types of suppositories and their use\[5,6,7\]

There are three types of suppositories on the basis site of uses.

1. **Rectal suppositories**: Solid forms of medication that are inserted into the rectum or anus. They are typically an inch long and have a rounded tip. Medications from the rectal suppositories are work quickly because suppositories melt inside the body and are absorbed directly into the bloodstream.

These are used to treat different conditions such as

- Constipation
- Fever
- Hemorrhoids
- Mental health issues such as anxiety
- Nausea and vomiting
- Pain and itching
- Allergy
- Motion sickness

2. **Vaginal suppositories**: Vaginal suppositories are solid medication that are inserted into vagina with a device or an applicator. These are mainly oval in shape and used to treat for different disorder-

   a. Bacterial or fungal infections.
   
   b. Vaginal dryness.
   
   c. Birth control.

3. **Urethral suppositories**: Urethral suppositories are used for treatment mainly erectile dysfunction. It is rarely used. Alprostadil are available in market to treat erection problem for men.
4. **Method of preparation**[^8] – There are various methods used to prepare suppositories.

5. **Hand rolling methods or hand mold method** – This method includes combining the drug with suppository bases and then rotating by hand to prepare the suppositories' shape. It is however very difficult and takes more time for preparing which built it not frequently used.

6. **Compression mold method (Cold compression method)**[^9] – Suppositories are normally manufactured by using the cold compression method. Heating is not needed in this method, which assemble to manufacturing for both thermolabile and insoluble drugs. Suppositories are manufactured by mixing constituent with a base. A group of bases (glycerol gelatin base) in which compression method are used for making the suppositories.

7. **Fusion or melt mold method** - This is manufacture by heating the mold. Distribution of the into the suppository base is the approach used in this method. Fusion molding require first melting the suppository base and then dissolving the drug in the melted base.

8. **Automatic mold method** - It is the fastest method of manufacturing of suppositories. The whole process is fully automatic, 5000 – 10000 pills suppositories are prepared per hours.

9. **Suppository bases**:[^10,11] It should be non-irritating, non-toxic, inactive and harmony with the active ingredients, and easily prepared by molding or compression method. Suppositories base have superior role in both the rate and extent of release of drug. Suppository base are classify mainly two types on the basis of form and physical properties.
   a. **Oleaginous (Fatty or hydrophobic) bases** - Which is melted at body temperature. Example- cocoa butter, hard fats.
   b. **Water soluble (Water miscible) bases** - Which dissolved in rectal fluid to release the drug (eg. Gelatin, polyethylene glycol). These formulations do not require to melt at body temperature, so water soluble suppositories can be prepared. Glycerinated gelatin is mainly used for vaginal suppositories.
   c. **Displacement value of suppository**[^8] - The quantity of the drug which displaces one part of the base is known as displacement value. Or Displacement value can be defined...
as the amount of drug that displace 1 gm. of suppository base.

**Evaluation tests for suppositories**\(^{[8,12]}\)

1. **Test of appearance**: All the suppositories are should be uniform in size, shape and elegant appearance.

2. **Breakage test (Test of physical strength)**: The tensile strength of suppositories is measured. Testing is done by using an apparatus called a breakage test apparatus. There are two walls in this apparatus. The water pumps through the its walls suppositories are placed inside a disc in the chamber. It is connected by a rod. The other end of the rod consists of another disc on which weight is placed.

3. **Test of dissolution rate**: It is used for calculating the amount of dosage form that is dissolved in body fluid in unit time. It is measure rate at which drug release from the suppositories. Two types of apparatus are used to measure dissolution rate.

   (a) **Suppository dialysis cell**: It is used for lipophilic suppositories which is also known as modified flow through cell.

   (b) **Stationary basket**: Hydrophilic suppositories are tested using stationary basket.

4. **Test of melting range**:\(^{[13]}\) Micro melting range and macro melting range are determined as follows,

   (a) **Macro melting range**: It is used to measure thermal stability of suppositories. It is time taken process by the whole suppository to melt in a constant temperature. A tablet disintegration apparatus are used for the test. The suppository is dip in a constant water bath and then melting range is recorded.

   (b) **Micro melting range**: Capillary tubes are used to measure micro melting range.

5. **Liquefaction time (Softening)**: The time at which suppository melts whole at a definite temperature. Softening time is show the hardness of the base. Fabricated instrument used to measure liquefaction temperature/time.

**Currently suppository available in market**\(^{[14]}\)

<table>
<thead>
<tr>
<th>Brand/product name</th>
<th>Composition</th>
<th>Strength</th>
<th>Dosage form</th>
<th>Pack size</th>
<th>Therapeutic category</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANOMEX</td>
<td>Hydrocortisone Acetate Lidocaine (with Zinc Oxide and Allantoin)</td>
<td>0.25 %w/w 3.0 %w/w</td>
<td>Suppositories</td>
<td>5</td>
<td>Anti-haemorrh</td>
</tr>
<tr>
<td>ANOMEX DS</td>
<td>Hydrocortisone Acetate</td>
<td>5 mg</td>
<td>Suppositories</td>
<td>5</td>
<td>Anti-haemorrh</td>
</tr>
<tr>
<td>Brand</td>
<td>Description</td>
<td>Quantity</td>
<td>Form</td>
<td>Category</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
<td>----------</td>
<td>------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>COMIT 50</td>
<td>Sildenafil Citrate equivalent to Sildenafil</td>
<td>50 mg</td>
<td>Suppositories</td>
<td>Erectile Dysfunction</td>
<td></td>
</tr>
<tr>
<td>CONLAX 5/10</td>
<td>Bisacodyl BP/USP</td>
<td>5 / 10 mg</td>
<td>Suppositories</td>
<td>Laxative</td>
<td></td>
</tr>
<tr>
<td>G - ALFENAC 100</td>
<td>Aceclofenac BP</td>
<td>100 mg</td>
<td>Suppositories</td>
<td>Pain Relief</td>
<td></td>
</tr>
<tr>
<td>GACET 80/125/170/250/500</td>
<td>Paracetamol BP (Acetaminophen USP)</td>
<td>125/250/500 mg/1 G</td>
<td>Suppositories</td>
<td>Pain Relief</td>
<td></td>
</tr>
<tr>
<td>GMETH - 50/100</td>
<td>Indomethacin BP</td>
<td>50/100 mg</td>
<td>Suppositories</td>
<td>Anti-Inflammatory</td>
<td></td>
</tr>
<tr>
<td>GSUNATE - 50/100/200</td>
<td>Artesunate</td>
<td>50/100/200 mg</td>
<td>Suppositories</td>
<td>Antimalarial</td>
<td></td>
</tr>
<tr>
<td>GV-SOFT</td>
<td>Glycerine USP 1/2/3/4</td>
<td>90% w/w</td>
<td>Suppositories</td>
<td>Laxative</td>
<td></td>
</tr>
<tr>
<td>GVCAM - 7.5/15</td>
<td>Meloxicam BP</td>
<td>7.5/15 mg</td>
<td>Suppositories</td>
<td>Pain Relief</td>
<td></td>
</tr>
<tr>
<td>LOFNAC - 12.5/25/50/100</td>
<td>Diclofenac sodium BP</td>
<td>12.5/25/50/100 mg</td>
<td>Suppositories</td>
<td>Pain Relief</td>
<td></td>
</tr>
<tr>
<td>MEFINOL</td>
<td>Mefanamic acid BP</td>
<td>250 mg</td>
<td>Suppositories</td>
<td>Pain Relief</td>
<td></td>
</tr>
<tr>
<td>MELANEZ</td>
<td>Mesalamine USP</td>
<td>25/100/500 mg</td>
<td>Suppositories</td>
<td>Anti-Inflammatory</td>
<td></td>
</tr>
<tr>
<td>MENINA - 25/100</td>
<td>Dimenhydrinate USP</td>
<td>25/100 mg</td>
<td>Suppositories</td>
<td>Anti-Nausea</td>
<td></td>
</tr>
<tr>
<td>OPRAM - 10/20</td>
<td>Metoclopramide BP</td>
<td>10mg/20mg</td>
<td>Suppositories</td>
<td>Anti-Nausea</td>
<td></td>
</tr>
<tr>
<td>SLIPIZEM - 2.5/5/10</td>
<td>Diazepam BP</td>
<td>2.5/5/10 mg</td>
<td>Suppositories</td>
<td>Anti-Depressant</td>
<td></td>
</tr>
<tr>
<td>TYRIDOL</td>
<td>Tramadol hydrochloride BP</td>
<td>100 mg</td>
<td>Suppositories</td>
<td>Anti-Inflammatory</td>
<td></td>
</tr>
<tr>
<td>VIGOTAMIN</td>
<td>Ergotamine Tartarate Caffeine</td>
<td>2 mg/100 mg</td>
<td>Suppositories</td>
<td>Anti-Migraine</td>
<td></td>
</tr>
<tr>
<td>VOMITIN - 10/30/60</td>
<td>Domperidone BP</td>
<td>10/30/60 mg</td>
<td>Suppositories</td>
<td>Anti-Nausea</td>
<td></td>
</tr>
</tbody>
</table>

**REFERENCES**

2. Medical news today. How do you use a suppository?
4. Pharmaguideline.com/2021/10/Ankur chaudhary /definition, type, advantage and disadvantage of suppositories.
5. www.wikipedia.com suppositories
6. healthline.com/health/general/how to use rectal suppository.
11. www.sciencedirect.co22.11.4 suppository base.