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SUBLINGUAL TABLETS: A REVIEW ON

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ABSTRACT

Oral administration is one of the most convenient forms for the intake of drug due to ease of administration, painless, versatility, and paramount patient compliance. The demand of fast disintegrating tablets has been growing, during the last decades especially for geriatric and pediatric patients due to dysphasia. The demand of fast disintegrating tablets has been growing during the last decade, due to the characteristics of fast disintegrating sublingual tablets for the potential emergency treatment. In terms of permeability, the sublingual area of the oral cavity (i.e, the floor of the mouth) is more permeable than the buccal (cheek) area, which in turn is more permeable than the palatal (roof) of the mouth. Drug delivery through the oral mucous membrane is considered to be a promising alternative to the oral route. These tablets disintegrate and dissolve rapidly in saliva due to interaction with our salivary enzymes.

KEYWORDS: Sublingual drug delivery, Improved bioavailability, Tecnique, Evaluation.

INTRODUCTION

Oral administration is a route of administration where a substance is taken through the mouth. Many medications are taken orally because they are intended to have a systemic effect, reaching different parts of the body via the bloodstream. Tablet is defined as a compressed solid dosage form containing medicaments with or without excipients. According to the Indian Pharmacopoeia Pharmaceutical tablets are solid, flat orbiconvex dishes, unit dosage form, prepared by compressing a drugs or a mixture of drugs, with or without diluents. They vary in shape and differ greatly in size and weight, depending on amount of medicinal

substances and the intended mode of administration. It is the most popular dosage form and 70% of the total medicines are dispensed in the form of Tablet.[1,2]

Drug delivery through the sublingual route had emerged from the desire to provide immediate onset of pharmacological effect. Dysphasia (difficulty in swallowing) is a common problem of all age groups, especially geriatrics, pediatric, and patients who are mentally retarded, uncooperative, nauseated or on reduced liquid intake/diets have difficulties in swallowing these dosage forms[3,4,5] Sublingual means under the tongue. The drug absorbed from stomach goes to mesenteric circulation which connects through portal vein. Thus absorption through oral cavity avoid first pass metabolism. The sublingual tablets are usually small and flat, compressed lightly to keep them soft. The tablets must dissolve quickly allowing the API to be absorbed quickly. ItÊs designed to dissolve in small quantity of saliva; after the tablet is placed in the mouth below the tongue, the patient should avoid eating, drinking, smoking and possibly talking in order to keep the tablet in place. Systemic drug delivery through the sublingual route had emerged from the desire to provide immediate onset of pharmacological action.[6-9]

Sublingual Glands

Another name of sublingual gland is salivary glands which are present in the floor of the mouth, underneath the tongue. Drugs having short delivery and infrequent dosing regimen could be delivered successfully through sublingual route because of high permeability and rich blood supply, the sublingual route produces a rapid onset of action. A good oral hygiene could be promoted with the help of sublingual glands. Sublingual glands are also known for their binding and lubricating functions, and sublingual gland secretion makes the food slippery and easily swallowable. High content of saliva in the masticated food helps the food to move without any difficulty. Saliva secretion plays a major role in shaping the principle physiological environment of oral cavity in terms of pH, fluid volume and composition. Saliva secretion has been promoted by 3 major salivary glands which are parotid, submaxillary, sublingual glands. However minor salivary or buccal glands are also involved in saliva secretions which are situated in or immediately below the mucosa. Saliva regulates oral microbial flora by maintaining the oral pH and enzyme activity. Sublingual glands are known for their viscous saliva with limited enzymatic activity whereas parotid and submaxillary gland produces watery secretion. Saliva helps in lubricating the oral cavity; it facilitates swallowing and prevents demineralization of the teeth. Approximately 0.5-2.0L of

saliva has been secreted by salivary gland. However the volume of saliva which is available constantly is around 1.1ml, thus providing a relatively low fluid volume available for drug release from delivery systems compared to GIT. If we compare the GI fluid and saliva, saliva is relatively less viscous. The flow rate of saliva which depends on 3 factors like the time of day, the type of stimulus and the degree of stimulation.[10]

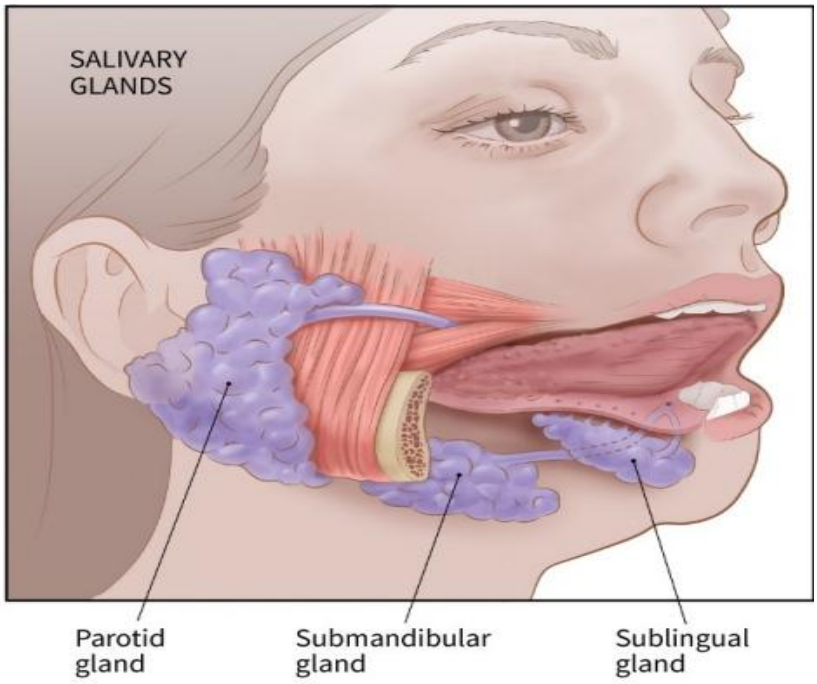


Fig. no.1 Sublingual gland.

Sublingual Drug Delivery[11-14]

Sublingual means under the tongue and refer to the pharmacological route of administration by which drugs diffuse into the blood through tissues under the tongue. Sublingual route offers direct contact of drug with oral mucosa which will leads to come directly in to systemic circulation which leads to enhance bioavaibility of dosage foam. Dysphagia (difficulty in swallowing) which is a common problem of all age groups, children, elderly, uncooperative or on reduced liquid intake have difficulties in swallowing sublingual route is promising approach for overcoming this type of problems after the oral administration of drug the drug goes to hepatic first pass metabolism this will result in to decrease bioavaibility of drug formulation. Sublingual route of drug delivery is promising approach to remove this type of problems.

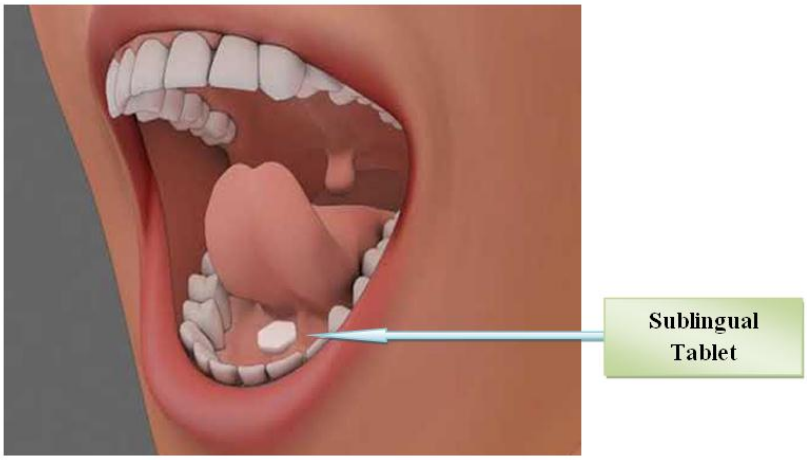


Figure 2: Sublingual drug delivery.

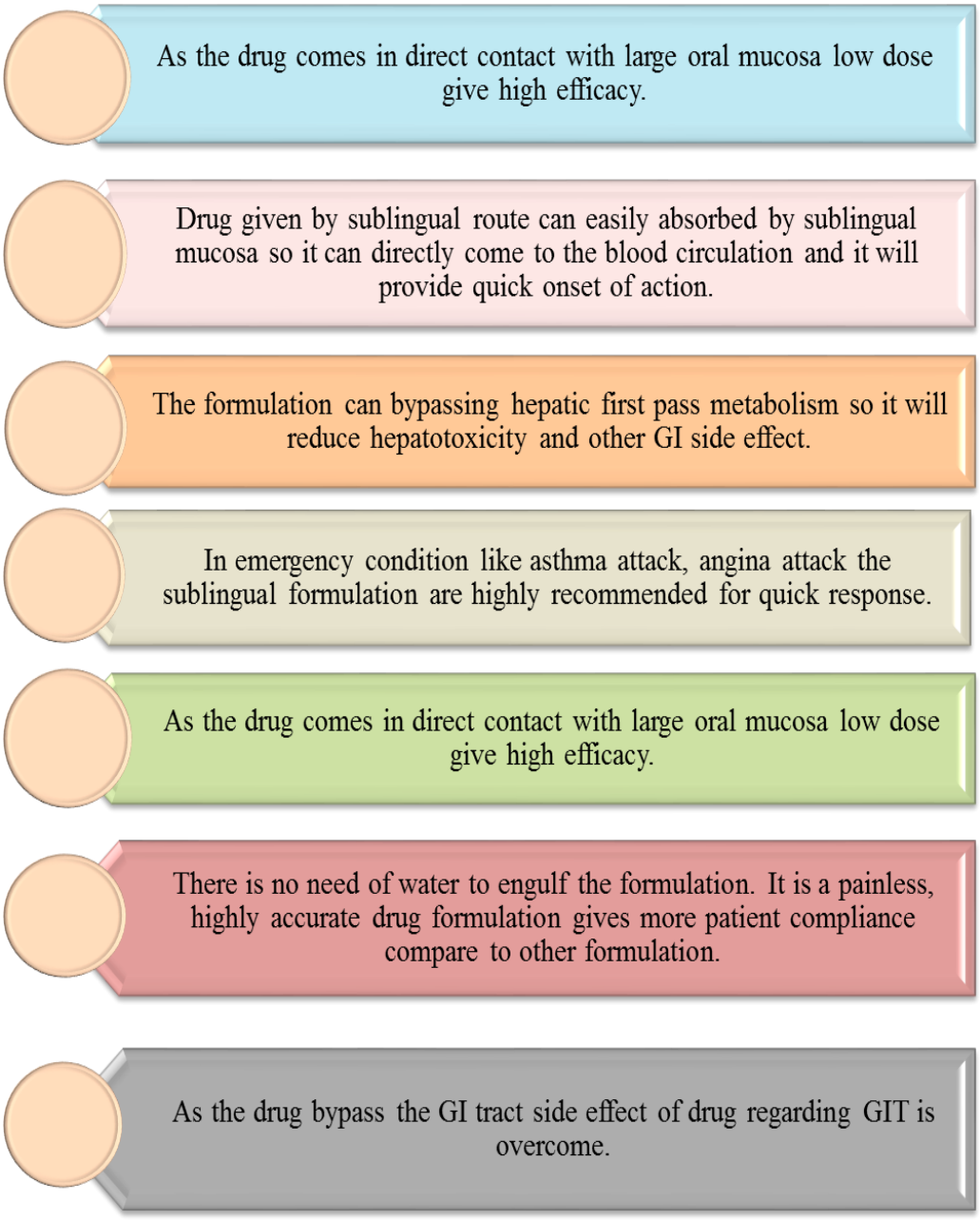
Drugs for Sublingual Administration

Sublingual drug administration is applied in the field of cardiovascular drugs, steroids, some barbiturates and enzymes. It has been a developing field in the administration of many vitamins and minerals which are found to be readily and thoroughly absorbed by this method. Nutrition which are absorbed sublingually avoids exposure to the gastric system and liver, means direct nutritional benefits particularly important for sufferers of gastrointestinal difficulties such as ulcers, hyperactive gut, coeliac disease, those with compromised digestion. Drugs like cardiovascular drugs such as nitrites and nitrates, analgesics such as morphine, antihypertensive such as nifedipine, bronchodilators such as fenoterol could be administered successfully through sublingual route to show their rapid onset of action. Treatment of angina pectoris, hypertension, and antiatherosclerotic activity could be done effectively with the sublingual dosage form because it offers the fast release of drug from the formulation and it reaches the systemic circulation directly which bypasses the first pass metabolism of drugs. Fast disintegrating sublingual tablets could be used for the potential emergency treatment. The demand of fast disintegrating sublingual tablets has been increasing day by day because of the swallowing difficulties of geriatric and pediatric patients. Because of easy administration and better patient compliance, fast disintegrating sublingual formulations has become popular as NDDS (NOVEL DRUG DELIVERY SYSTEM).

Drugs like lisinopril could be delivered through sublingual route for the treatment of hypertension which is caused by obesity, stress, decreased physical activity, increased salt intake, and decreased calcium and potassium intake. Treatment of cardiovascular disease

could be done effectively because it offers faster disintegration of tablet, faster onset of action, and rapid absorption of drug by sublingual mucosa blood vessels. Moreover, drug candidates that undergo pregastric absorption when formulated as ODT may show increased oral bioavailability. Sublingual route is mostly useful for fastest onset of action as in the case of angina pectoris. The use of an ODT formulation of ondansetron has been found to be helpful in the treatment of children as young as 6 months of age suffering from gastroenteritis and dehydration.[15-18]

Advantages[19-21]



Disadvantages[19,22,23]

Mechanism of sublingual absorption

The absorption potential of oral mucosa is influenced by the lipid solubility and therefore the permeability of the solution, ionization potential, ph, molecular weight of the substance. Absorption of some drugs through oral mucosa is shown to increase when carrier ph is increasing (more acidic) and decrease with a lowering ph (more alkaline).Cells of oral epithelium and epidermis are also capable of absorbing by endocytosis (the uptake of particles by a cell as if by wrapping itself around it).These engulfed particles are usually too large to diffuse through its wall. The oral cavity is highly acceptable by the patients; the mucosa is relatively permeable with rich blood supply. It is robust and shows short recovery times after stress or damage and the virtual lack of langerhans cell makes the mucosa tolerant to potential allergens. These factors make the oral mucosal cavity a very attractive and feasible site for systemic drug delivery. Besides the biochemical characteristics of the buccal and sublingual membrane which are responsible for the barrier functions and permeability. Various factors of the drug molecule influence the extent of permeation through the membrane-Lipid solubility, degree of ionization, pka of the drug, ph of the drug solution, presence of saliva, membrane characteristics, molecular weight and size of the drug. Various physicochemical properties of the formulation and the presence or absence of permeation enhancers all affect the absorption and permeation of drugs through oral mucosa. However peroral administration of drugs has disadvantages such as- hepatic first pass metabolism and enzymatic degradation within gastrointestinal tract. So there has been a growing interest in

the delivery of the therapeutic agents through various transmucosal routes to provide a therapeutic amount of the drug to the proper site in body to promptly achieve and then maintain the desired concentration. The sublingual route provides rapid absorption and acceptable bioavailability of many drugs and is one of the most convenient, accessible and well accepted route. The sublingual mucosa is considered to be more permeable than buccal area and it is not able to provide the rapid absorption and good bioavailability. The sublingual mucosa is difficult for device placement because it lacks an expanse of smooth muscles or immobile mucosa and is constantly washed by a considerable amount of saliva. Because of high permeability and rich blood supply sublingual route provides a rapid onset of action. Moreover the absorption of drugs through the highly vascular lining of mouth moves the drug through the sublingual or buccal capillaries and veins to the jugular veins and superior vena cava directly to the heart and arterial circulation, without passing the liver, thus avoiding hepatic first pass metabolism. Moreover drugs showing poor and erratic absorption from the stomach; or intestine can be administered through the oral mucosa.[24-27]

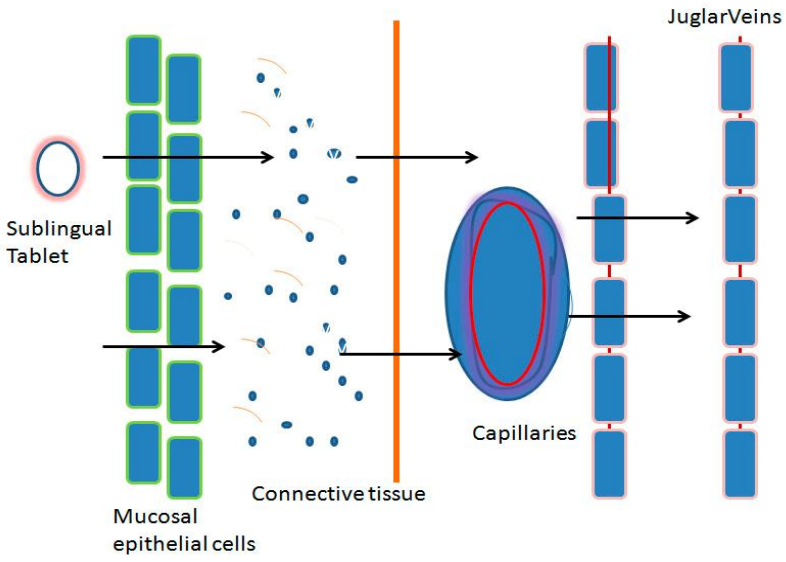


Figure 3: Mechanism showing sublingual absorption[24]

Factors Affecting The Sublingual Absorption[28,29]

1. Lipophilicity of drug: For a drug to be absorbed completely through sublingual route, the drug must have slightly higher lipid solubility than that required for GI absorption is necessary for passive permeation.

2. Solubility in salivary secretion: In addition to high lipid solubility, the drug should be soluble in aqueous buccal fluids i.e. biphasic solubility of drug is necessary for absorption.

3. pH and pKa of the saliva: As the mean pH of the saliva is 6.0, this pH favors the absorption of drugs which remain unionized. Also, the absorption of the drugs through the oral mucosa occurs if the pKa is greater than 2 for an acid and less than 10 for a base.

4. Binding to oral mucosa: Systemic availability of drugs that bind to oral mucosa is poor.

5. Thickness of oral epithelium: As the thickness of sublingual epithelium is100-200µm which is less as compared to buccal thickness. So the absorption of drugs is faster due to thinner epithelium and also the immersion of drug in smaller volume of saliva.

6. Oil to water partition coefficient: Compounds with favorable oil to water partition coefficients are readily absorbed through the oral mucosa. An oil water partition coefficient range of 40-2000 is considered optimal for the drugs to be absorbed sublingually.

Different Types of TABLETS

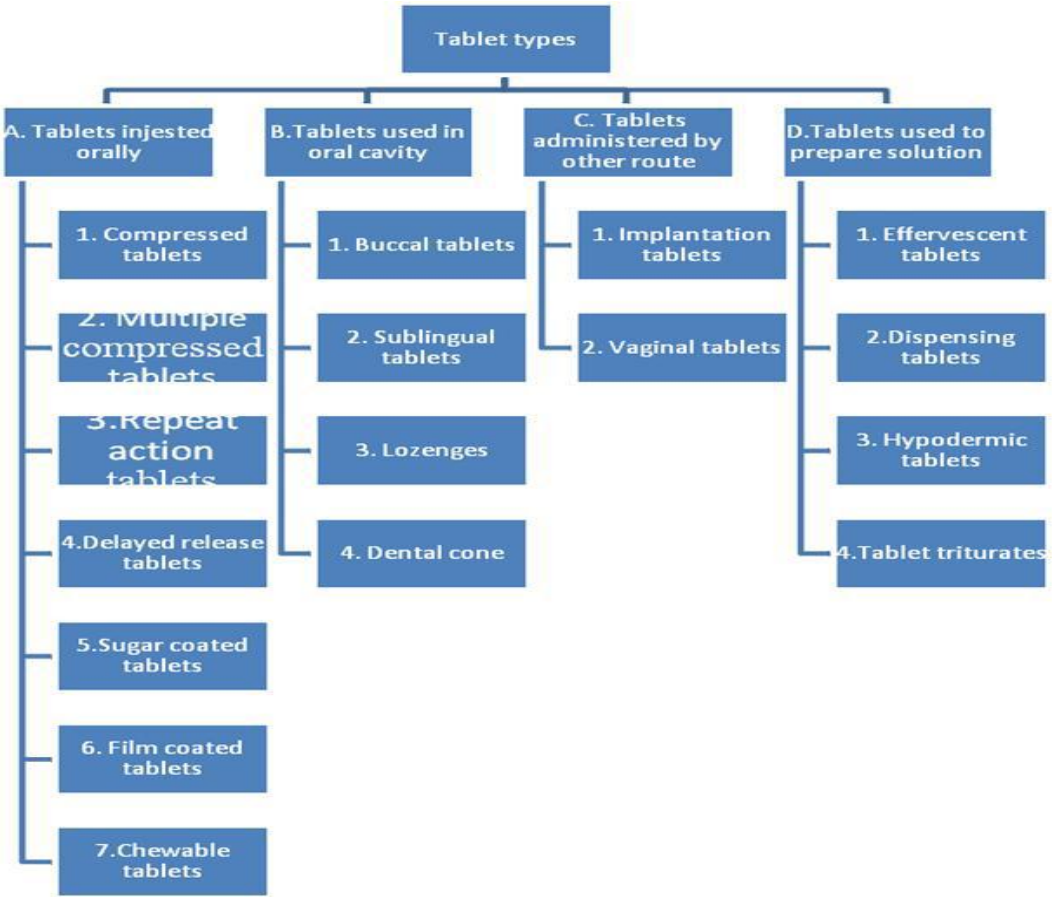


Figure 1: Different types of tablets.[30,31]

Sublingual Tablets

They are to be placed under the tongue and produce immediate systemic effect by enabling the drug absorbed directly through mucosal lining of the mouth beneath the tongue. The drug

absorbed from stomach goes to mesenteric circulation which connects to stomach via portal vein.Thus absorption through oral cavity avoids first pass metabolism. The tablets are usually small and flat, compressed lightly to keep them soft. The tablet must dissolve quickly allowing the drugs to be absorbed quickly. Table 1 depicts the drugs which have been used in formulation of sublingual tablets[30,32] It is designed to dissolve in small quantity of saliva. After the tablet is placed in the mouth below the tongue, the patient should avoid eating, drinking, smoking and possibly talking in order to keep the tablet in place. Swallowing of saliva should also be avoided since the saliva may contain dissolved drug. Bland excipients are used to avoid salivary stimulation. Table 2 depicts the excipients used in formulation of sublingual tablets. Various techniques can be used to formulate rapidly disintegrating or dissolving tablets.[30,33] Direct compression is one of these techniques which require incorporation of a superdisintegrant into the formulation, or the use of highly water-soluble excipients to achieve fast tablet disintegration. Direct compression does not require the use of water or heat during the formulation procedure and is the ideal method for moisture and heat-labile medications.[30,34] Sublingual, meaning literally 'under the tongue' refers to a method of administering substances via the mouth in such a way that the substances are rapidly absorbed via the blood vessels under the tongue rather than via the digestive tract. There is considerable evidence that most sublingual substances are absorbed by simple diffusion; the sublingual area acting rather likes litmus paper, readily soaking up the substances. However, not all substances are permeable and accessible to oral mucosa.

Table 1: Drugs used in sublingual tablets.

Drug	Category	Dosage form
Captopril	Antihypertensive agent	Tablet
Furesamide	Diuretic	Tablet
Scopolamine	Opioid analgesic	Spray
Ondansatron Hcl	Antiemetic agent	Film
Salbutamol Sulphate	Antiasthmatic agent	Film

Table 2: Excipients used in sublingual tablets.

Excipients	Uses
HPMC	Tablet binder, Stabilizing agent.
Lactose Monohydrate	Diluent, Tablet binder
Crosspovidone	Superdisintegrant
Cross carmellose sodium	Superdisintegrant
Sodium starch glycolate	Superdisintegrant

TYPES OF SUBLINGUAL TABLETS[35]

1.Fast Disintegrating Sublingual Tablets: Tablets that disintegrate or dissolve rapidly in the patients mouth are convenient for young children, the elderly;(pediatric, geriatric)patients with swallowing difficulties and in situations where potable liquids are not available.FDT is defined as a solid dosage form that contains medicinal substance and disintegrates rapidly(within few seconds) without water when kept on tongue. The drug is released, dissolved, or dispersed in saliva and then swallowed and absorbed across the git. FDT in general offers improved convenience and are frequently preferred over conventional solid oral dosage forms.ODT may lead to significant improvements over current treatment options for specific patient group, for instance pediatric patients. The European medicines agency committee for medicinal products for human use (CHMP) described ODT as having-great promise for children. The potential benefits of ODT formulation could be fully realized by considering the additional requirements of this group. The size and disintegration time play a very important role in commercial potential of the formulation. A fast disintegration time reduces any choking hazard and will also make it harder to spit out the dose. Similarly the taste and texture of pediatric formulation are critical to facilitate compliance in children, particularly in chronic conditions where repeated administration may be an issue. FDT sublingual tablets may show increased oral bioavailability. From the perspective of pharmaceutical industry, sublingual tablets may provide new business opportunities in the form of product differentiation, line extension and life cycle management, exclusivity, uniqueness and patent life extension.[35-37]

2.Bioadhesive Sublingual Tablets: The new sublingual tablet concept presented is based on interactive mixtures consisting of a water soluble carrier covered with fine drug particles and a bioadhesive component. With this approach it is possible to obtain a rapid dissolution in combination with bioadhesive retention of the drug in the oral cavity.[35,38]

3.Lipid Matrix Sublingual Tablets: Lipid matrix sublingual tablets is a bioavailable, quick, convenient and consistent dosage forms for many specially nutraceuticals that are often taken orally. Lipid matrix sublingual tablets is formulated using advances in sublingual and liposomal technology to create a dosage form that offers a faster and more complete absorption than traditional oral routes of administration.

4.Sublingual Vitamin Tablets: The only sublingual vitamin that all doctors recommend is vitamin B12 (cyanocobalamin).Vitamin-B12 is very much helpful in our bodyÊs metabolism. It is recommended to be taken orally.

5.Sublingual Immunotherapy: Sublingual immunotherapy, or SLIT, is a form of immunotherapy that involves putting drops of allergen extracts under the tongue. SLIT is usually delivered 1 of 2 ways-drops or tablets of allergen extracts are placed under the tongue, then either swallowed or spat out. Sublingual immunotherapy is very much helpful in the case of SAC (seasonal allergic conjunctivitis) and PAC (Perennial allergic conjunctivitis) which are spreading at a much faster rate among people who are working in industries and it needs longer sublingual immunotherapy, often one year around with mast cell stabilizers, antihistamines and sometimes local steroids. Conjunctivitis additionally needs corticosteroids and if needed cyclosporine drops are administered for longer time. WHO (WORLD HEALTH ORGANISATION) recommends SIT (allergen specific immunotherapy) for the patients with severe allergic conjunctivitis or asthma. SIT involves the monthly vaccination lasting for 3 years and this therapy may have side effects such as anaphylactic reactions. Therefore other administration routes have been considered such as sublingual immunotherapy (SLIT) with daily administration for at least 3 year is a new promising and safe alternative for SIT. Sublingual immunotherapy has an advantage over subcutaneous immunotherapy and it is one of the most effective and safe treatment for allergic-rhinitis. SLIT has gained ample evidence of efficacy and safety and in some European countries is currently used more frequently than sublingual immunotherapy (SCIT). Apart from its better safety profile , the advantage of SLIT over SCIT are with regard to compliance, which is higher because SLIT does not need to be administered in a medical setting and is much more cost-effective, but the desired outcome exist only if SLIT meets its needs. In recent years sublingual immunotherapy has emerged as an actual treatment option because of its clinical efficacy and safety.

Characteristics of Sublingual Tablets[39-44]

Due to the short residence time in the mouth, fast disintegration and dissolution is very important for the absorption of a drug following sublingual administration. For this reason, sublingual tablet formulations need to be designed in such a way that they disintegrate and dissolve rapidly in saliva, without the usage of any additional water to achieve this goal.

The physical and mechanical characteristics of a tablet, such as size, hardness, porosity, and wettability, play a crucial role in its disintegration time. A smaller sized tablet with low hardness and high porosity will disintegrate more rapidly than a larger or harder tablet.However, a tablet which is highly porous coupled with low hardness is more friable and prone to self-disintegration, and this presents problems during packaging and handling. During formulation development, all approaches to increase the mechanical strength of sublingual tablets should be probed, without compromising disintegration and dissolution properties of the sublingual tablet.

Following sublingual administration, the patient is advised to abstain from swallowing the tablet and avoid eating, drinking, or chewing to facilitate absorption of the drug through the sublingual membrane. Even swallowing saliva needs to be avoided, to prevent ingestion through the gastrointestinal tract where the drug absorption maybe inefficient or the drug may undergo degradation. Because these aspects pose some inconvenience to the patient, they should be taken into account at the formulation development stage to improve patient compliance.

Sublingual tablets promote rapid absorption and higher bioavailability with a fast onset of action. If the dissolution of the drug is incomplete, contact time with the sublingual membrane is short, and/or permeation is too low, part of the formulation may be swallowed and consequently not be absorbed through the sublingual membrane, with subsequent effects on the bioavailability of the drug. Many sublingual tablets may be compromised by the possibility that the patient may swallow the active pharmaceutical ingredient before it has been released and absorbed through the sublingual membrane into the systemic circulation.

Manufacturing Techniques Used In Sublingual Tablet Formulation.[39,45-57]

1. Direct compression: The direct compression method is most commonly used for commercial manufacture of sublingual tablets. It is a simple, cost-effective and efficient process, as it employs ingredients that can be blended well and do not require further granulation steps prior to lubrication and compression. Sublingual tablets manufactured using direct compression exhibit good mechanical strength and fast disintegration.The directly compressible sublingual tablet formulation contains directly compressible and water soluble excipients, a super disintegrant, and lubricants. It may also contain microcrystalline cellulose, a dry binder, buffers, surface-active agents, sweeteners, and flavors. Sugar-based excipients are widely used as bulking agents because of their high aqueous solubility, sweetness,

pleasant feeling in the mouth, and good taste-masking.Nearly all sublingual formulations incorporate some saccharide-based materials. The choice of a specific disintegrant and its quantity are critical for achieving quick disintegration and dissolution rates. If required during formulation development, effervescent agents are used to increase the disintegration and dissolution rates of certain sublingual tablet formulations.

2. Compression molding: Tablets manufactured by the compression molding process exhibit rapid disintegration and dissolution, which is usually within 5–10sec. These formulations pose special challenges during handling and packaging, because of their poor mechanical strength, they may require special packaging for the purpose of shipping.Alternatively, the mechanical strength of the formulations may be increased by using a suitable binder. However, the level of binder should be optimized to avoid any adverse effects on disintegration and dissolution of the formulation. The formulations for the compression molding process typically consist of soluble excipients to impart arapid and complete dissolution, and taste modifiers for patient compliance. Molded tablets can also be prepared directly from a molten matrix, in which the drug is dissolved or dispersed (heat molding), or by evaporating the solvent from a drug solution or suspension at normal room pressure which is called no vacuum lyophilization.The process of compression molding involves moistening of the formulation blend with a suitable solvent which is usually hydro-alcoholic, followed by molding into tablets under low pressure after which the moist tablets are finally dried. The lower compression pressure employed for molding and drying of the moist tablet produces a highly porous tablet structure with enhanced dissolution.The choice ratio and quantity of granulating fluids are critical to the physicochemical proper ties, performance, and stability of the formulation, and should be optimized. Several patented technologies are also available for the commercial manufacture of compression molded sublingual tablet formulations.

3. Freeze drying: The process of freeze drying (lyophilization) is expensive, time consuming, and produces tablets of poor mechanical strength. For these reasons, it is not a method which is used commonly to manufacture sublingual tablets. However, it has certain advantages over other processes, as the tablets made by this process have high porosity, and when placed under the tongue disintegrate and dissolve instantly. It is a process of choice for products that are unstable in nature or are thermolabile7The process involves of lyophilization involves lowering the temperature of the drug in an aqueous medium to below freezing, followed by the application of a high-pressure vacuum. To extract the water in the

form of a vapor, which is collected as ice on a condenser, a gradual temperature rise is applied during the drying process.The product temperature at the ice sublimation interface and the temperature during formulation collapse are critical to obtain a freeze-dried cake of the drug which has optimum specifications. This process helps to retain the physical structure and preserves the material during storage or transport.The resulting formulationshave a low weight and have highly porous structures that allow rapiddissolution or disintegration. The freeze-drying process may result in a product with anamorphous structure, leading to an enhanced dissolution rate. However, tablets formulated using the freeze drying process possess poor stability at elevated temperatures and humidity conditions.

4. Hot melt Extrusion: In the production of pharmaceutical formulations, a homogeneous and consistent mixing of multiple formulation ingredients is required. In the production of pharmaceutical formulations, which require homogeneous and consistent mixing of multiple formulation ingredients, a twin screw extruder is used because the rotation of the intermeshing screws provides better mixing to produce a homogeneous solid containing finely dispersed drugparticles, or a solid-solution of drug in polymer. This can improve the dissolution rate and bioavailability of poorly-water soluble drug formulations. A uniformly distributed active pharmaceutical ingredient is also a pre-requisite for the production of drug-eluting devices with intra and inter-batch reproducibility of drug-release kinetics.

Evaluation[58-67]

1. General Appearance: The general appearance of a tablet, its visual identity and over all "elegance" is essential for consumer acceptance. Include in are tablet's size, shape, colour, presence or absence of an odour, taste, surface texture, physical flaws and consistency and legibility of any identifying marking.

2. Size and Shape: The size and shape of the tablet can be dimensionally described, monitored and controlled.

3. Tablet Thickness: Tablet thickness is an important characteristic in reproducing appearance and also in counting by using filling equipment. Some filling equipment utilizes the uniform thickness of the tablets as accounting mechanism. Ten tablets were taken and their thickness was recorded using micrometer.

4. Wetting Time: A piece of tissue paper (12 cm X 10.75 cm) folded twice was placed in a small petri dish (ID = 6.5 cm) containing 6 ml of Sorenson's buffer pH 6.8. A tablet was put on the paper, and the time for complete wetting was measured. Three trials for each batch and the standard deviation were also determined.

5. Uniformity of Weight: I.P. procedure for uniformity of weight was followed, twenty tablets were taken and their weight was determined individually and collectively on a digital weighing balance. The average weight of one tablet was determined from the collective weight. The limit for weight variation.

6. Friability: It is measured of mechanical strength of tablets. Roche friabilator can be used to determine the friability by following procedure. A preweighed tablet was placed in the friabilator. Fribaiator consist of a plastic-chamber that revolves at 25 rpm, dropping those tablets at a distance of 6 inches with each revolution. The tablets were rotated in the friabilator for at least 4 minutes. At the end of test tablets were dusted and reweighed, the loss in the weight of tablet is themeasure of friability and is expressed in percentage as %Friability = loss in weight / Initial weight x 100.

7. Tablet Hardness: Hardness of tablet is defined as the force applied across the diameter of the tablet in the order to break the tablet. The resistance of the tablet to chipping, abrasion or breakage under condition of storage transformation and handling before usage depends on its hardness. Hardness of the tablet of each formulation was determined using Monsanto Hardness tester.

8. In-Vitro Dispersion Time: In-vitro dispersion time was measured by dropping a tablet in a beaker containing 50 ml of Sorenson's buffer pH 6.8. Three tablets from each formulation were randomly selected and in vitro dispersion time was performed.

9. In-Vitro Disintegration Test: The test was carried out on 6 tablets using the apparatus specified in I.P. 1996 distilled water at 37ºC ± 2ºC was used as a disintegration media and the time in second taken for complete disintegration of the tablet with no palable mass remaining in the apparatus was measured in seconds.

CONCLUSION

Sublingual medication conveyance has been utilized for definition of numerous medications with perspective purpose of fast medication discharge and speedy onset of activity.

Sublingual items were produced to defeat the trouble in gulping ordinary tablet, among pediatric, geriatric furthermore, psychiatric patients with dysphagia. Compared to regularly utilized tablets, cases and other oral measurements shapes, sublingual absorption is by and large much quicker and more effective. Therefore sublingual tablets are an accepted technology for systemic delivery of drugs.

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