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A Review on Migraine Treating - Orodispersible Drugs

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ABSTRACT:

This is the most preferred route of drug administration by the oral route. Orodispersible tablets are gaining attention among new oral drug delivery systems. They have some additional advantages and significance compared to other oral formulations that are well tolerated. Available in a solid dosage form that disintegrates in less than a minute. Therefore, this drug delivery mode is useful for proper oral dosing in pediatric and geriatric populations with swallowing problems. To improve bioavailability and patient compliance, orodispersible tablets are formulations that dissolve quickly (1-3 minutes) in the mouth without the need for chewing or drinking water upon oral administration. Therefore, orally dispersible drug delivery systems are mainly used. Compared to traditional tablets and capsules, orodispersible tablets (ODT) have been used in the past 30 years due to their ease of administration for children and the elderly, and better patient compliance due to better solubility and stability. It has attracted attention over the years. Orodispersible tablets contain mainly active ingredients in solid dosage form, including super-disintegrants that disperse the tablets quickly, so they are of a quality that dissolves quickly on the tongue within seconds.

Keyword : Migraine treatment, oral dispersible tablet, NDDS, new dosage form

Introduction:

The oral route of drug delivery is the most preferred and common route of drug administration for both solid and liquid dosage forms. Many people have difficulty swallowing tablets and hard gelatin capsules. This difficulty in swallowing is called aphasia. Oral solid dosage forms are popular for their ease of administration, precise dosing, self-medication, pain avoidance and, most importantly, patient compliance. This problem has been found to occur in all patient populations, but particularly in pediatric and geriatric populations. Thus, these conventional dosage forms result in a high incidence of swallowing-related non-compliance and ineffective treatment, especially for pediatric, geriatric, or psychiatric patients. Most pharmaceutical dosage forms formulated for oral administration are intended for direct ingestion. The oral route of administration is the best or most convenient route of drug administration for patients, and this route is used by most therapeutic agents to induce oral route effects. "European Pharmacopoeia" A term used in orodispersible tablets. This tablet dissolves in the mouth within 3 seconds before swallowing. Orally dispersible tablets, also known as "ODT". It is a rapidly disintegrating tablet or an orally disintegrating tablet that also gives a rapid onset of action with its porous and rapid dissolving properties, so it dissolves quickly in the mouth within seconds.Freeze-drying, tablet Molding, spray drying, bulk extrusion, sublimation and direct compression are the traditional methods used to produce orally disintegrating tablets. ODT has a very fast response time (rapid onset of action) and its decay time is 3 seconds to 1 minute. According to the U.S. Food and Drug Administration (FDA), ODTS are solid substances containing active ingredients and medicinal substances that quickly dissolve in the mouth within seconds when placed on the tongue. When the ODTS comes into contact with saliva, these tablets disperse, releasing the active ingredient, which provides maximum bioavailability of the drug compared to conventional dosage forms. Hydrophilic excipients are used in his ODT technique and are selected based on the physicochemical properties of the drug, primarily hydrophilic or hydrophobic. In saliva, active ingredients dissolve rapidly independently of membrane contact unless protected by pre-gastric absorption. The current review aims to assess the current efficacy of his ODT medications in migraine treatment and the sustainability and characteristics of drug candidates for investigating ODT. (Ref. 2)

- **Migraine**

Definition :

Acute migraine is a disabling disorder characterized by moderate to severe pain often associated with photophobia, phonophobia, nausea and vomiting.

- **Migraine Causes**

Vasocondtriction , coronary artery disease ,Food products, Stress, Changes in wake sleep pattern, Physical factors, Medications and Changes in brainstem and their interaction with trigeminal nerve

- **Migraine Symptoms:**

Arythmias, myocardial infraction, Nausea, Vomiting, Moderate to severe pain, Photophobia, Phonophobia .

- **Treatment of Migraine includes :**

1) First line treatment :

a) Combination analgesics

b) Triptans –like sumatriptan, rizatriptan, zolmitroiptan, etc

2) Other tratments :

a) Anti-emetics eg. ergotamin

Migratory pathophysiology and mechanism of action of orally administered triptans

The goal of acute migraine treatment is to treat the disease quickly in a shorter time with low treatment costs, and with patience to restore work capacity as soon as possible. Currently, effective serotonin 5-HT1B/1D receptor agonists, collectively called triptans, are used to treat migraine. There are seven triptans in the market which are Sumatriptan, Zolmitriptan, Naratriptan, Rizatriptan, Eletriptan, Almotriptan and the newest triptan comes on the scene "Frovatriptan". Sumatriptan, Rizatriptan and Zolmitriptan are the three triptans we are looking at. Although all triptans share the same pharmacological mechanism of action, they have different pharmacokinetic profiles that make each triptan a unique property. The main basis for determining the effectiveness of a triptan is "painless response within one hour" after drug administration. Based on this, triptans are broadly divided into two categories: "high-potency" triptans, which have a faster onset, high potency, and high relapse rates. It contains Sumatriptan, Zolmitriptan, Risatriptan, Almotriptan and Eletriptan. The second group includes low-potency triptans, which have a slower action, low potency and lower relapse rates. It contains naratriptan and frovatriptan. (reference 5)

- Sumatriptan

Sumatriptan Sumatriptan is a synthetic drug that belongs to the class of triptans and is used to treat migraines. Sumatriptan is structurally similar to 5-hydroxytryptamine and is a 5-HT1D receptor agonist. Sumatriptan occurs at the 1D receptor. It is located in the central nervous system and blood vessels and exerts effects such as cerebral vasoconstriction. It is also available as suppositories in more than 15 countries. Sumatriptan is the most studied drug in the history of migraine treatment. Since its release in Europe in 1991, it is estimated to have been used for more than 200 million seizures in nearly 10 million patients before 1900. facilitates return to work and most normal daily activities for most patients. The lowest effective dose is 25 mg, and optimal doses range from 50 to 100 mg, with higher doses showing no improvement in efficacy, but more side effects occurring as the dose increases. Some recent studies show an additional effect of a 100 mg tablet when taken for mild pain during a progressive migraine attack. (reference 3)

- Rizatriptan

A new formulation of oral films containing risatriptan benzoate prepared by solvent casting method using different concentrations of hydroxypropylmethylcellulose (HPMC K4M), polyvinyl alcohol (PVA), polyethylene oxide (PEO), glycerol, stevia and goat oral mucosa as model films. . Risatriptan was also synthesized in the hope of creating a faster acting and more lipophilic tablet. The drug is available in two oral strengths, 10 mg and 5 mg, with 10 mg being the recommended starting dose in most countries. This can be repeated 2 hours after the headache continues. Rizatriptan is also available as an ODT, which can be taken without liquids at the same doses. The oral bioavailability of risatriptan is high, 45%. Half life is 2...3 hours and Tmax is 1.3 hours for regular tablet and slightly longer for ODT. Like zolmitriptan ODT, Rizatriptan ODT is not absorbed from the oral mucosa but dissolves and is then swallowed with saliva for absorption from the gastrointestinal tract. The 2-hour TG of this preparation varies from 19% to 46%. Head-to-head comparisons with Smatriptan, Zolmitriptam and Rizatriptan show that Rizatriptan 10 mg is more likely to produce a pain-free response at 2 hours and a sustained 2-hour pain-free response. Risatriptan was also synthesized in the hope of creating a faster acting and more lipophilic tablet. The drug is available in two oral strengths, 10 mg and 5 mg, with 10 mg being the recommended starting dose in most countries. This can be repeated 2 hours after the headache continues. Rizatriptan is also available as an ODT, which can be taken without liquids at the same doses. The oral bioavailability of risatriptan is high, 45%. The half-life is 2...3 hours and the Tmax is 1.3 hours with the regular tablet and slightly longer with the tablet. ODT. (ref. 15)

- Zolmitriptan

It is not used to prevent migraine headaches and it is not used for cluster headaches. Zolmitriptan works in the brain to relieve the pain caused by a migraine headache. Many people find that after taking zolmitriptan, their headaches disappear completely. This medication is usually used in people whose headaches are not relieved by acetaminophen, aspirin, or other pain relievers. Zolmitriptan has caused serious side effects in some people, especially people with heart or blood vessel disease. Be sure to discuss the risks and benefits of using this medication with your doctor. In the early stages of migraine, the dose is 2.5 to 5 mg, and a repeat dose can be given after two hours. US and EU regulatory authorities maximum dose of 10 mg / 24 hours. The recommended starting dose of 2.5 mg provides the best balance of benefits and side effects, with some patients achieving complete and repeated relief with the higher dose of 5 mg, which is only available in the United States and Sweden. The frequency of recurrence varies from 22-37%. (ref. 8)

Medications :

SR. NO.	DRUG NAME	FORMULATION	REQUIRED STRENTH	MAXIMUM STRENTH
1	SUMATRIPTAN	-Oral formlation -Nasal formulations -Subcutaneous formulations -Rectal formulation	25mg,50mg,100mg 5mg, 10mg, 20 mg 4mg, 6mg 25 mg	200 mg 40mg 12mg 50 mg
2	RIZATRIPTAN	-Oral formulation -Sublingual tablet	5mg, 10mg 5mg, 10mg	20mg 20mg
3	ZOLMITRIPTAN	-Oral formulation -Orally disintegrating tablet -Nasal formulations	1.25mg, 2.5mg,5mg 2.5mg , 5mg 2.5mg, 5mg	10mg 10mg 10mg

Clinical features :

FEATURES	SUMATRIPTAN	RIZATRIPTAN	ZOLMITRIPTAN
1-Fastest Onset	Yes	Yes	Yes
2-Higher Potency	Yes	Yes	Yes
3-Higher Recurrence	Yes	Yes	Yes

ADVERSE EFFECTS

These triptans can cause dry mouth, nausea, drowsiness, dizziness, coronary vasoconstriction, and skin reactions. The most common side effects associated with triptans are paresthesia, redness, tingling, neck pain, chest tightness, and are referred to as "triptan sensations." These side effects are most common with subcutaneous triptan injection and may be less severe with other formulations. The severity of side effects can vary between triptans. (ref. 13) Triptan-related nausea was compared in a post hoc analysis of five randomized, placebo-controlled, double-blind clinical trials. (ref. 5) Nausea was comparable with risatriptan 10 mg and sumatriptan (25 mg, 50 mg or 100 mg).

Contraindications

Triptans can cause narrowing of the coronary arteries and blood vessels in the extremities. Therefore, they are contraindicated in patients with a history of myocardial infarction, coronary artery disease, cerebrovascular disease, hemiplegic migraine, chronically uncontrolled high blood pressure or peripheral vascular disease. Some contraindications are severe liver or kidney failure and age over 65 years. All triptans, except sumatriptan, are contraindicated during pregnancy and lactation. Based on data from pregnancy registries, sumatriptan is safe during pregnancy and breastfeeding. (ref. 6) Here, there is insufficient evidence that triptans increase the risk of serotonin syndrome either as monotherapy or in patients taking SSRIs or selective serotonin-norepinephrine reuptake inhibitors (SNRIs).

CONCLUSION :

Orodispersible tablets (ODTs) are a new oral drug delivery system. This research his use of ODT drugs in the treatment of migraine and the sustainability and efficacy of drug candidates, Characterization with other ODTs, more promising investigations will be conducted here A space that leads to newer, cheaper and better products in migraine treatment. consideration Can be adopted by pharmaceutical companies as it occurs in patient compliance and satisfaction with results Benefits of ODT for product line extensions or first-to-market products. research helps Understanding rapid onset of drug action to achieve patient compliance in pediatric and geriatric patients Those who have good efficacy and cannot swallow directly..

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