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## Mouth Dissolve Tablets of Sumatriptan Succinate

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Mouth dissolve tablets of sumatriptan succinate were prepared using disintegrants, sodium starch glycolate, carboxy methylcellulose sodium and treated agar by direct compression method. The prepared tablets were evaluated for thickness, uniformity of weight, content uniformity, hardness, tensile strength, porosity, friability, wetting time, water absorption ratio, *in vitro* and *in vivo* disintegration time and *in vitro* drug release. The tablets disintegrate *in vitro* and *in vivo* within 10 to 16 s and 12 to 18 s, respectively. Almost 90% of drug were released from all formulations within 10 min. The formulations containing combination of sodium starch glycolate and carboxy methyl cellulose was found to give the best results. The tablets apart from fulfilling all official and other specifications, exhibited higher rate of release.

Sumatriptan succinate is a potent and selective 5-hydroxytryptamine agonist. Chemically it is 3-[2-(dimethylamino) ethyl]-N-methyl-1H-indol-5-methanesulfonamide butane-1,4-dioate<sup>1</sup>. It is an effective agent in the treatment of acute migraine attack. It provides rapid symptoms relief up to 85-90% of migraine patients within 2 h of treatment<sup>2</sup>. However, oral bioavailability is poor with only 14% of the dose reaching systemic circulation<sup>3</sup>. This is likely due to extensive pre-systemic clearance on first pass. As migraine sufferers have markedly reduced functional ability, they would be benefited from acute treatment that helps them to resume their functional

activities as quickly as possible. Rapid onset of action was demonstrated an important attribute for an acute migraine treatment.

Mouth dissolving tablets which disintegrate or dissolve in saliva and swallowed without the water<sup>4</sup>. As tablet disintegrates in mouth this could enhance the clinical effect of the drug through pre-gastric absorption from the mouth, pharynx and esophagus this leads to an increase in bioavailability by avoiding first pass liver metabolism<sup>5</sup>. Sumatriptan succinate was obtained as a gift sample from Natco Pharma Ltd. Hyderabad. Avicel PH-102 was a gift sample from Reliance cellulose, Secunderabad. Aerosil and flavor was obtained from Epic Pharmaceuticals, Satara. Sodium starch glycolate (SSG), carboxy methylcellulose

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(CMC), and agar powder, sodium saccharine, colloidal silicon dioxide and magnesium stearate were purchased from Loba Chemicals, Mumbai. Other reagents are of analytical grade.

Mouth dissolve tablets of sumatriptan succinate were prepared using sodium starch glycolate, carboxy methylcellulose, treated agar, and microcrystalline cellulose by direct compression technique<sup>6</sup> (Table 1).

The prepared tablets were evaluated for uniformity of weight as per IP (1996) procedure. Hardness was measured using the Pfizer Hardness tester. Friability of the tablet was determined in a Roche Friabilator. Wetting time was measured by placing a tablet on a piece of tissue paper folded twice in a small culture dish containing 5 ml of water. *In vitro* disintegration time was determined by dropping a tablet in a container containing 5 ml of pH 6.8 phosphate buffer and *in vivo* disintegration time was determined by placing a tablet on the tongue and allowed to disintegrate without biting or drinking water.

The absorbance of sumatriptan succinate was measured after suitable dilution at 228 nm using GBC UV/Vis 911-A spectrophotometer. The dissolution rate was studied using USP XXI dissolution test apparatus (VEEGO Tablet dissolution test apparatus DA 6D) with a paddle stirrer in 900 ml of pH 6.8 phosphate buffer. Tablet containing 50 mg of sumatriptan succinate a speed of 100 rpm and a temperature of 37±0.5° were used in each test. Samples of dissolution medium were withdrawn and passed through a filter at different time intervals, suitably diluted and assayed for sumatriptan succinate by measuring absorbance at 228

nm<sup>7</sup>. Sumatriptan succinate release was faster from all the prepared formulation as compared to conventional tablets (fig. 1).

All the tablets were found to contain sumatriptan succinate within 100±5% of the labeled claim. Hardness of the tablets was in the range of 2.62±0.20 to 2.84±0.23 kg / cm<sup>2</sup> (n=5). The percentage weight loss in the friability test

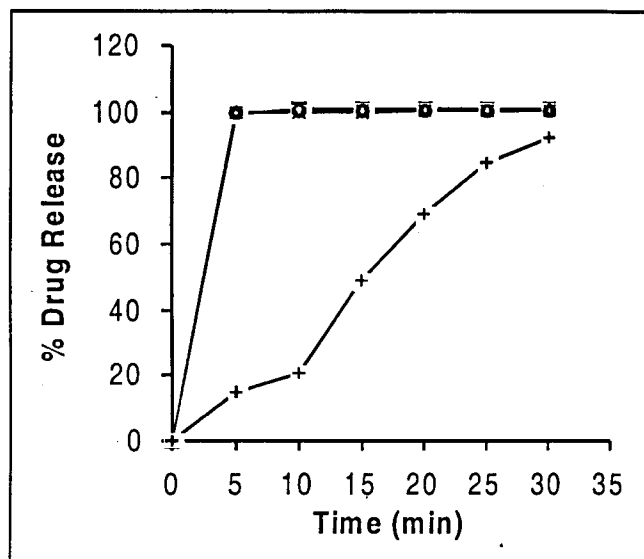


Fig 1: *In vitro* release profiles of Sumatriptan succinate from prepared tablets and marketed conventional tablet. Prepared formulations, F1 (-♦-), F2 (-■-), F3 (-▲-), F4 (-x-), F5 (-\*-), F6 (-●-) and marketed conventional tablet (-+-).

TABLE 1: FORMULAE OF TABLETS PREPARED

| Ingredients(mg/tablet)          | F1  | F2  | F3  | F4  | F5  | F6  |
|---------------------------------|-----|-----|-----|-----|-----|-----|
| Sumatriptan succinate           | 50  | 50  | 50  | 50  | 50  | 50  |
| Sodium starch glycolate.        | 8   | 4   | 8   | 4   | 8   | -   |
| Carboxy methyl cellulose sodium | 4   | 2   | 2   | 4   | -   | 2   |
| Treated Agar                    | -   | -   | -   | -   | 2   | 2   |
| Avicel-PH 102                   | 119 | 125 | 121 | 123 | 121 | 127 |
| Mannitol                        | 10  | 10  | 10  | 10  | 10  | 10  |
| Magnesium stearate              | 1   | 1   | 1   | 1   | 1   | 1   |
| Colloidal Silicon dioxide       | 2   | 2   | 2   | 2   | 2   | 2   |
| Flavor                          | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| Sodium Saccharine               | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |

was less than 1% in all the batches. The time required for complete wetting was found to be between 8 to 11 s. All the tablet formulations disintegrated rapidly *in vitro* within 10-16 s and *in vivo* within 12-16 s. The tablets containing SSG and CMC showed faster disintegration than containing CMC and treated agar. The release rate of sumatriptan succinate from the formulations F1, F3, F5 was found faster than F2, F4, F6 and conventional formulation (Suminat® 50mg, Natco Pharma Ltd., Hyderabad). The tablets, apart from fulfilling all official and other specification, exhibited faster release rates of sumatriptan succinate.

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## A new Spectrophotometric Estimation of Chloroquine Phosphate from Tablets

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**A simple spectrophotometric method for determination of chloroquine was described. The method was based on bromination of the drug with excess brominating mixture in acidic medium. The yellow colour developed was measured at 350 nm against distilled water blank. Beer's law was obeyed between 40-200 µg/ml.**

Chloroquine phosphate, chemically (RS)-4-(7-chloro-4-quinolyl amino)-pentyl diethylamine diphosphate, used as an antimalarial and antiamebic. IP<sup>1</sup> has reported non-aqueous method, while BP<sup>2</sup> has described titrimetry using 0.1 M sodium hydroxide as a titrant. Other methods of estimation include colorimetry<sup>3,4</sup>, spectrophotometry<sup>5-7</sup>, spectrophotometric microdetermination<sup>8</sup> and spectrophotometric charge transfer complexation<sup>9,10</sup>.

In the present communication, a simple spectrophotometric method has been developed for the estimation of chloroquine phosphate from pharmaceutical preparations. The proposed method was based on the

bromination of the drug with excess brominating mixture in acidic medium. After bromination, the excess brominating mixture was treated with potassium iodide, gives yellow colour. The maximum absorbance was measured at 350 nm. The proposed method has not been studied earlier for estimation of chloroquine phosphate in tablets.

All measurements were done on a Milton Roy 1001 plus spectrophotometer using 10 mm matched quartz cuvettes. All analytical grade chemicals were used and all of the solutions were freshly prepared with double distilled water. 4 N hydrochloric acid was prepared and standardized with standard procedure. Potassium iodide (0.1 N) was prepared by dissolving 0.166 g in 100 ml distilled water. Brominating mixture solution (0.1 N) was prepared by

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