

Overdose of selective serotonin (5HT1) agonists

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Objective

The aim of the study was to assess the toxicity of serotonin (5HT1) agonists in overdose, because there is little information in the literature on this topic.

Method

In a retrospective study, cases of overdose of serotonin (5HT1) agonists from nine Poisons Information Centres in Austria, Germany, and Switzerland were analysed. Inclusion criteria were monointoxication, defined dose, and documented follow up.

Case series

Patients and dose

In total, 59 cases of overdose of serotonin (5HT1) agonists were registered (almotriptan 3, eletriptan 3, frovatriptan 3, naratriptan 13, rizatriptan 7, sumatriptan 10, zolmitriptan 20). Patients involved were 42 children (0.08 – 13 years) and 17 adolescents and adults (17 – ≤ 65 years). Doses expressed as a multiple of the maximum single dose for adults ranged between 0.125 – 2 (median 1) in children and 1 – 50 (median 4) in adolescents/adults (Table 1).

Table 1: Cases of poisoning by selective serotonin (5HT1) agonists

Drug	Number of cases	Age (years) median (range)	Dose (mg) median (range)	Dose (multiple of MSD) median (range)	Maximum single dose (MSD)
almotriptan	3	1.5 (1.3 – 13)	12.5	1	12.5
eletriptan	3	53 (1.3 – 56)	880 (40 – 1600)	11 (0.5 – 20)	80
frovatriptan	3	3 (2 – 3)	2.5	0.5	5
naratriptan	13	2.5 (1.4 – 47)	2.5 (1.25 – 10)	1 (0.5 – 4)	2.5
rizatriptan	7	3 (1.25 – ≤ 65)	10 (7.5 – 50)	1 (0.75 – 5)	10
sumatriptan	10	7 (1.75 – ≤ 65)	100 (25 – 5000)	1 (0.25 – 50)	100
zolmitriptan	20	4 (0.08 – 57)	5 (0.625 – 30)	1 (0.125 – 6)	5

Symptoms and severity

67 % of children remained asymptomatic, 31 % developed mild symptoms (Fig. 1). Only a one-month-old baby suffered from moderate symptoms with dyspnoea and respiratory acidosis after nasal application of 5 mg zolmitriptan. In adolescents/adults almost half of the patients developed mild (35.3 %) or moderate symptoms (11.8 %).

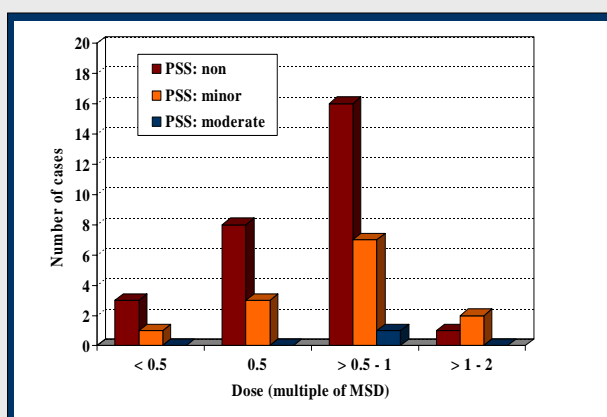


Fig. 1: Doses ingested and severity of poisonings (PSS) caused by serotonin (5HT1) agonists in children

Most frequent symptoms were fatigue (23 %), somnolence (18 %), hypertension (18 %), nausea/vomiting (18 %), dizziness (14 %), and tachycardia (9 %) (Table 2). In moderate poisonings, pronounced hypertension and angina pectoris were observed in an adult and adolescent after ingestion of a 4-fold and 6-fold maximum single dose of sumatriptan and naratriptan, respectively.

References:

- Borys D, Hill K, Morgan D. Triptans in pediatric overdose. Is medical treatment necessary? Clin Toxicol 2002; 40: 665-6
- Des Lauriers C, Burda A. Pediatric ingestions of triptans. Clin Toxicol 2008; 46: 614.

Table 2: Symptoms caused by poisoning with serotonin (5HT1) agonists – Case number and frequency in % of all symptomatic cases

Symptom	Case number (frequency in %)
fatigue	5 (22.7)
somnolence	4 (18.2)
dizziness	3 (13.6)
gait disturbance	1 (4.5)
paraesthesia	1 (4.5)
coma	1 (4.5)
hypertension	4 (18.2)
tachycardia	3 (13.6)
angina pectoris	2 (9.1)
circulatory distress	1 (4.5)
dyspnoea	1 (4.5)
nausea/vomiting	4 (18.2)
abdominal discomfort	1 (4.5)
dry mouth	1 (4.5)
respiratory acidosis	1 (4.5)
visual disturbance	1 (4.5)
urticaria	1 (4.5)
exanthema	1 (4.5)
asthenia	1 (4.5)

Conclusion

After ingestion of a dose up to the maximum single dose for adults by children, there is no or only mild toxicity. This is in accordance with the results of previous studies suggesting an observation at home for children with unintentional ingestion of an adult therapeutic dose (1, 2). In adults, doses from the 4-6-fold maximum single dose can induce moderate toxicity. However, the final assessment of toxicity of serotonin (5HT1) agonists requires further studies with more cases.