POISONING AFTER INGESTION OF CLONIDINE EYE DROPS IN CHILDREN

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Objective

Clonidine containing ophthalmic preparations are used for all forms of glaucoma and ocular hypertension in Germany. The concentration ranges from 0.625 to 2.5 mg per mL. To estimate the toxic risk after ingestion of clonidine eye drops in children we reviewed our poisoning cases.

Case PIC 200007646 - 2-year-old female 12 kg - DOSE: unknown; SYMPTOMS: somnolence, bradyarrthythmia, cutis cool, pale, and sweaty; temperature 36.2 to 36.8°C.

Case PIC 199809694 - 11-months-old male - DOSE: unknown; SYMPTOMS: somnolence, miosis, bradypnoea, hypotension.

Case report

Patient: **2-year-old female 8 kg body weight**;
learning difficulties owing to hypothyroidism.

Routes of exposure and dose:
Ingestion of maximum **1 mL Clonid-Ophtal® 1/8 % (0.125%Clonidin)**, maximum **1.25 mg** and **156 micrograms/kg**, respectively.

Time of admission: 6 to 7 hours after ingestion

Clinical features:

- **Initial symptoms**: ***45 min postingestion deep sleep for several hours***
- **Symptoms at time of admission**:
  fluctuating level of consciousness between somnolence and restlessness, respiratory depression, bradycardia, hypotension (60/36 mmHg), hypothermia, and miosis
- **Cardiac monitoring**:
  sinus bradycardia (60 to 75 beats/min); no atrioventricular block
- **Breathing**:
  intermittent respiratory rate and depth of breathing (8/min; SpO_2 90 %)
- **Toxicological analysis**:
  Clonidine in serum **3.3** micrograms/L **7 h hours postingestion**
  Therapeutic range **0.2 - 2.0** micrograms/L [Dollery 1991]
  Toxic range **25.0 - 50.0** micrograms/L [Schultz & Schmoldt 1994]

Treatment and course:

Supportive measures; intubation and artificial ventilation were not necessary; sinus node arrhythmia disappeared without intervention; the patient was sleeping still for 3 hours after admission; awakening was possible at any time; patient was discharged healthy 3 days postingestion.

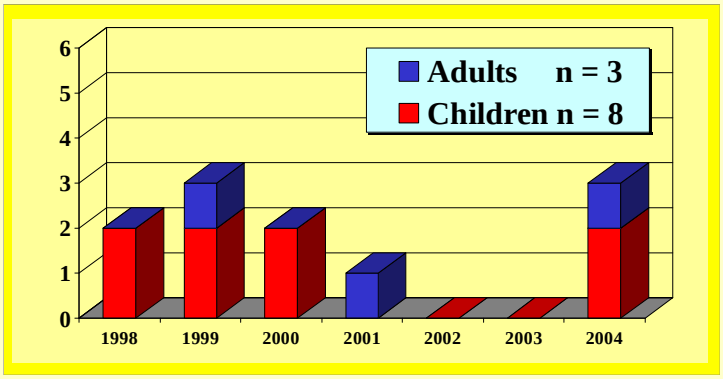
Case series 1994 - 2004

Frequency: 11 cases (exposures)
Patients: 1 infant (9.1%), 7 toddlers (63.6%), 3 adults (27.3%)
Causes: 7 unintentional (63.6%), 1 mistake (9.1%), 3 other (27.3%)
Dose: commonly unknown (few mL. estimated)
Estimated risk: 4 possibly toxic (36.4%), 3 moderate toxic (27.3%), 3 severe toxic (27.3%), 1 indefinable (9.1%)

Literature

Erickson SJ, Duncan A. Clonidine poisoning - an emerging problem: epidemiology, clinical features, management and preventative strategies. J Paediatr Child Health 1998;34:280-282.

Case series PIC Erfurt 1994 - 2004



Available Preparations in Germany

Preparation		mL	mg/mL	mg in all
Aruclonin®	1/8 %	10	1.250	12.50
Clonid-Ophtal®	1/16 %	10	0.625	6.25
Clonid-Ophtal®	1/8 %	10	1.250	12.50
Dispaclonidin®	1/8 %	10	1.250	12.50
Isoglaucon®	1/16 %	10	0.625	6.25
Isoglaucon®	1/8 %	10	1.250	12.50
Isoglaucon®	1/4 %	10	2.500	25.00

Toxicity

THERAPEUTIC DOSE

- Adults
  0.15 - 0.3 mg/d
  (0.002-0.004 mg/kg/d)
- Children
  0.003 - 0.006 mg/kg/d

TOXIC DOSE OF CLONIDINE EYE DROPS

- Adults
  0.600 mg corresponding to eye drops:
  1.00 mL 1/16 %, 0.50 mL 1/8 %, 0.25 mL 1/4 %
- Children
  0.100 - 0.125 mg corresponding to eye drops:
  0.200 mL 1/16%, 0.100 mL 1/8%, 0.050 mL 1/4%

Conclusion

- Poisoning with clonidine eye drops in infants and toddlers occurs after ingestion of very small doses (50 to 100 microlitres).
- Doses above 10 micrograms/kg cause cardiovascular symptoms. Doses above 20 micrograms/kg can result in respiratory depression.
- Symptoms usually appear within 30 to 60 min after ingestion, but were sometimes ignored by minders.
- To prevent such severe unintentional ingestions it is necessary to inform parents adequately about save storage and early symptoms of clonidine poisoning.