

MEDICATION ERRORS IN INTRATHECAL APPLICATION - A RARE BUT SEVERE OCCURENCE

D. Prasa, S. Kutz, M. Deters, H. Hentschel

Poisons Information Centre Erfurt, Nordhäuser Straße 74, D-99089 Erfurt, Germany

Objective

Medication errors are a possible cause of drug poisoning. The aim of this study was to investigate the incidence of errors in intrathecal application of drugs reported to the Poisons Information Centre (PIC) Erfurt to get further information for effective prevention.

Conclusion

In comparison with other routes, intrathecal application plays a minor role in the administration of drugs. Accordingly, medication errors in intrathecal application rarely occur. However, they may result in severe poisoning and even fatal outcome as demonstrated by case reports from other authors [1-4] and the cases reported to the PIC Erfurt.

Case Series

From 1999 to 2008 the PIC Erfurt was consulted in 1153 cases of iatrogenic medication errors, representing 1.5 % of all enquiries regarding drug poisoning. Only seven of them (0.6 %) are related to intrathecal application. All patients affected by intrathecal medication errors were adults. Two patients were assessed as to

be at moderate risk, whereas in 5 cases the risk of toxicity was severe. The drugs involved were morphine, baclofen, and methylene blue. In five cases drugs were overdosed inadvertently. Morphine was applied intrathecally instead of epidurally. Methylene blue was used in false indication.

Intrathecal medication errors reported to the PIC Erfurt 1999 - 2008

| Drug | Patient | Dose | Type of error | Symptoms | Risk of toxicity |
|----------------|------------------|---------|----------------------------|--|------------------|
| Morphine | adult, female | 140 mg | overdose | CNS depression | moderate |
| Morphine | 70 years, male | 280 mg | overdose | respiratory insufficiency, dyskinesia, paraesthesia and pain of the legs | severe |
| Morphine | 60 years, female | 200 mg | wrong route of application | coma, muscle cramps | severe |
| Baclofen | adult, male | unknown | overdose | coma, respiratory depression, bradycardia, hypotension | severe |
| Baclofen | 66 years, male | 1 mg | overdose | somnolence | moderate |
| Baclofen | 51 years, male | 4 mg | overdose | clouding of consciousness, dyspnoea, bradycardia, hypotension | severe |
| Methylene blue | 60 years, female | unknown | false indication | tetraplegia, respiratory failure, exitus letalis | severe |

Case report 1

PIC Erfurt 200201201

Patient: 51-year-old man, 70 kg

Anamnesis:

- The patient accidentally received **4 mg (0.06 mg/kg) baclofen** instead of 0,025 mg intrathecally.

Clinical feature:

- First symptoms developed after one hour including **clouding of consciousness, hallucinations, dyspnoea, hypotension, sinus bradycardia**, and flush.

Treatment and course:

- To reduce baclofen concentration in cerebrospinal fluid, a **portion of liquor was withdrawn**.
- The patient was **intubated and ventilated** for 48 hours.
- Cardiovascular symptoms were responsive to the administration of **atropine, dopamine, and dobutamine**, whereas, physostigmine was ineffective.
- After four days the patient was discharged from intensive care unit. He **recovered without sequelae**.

Case report 2

PIC Erfurt 200803067

Patient: 60-year-old woman

Anamnesis:

- Methylene blue was injected intrathecally** to explore a spinal dura defect.

Clinical feature:

- The patient developed **paraplegia, progressing to tetraplegia** a few hours after the injection.
- She had to be intubated because of **respiratory failure**.
- Investigation of **nuclear magnetic resonance (NMR) showed an extended intramedullary signal enhancement in the whole spinal cord up to the medulla oblongata**.
- The liquor was blue-coloured and its protein concentration was extremely elevated.

Treatment and course:

- The patient was given highly-dosed **methylprednisolone** and finally the **lumbar liquor was drained**.
- In the further course, all **brainstem reflexes extinguished** and the **patient died** six days later.



Figure: Findings of the autopsy – Blue discoloration of the whole myelon

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