

## Poisoning with unknown substance, “Munchhausen by proxy”?

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### Summary

An almost 3-year-old boy is admitted to the emergency department in a pediatric hospital. According to his mother, he had vomited blood during the night. During his admission, he became comatose and had to be intubated. After 24 hours he became conscious again and was in relatively stable medical condition. The qualitative urine analysis showed the presence of Baclofen. After a two-week admission, the boy was ready to be released back home. Suspicion of poisoning from either the mother or the father was also a concern (similar to a Munchhausen by proxy case). After several weeks, the mother admitted to having given the boy the Baclofen herself. Four years after hospital admission, the legal aftermath has decided to declare the case as heavy personal injury and not as an attempt to kill. Because the case has some parallels to a “Munchhausen by proxy” syndrome, and this problem is not well known, even under toxicologists, the following introduction illustrates this.

### 1. Introduction. “Munchhausen by proxy”

In 1977, the English pediatrician Roy Meadow published two cases in which mothers had secretly made their children ill [1]. He had made the discovery himself after difficult investigation. In one of the cases, the mother secretly added blood and pus to the child’s urine and this for the duration of six years during which time the child had to endure endless medical examinations. The child was in fact completely healthy. In the second case, a 6-week old infant boy was admitted to the hospital for vomiting and clouding of consciousness. This happened several times, and each time increased sodium values (hyponatremia) was found in the blood. During each hospital stay, the child always recovered well, appeared healthy and thrived normally.

A year later after several of these incidences, the doctors recognized a pattern as these incidences never occurred while the boy was in the hospital. While separated from his mother the boy recovered fully. After an error in reasoning made by the doctors, the boy was handed back to the mother on psychosocial grounds, after which he was re-admitted to hospital in a comatose state and subsequently died. The mother, who was a nurse, had administered the salt to the boy through a stomach tube. Meadow named the clinical picture “Munchhausen by Proxy”, Munchhausen being the term synonymous with the ‘made-up’ stories told by the Baron of Munchhausen, and by-proxy because it is not done to one’s own body but to someone else’s.

### 2. Emergency Admission, Case History

On a Monday morning at 10:50 a.m., an almost 3-year-old boy was brought in by his mother to the emergency department of a children’s hospital. She was desperate and stated that the boy, completely healthy, had suddenly thrown up fresh blood three times around 7:30 a.m. She could not say exactly how much blood. The boy had then become increasingly calm and even apathetic, which is why she decided to take him to the emergency department. The boy

was an otherwise healthy child and did not have any reported infections, coughs or diarrhea during the previous weeks. Accidental intoxication from cleaning agents, medication or other household toxins had not been observed by the mother. According to the mother the boy had been at his father's the previous day; the father and mother are separated, and the father lives with his parents. As a result of a car accident, the father suffers from paraplegia and has been treated with various drugs. He lives alone and manages his life by himself. The parents of the mother's new friend (now her husband) and the father see the child regularly at weekends.

The most important medication was:

- Baclofen (Lioresal): muscle relaxant, spasms of the muscular system from spinal marrow disease, spinal cord injury or MS, inflammation and other medical conditions
- Gabapentin (Neurontin): anticonvulsant, indication as concomitant treatment of partial cramps (adults), pain relief of post-herpetic neuralgia
- Tolterodine (Detrusitol): specific muscarinic receptor antagonist, anticholinergic drug: is mainly used to treat urinary incontinence

### **3. Development, examinations after hospital admittance**

Upon admittance, the boy was in good general health; a blood sample was taken to be certain. The medically relevant laboratory analyses were unobtrusive except for a slightly raised thrombin time (24 sec reference values 13-22) and a weak acidosis two hours after admittance. Fluid was administered (NaCl 0.9%) as a precaution. The laboratory parameters tested referred to the kidneys, liver, heart, respiratory function, acid-bases and electrolyte balance, clotting and glucose. Further examinations such as CT etc. were normal.

During his stay in the emergency department, the boy became noticeably apathetic and fell asleep. The vital parameters are monitored during this time. Two hours after admittance the boy vomited several times, without blood, while asleep. Within a short space of time he became comatose with a GCS of 4-6. He was transferred to the intensive care unit as his condition became critical (EEG showed highly pathological findings). During this period, a urine sample was taken for toxicological testing. It took 24 hours before the boy could be extubated and was able to breathe spontaneously again. Days later he was transferred to the general ward. He was released after 14 days.

### **4. Toxicological Analysis**

Upon admission, the screening via immunoassays for common drugs in urine was negative. Just three days after admission and as a result of several interviews with the mother (during which it should be pointed out that she frequently referred to her ex-husband's medication and thereby causing direct suspicion in his way), the possibility of a medication intoxication could not be ruled out leading to the order the boy's blood the first day of admission to be re-tested (this was, however, no longer available in the hospital). Medications that could have been the potential culprit were Baclofen, Gabapentin, Amitriptyline, Tolterodine.

Amitriptyline was ruled out from the start since the TCA analysis was negative. Regarding the other medications, a rapid validation for new parameters had to be carried out prior to analysis as a supplement to the existing "general target screening" with LCMSMS via reference material from medicine (hospital pharmacy).

Urine from the day of admittance was still available which was forwarded to us after consultation with the patient's general practitioner.

During the conversation, she mentioned that this case might need to be brought to court (for the case of whoever turned out to be the guilty party, to include the possibility not being ruled out of the child having taken medication that was lying around).

The physician was informed that retroactively only a qualitative LC-MSMS urine analysis was possible. The results were: Gabapentin, Amitriptyline, Tolterodine negative, Baclofen positive. No other substances found.

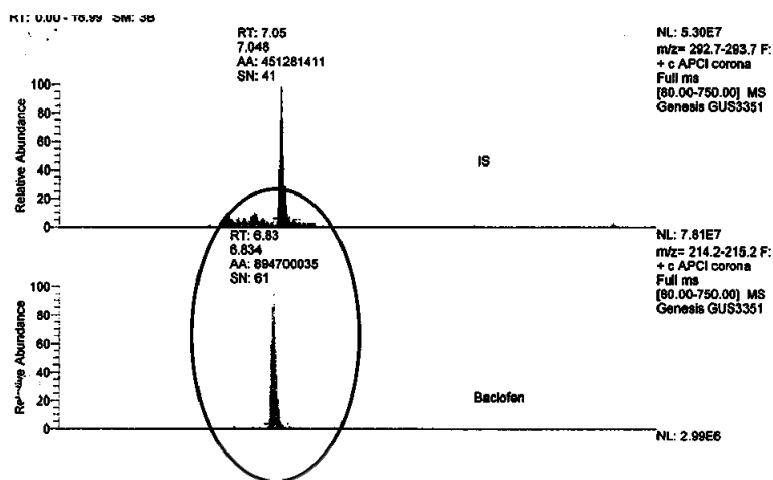


Fig. 1. LC-MSMS of the internal standard (benzoylecgonine; above) and baclofen after library search at RT 6.83 (below).

Weeks later, we were informed by the Institute of legal medicine Basel that a blood sample was received at a later date that was put aside as a reserve on the day of admittance to hospital as a precaution. In this sample, Baclofen was the only substance confirmed to be present (serum concentration 3.8 mg/L).

Tab. 1. Pharmacological parameters and metabolism see [2].

Parameter	Baclofen	Gabapentine	Tolterodine
Proteinbinding (Fraction)	0.3	<0.03	0.96
Vmax (h)	1h (1.2h)	4h	1h
Vmax in mg/L (dose)	0.18 (20 mg), 0.21 (10 mg)	2.2 – 6.1 (400 mg)	0.0019 (2 mg)
Distribution volume (L/kg)	2.6	0.8 - 1.3	1.3 – 1.9
Elimination half time t <sub>1/2</sub> (h)	2 - 8	5 - 9	2 - 3
Therapeutic range (mg/L)	0.08 – 0.6	5.9 – 21.0	approx. 0.002
Toxic range(mg/L)	>1.1	> 85	?

Baclofen Side Effects Toxicity [2]

- Nausea, sedation, dry mouth, dizziness, headache, low blood pressure, general weakness, tremor, sleeplessness
- Withdrawal symptoms after long-term use: hallucinations, agitation, psychoses, hypertension, fever, cramps
- Overdosing: Confusion, dizziness, sleepiness, heart-palpitations, paralyzes, hypothermia, bradycardia, seizures, respiratory paralysis, coma

### Gabapentin Side Effects Toxicity [2]

- Sleepiness, ataxia, dizziness, fatigue, nystagmus
- Other symptoms, especially after long-term use: heart-palpitations; high and low blood pressure; inflammation of the gums, oral mucous membranes, the gastrointestinal tract, tendons, inside the nose or throat; hair loss; etc.
- Overdosing: Confusion, sleepiness, unintelligible speech, lethargy, diarrhea, heart-palpitations, paralyses, hypothermia, low blood pressure, respiratory paralysis, coma

### Tolterodine Side Effects Toxicity [2]

- Headache, dry mouth, constipation, dizziness, sleepiness, visual impairment
- Overdosing: confusion, respiratory insufficiency, tachycardia, urine retention
- Diagnosis: Baclofen intoxication in a comatose state, artificial respiration, suspected poisoning by the mother

## 5. Discharge summary

The discharge summary was: 2-year-, 10-month-old boy in good general health. ENT, cardiac, abdominal, lymph nodes, neurology: unobtrusive, healthy. Diagnosis: Baclofen intoxication in a comatose state, artificial respiration, suspected poisoning by the mother

The boy was discharged after 14 days. After many psychological assessments conducted in the hospital with all members of the family, the boy was temporarily being cared for by the paternal grandmother after agreement of the corresponding civil court. During the ensuing weeks, further meetings took place, and after checking the cause of an earlier hospital stay (three months prior to the current incident), the mother admitted to having given the boy the Baclofen herself.

History of the first incident: The mother brought the boy to the emergency department as he was showing unusual behaviour. She informed the attending ED physician that the boy drank Red Bull and swallowed a pill. Except for mydriasis, the boy did not show any other worrying symptoms and was discharged after a short stay. The urine screening for toxicological substances was negative except for a high amount of caffeine which was identified via HPLC on Remedi from the company BioRad. After the above-mentioned discussions with the attending physician and the suspected case of “Munchhausen by proxy”, we were asked to test any remaining urine that might still be available for further substances. The toxicological follow-up test via LCMS from this urine sample three months later identified: Ritalinic acid detectable (metabolite of the methylphenidate).

## 6. Judicial Aftermath

According to newspaper Information [4,5] the court has decided in the following manner: The mother is guilty for heavy personal injury, failure to render assistance in an emergency situation, false charge (father), but verdict of not guilty for attempt to kill. The verdict was made out partially suspended sentence of 3 years, 1 year of the three custodial sentence, 2 years suspended sentence after a probation period. The child continues to live with the mother. She had committed during a difficult time in her life (divorce, acrimony with the ex-husband, uncertainty with regard to getting custody of the child). Over the past few years, intensive family therapy has successfully calmed the situation and the child is doing well. No further incidents by the mother have occurred.

## 7. References

- [1] Meadow R. Munchhausen Syndrome Boy Proxy; The hinterland of child abuse. *Lancet* 1977;2:343-345.
- [2] Baselt RC. *Disposition of Toxic Drugs and Chemicals in Man*. 9th edition, Biomedical Publications, California, 2011.
- [3] Sturm S, Hammann F, Drewe J, Maurer HH, Scholer A. An automated screening method for drugs and toxic compounds in human serum and urine using liquid chromatography–tandem mass spectrometry. *J Chromatogr B* 2010;878:2726–2732.
- [4] *Basler Zeitung*, Saturday. September 1. 2012, page 36.
- [5] *Basellandschaftliche Zeitung*, Saturday. September 1. 2012, page 28

Additional reference: Gerlach K, Briellmann Th, Dussy F, Hausmann R, Dittmann V. Aus Sorge ums Sorgerecht. *Rechtsmedizin* 2009;19:281.