CASE REPORT

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Amitriptyline Overdose Versus Sudden Infant Death Syndrome in a Two-Month-Old White Female

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ABSTRACT: Death as a result of amitriptyline overdose was diagnosed in a two-month-old white female who was referred as a suspected sudden infant death syndrome (SIDS) case by the local coroner.

KEYWORDS: pathology and biology, amitriptyline, sudden infant death syndrome, death

Death from poisoning or fatal self-ingestion of amitriptyline as well as other tricyclic antidepressants has been reported in the literature [*1-6*], occurring primarily in the older adult population (the 40- to 60-year-old age group), with the youngest reported case occurring in an 8-year-old girl who died 12 h after alleged ingestion of 1.4 g of amitriptyline and 112 mg of perphenazine [*6*]. The case presented here involves perhaps the youngest fatal overdose to date, a 2-month-old white female infant who was referred to our hospital as a probable sudden infant death syndrome (SIDS) death. The purpose of this paper is threefold: to alert pathologists that not only is a thorough examination of the body necessary in suspected SIDS cases but that tissues should be retained frozen for possible toxological studies at the time of the postmortem and any suspicious conditions should be questioned and a thorough investigation requested if necessary.

Case Report

On 4 Oct. 1986, a two-month-old white female infant was referred to Arkansas Children's Hospital for a complete postmortem examination through the State Health Department's sudden infant death syndrome (SIDS) programs. The only information available was that the infant "was not responsive at home," and was therefore taken to the Ozark Medical Center in West Plains, Missouri, where she was pronounced dead on arrival. A "superficial laceration" was noted on the right cheek and the child had reportedly been seen by a local

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physician for an undisclosed illness (date and diagnosis not known). No further information was available from the Coroner at that time. Because of an improper autopsy consent form and the obtaining of a legal permit to transport the body back across state lines, the postmortem could not be performed until 2 p.m. on 6 Oct. 1986. The body, however, had been kept refrigerated.

Received, wrapped in blankets, was the body of a 3725-g white female infant. Routine postmortem radiographs, part of the SIDS protocol, were obtained and showed no evidence of fractures or other pathologic lesions. The external gross examination was remarkable for a 9-mm superficial abrasion located on the right cheek, cyanotic upper extremity nail beds, postmortem artifact drying of the lips, and a greenish discoloration of the abdomen as a result of decompositional changes. No congenital abnormalities were noted, nor were contusions or patterned injuries present. The internal gross examination showed acutely congested and edematous lungs (the right lung weighed 57.0 g, the left 54.0 g) along with petechial hemorrhages on the thymus, subcapsular surface, and the visceral pleural surfaces, bilaterally. These findings were further confirmed on light microscopy. The remaining organs were unremarkable both grossly and on histologic examination.

Also accompanying the body, hidden between blankets, was a clear plastic "baggie" labeled with the deceased's name, "female, particles in mouth, and stuck to airway 10-4-86." This item had not been reported to the State Health Department nor did an emergency room report accompany the body. Within the baggie was an opaque endotracheal tube with adherent as well as loose fragments of bright pink granular material which formed an aggregate measuring 1.0 by 0.4 by 0.2 cm (see Fig. 1). Reexamination of the mouth, larynx, and gastrointestinal tract revealed no further material. Liver and kidney samples were frozen for possible toxicologic studies following identification of the unknown substance by chemical analysis. Because of the postmortem interval only 2 cm^3 of blood was obtained and had been submitted for the bacterial studies as per SIDS protocol. No material was present in the stomach, nor was there urine in the bladder.

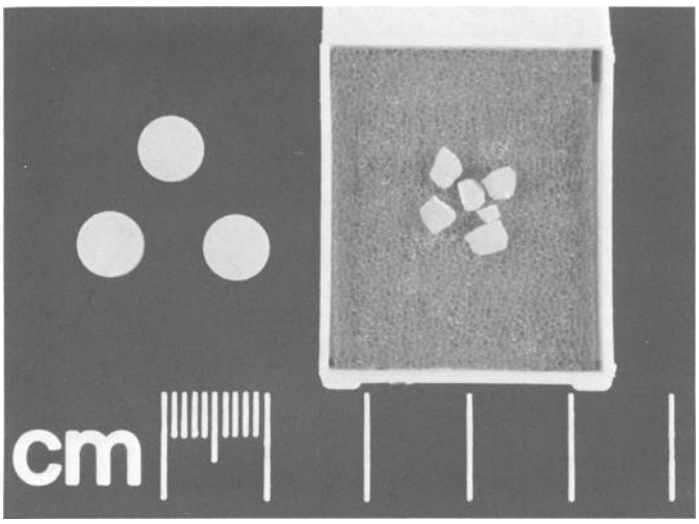

FIG. 1—*Shown within the cassette is 1.0 by 0.4 by 0.2 cm of the bright pink granular material which had been removed from the infant's throat and identified as amitriptyline. The amount suggests that two to three 10-mg tablets (alongside of cassette to the left) had been crushed on the Bible and given to the child.*

After several telephone conversations, it was found that the endotracheal tube within the baggie was placed in the infant's throat and removed by the physician in attendance at the West Plains Emergency Room. It was also learned that the infant was on "no known medications." (This information was not given to the Coroner, which thus resulted in referral to Arkansas Children's Hospital (ACH) for a SIDS postmortem, rather than to the Medical Examiner's Office.)

Following this information, the "pink pill fragments" were assayed both at ACH and at a reference laboratory. The material was identified as amitriptyline. The liver and kidney tissues of the deceased as well as controls were then submitted for analysis and quantitations. The techniques used were protein precipitation, solid phase extraction, and high pressure liquid chromatography (HPLC) quantitation. The identities were confirmed by gas chromatography/mass spectrometry. The liver not only contained 8.7 μg/g of amitriptyline but also contained 1.6 μg/g of its breakdown product nortryptyline. The kidney contained 3.7 μg/g of amitriptyline and 0.7 μg/g of nortryptyline.

With this information, a thorough investigation by the Criminology Division was requested. Following the investigation, it was learned that the household consisted of a pregnant 16-year-old mother, who reportedly had been physically abused as a child, a father, a 3-year-old sibling, and an elderly grandmother who was taking 10- and 50-mg tablets of prescribed amitriptyline.

The young mother finally confessed to taking the grandmother's medication, "crushing the tablets on a Bible and giving them to the infant in order to stop her crying." She stated that she had given the infant the drug before and again shortly prior to her demise. The cause of death was thus determined to be due to an amitriptyline overdose and the manner of death was classified as accidental. These findings have since resulted in the removal of the three-year-old from the home, with placement in a foster home. It was also learned later that the young mother miscarried before the conclusion of the autopsy studies.

Discussion

Amitriptyline HCl, a dibenzocycloheptadiene derivative, is a frequently prescribed antidepressant which has sedative effects; however, because of the lack of experience in children, the drug is not recommended for patients under 12 years of age. Death from poisoning or from fatal self-ingestion by amitriptyline is not rare. On reviewing the literature over the past 20 years [*1-6*], very few publications were found which dealt with postmortem concentrations of amitriptyline in the blood and tissues. These case studies dealt primarily with the older adult population and not the pediatric age group. Only 1 case involved a pediatric patient, an 8-year-old girl who died 12 h after an alleged ingestion of 1.4 g of amitriptyline and 112 mg of perphenazene. The postmortem liver concentrations of amitriptyline were 3.0 mg/dL (30 μg/g) [*6*].

The next youngest aged patient in the literature who died from poisoning with amitriptyline was a 25-year-old male who ingested 1.25 to 2.5 g. His postmortem liver concentration was 1.5 mg/dL (15 μg/g) and his kidney concentration was 0.5 to 1 mg/dL (5 to 10 μg/g) [*4*].

Tissue analysis of liver and kidney in the presented case revealed quantitative levels of amitriptyline and its breakdown metabolite nortriptyline. (Blood, urine, and gastric contents were not available for analysis.) These results suggested that the infant was either exogenously given or had taken amitriptyline. This finally led to a thorough investigation of the family, and to a confession from the mother. Note that a drug screen is not routinely performed, nor considered a part of the SIDS protocol at Arkansas Children's Hospital; it is done only if suspicious findings are noted during the gross examination, or if the history is suspicious and the case has been declined by the Coroner or Medical Examiner or both.

Conclusion

In 1963 Dr. Irving Sunshine reported in *Nature* that "new psychopharmacological drugs brought relief to many patients, but that their misuse could result in misadventures, which could be fatal" [6].

This case report is just such an example. A young mother who noted that "when grandma took her medicine (amitriptyline) she went to sleep," decided to give amitriptyline to her young infant to make her quit crying. This was a fatal mistake.

References

[1] Bailey, D. N. and Shaw, R. F., "Interpretation of Blood and Tissue Concentrations in Fatal Self-Ingested Overdose Involving Amitriptyline: An Update (1978-1979)," *Journal of Analytical Toxicology*, Vol. 4, Sept./Oct. 1980.

[2] Hurst, H. E. and Jarbor, C. H., "Clinical Findings Elimination Pharmacokinetics, and Tissue Drug Concentration Following a Fatal Amitriptyline Intoxication," *Clinical Toxicology*, Vol. 18, No. 1, 1981, pp. 119-125.

[3] Lindstrom, F. D., Flodmark, O., and Gustafsson, B., "Respiratory Distress Syndrome and Thrombotic, Non-Bacterial Endocarditis After Amitriptyline Overdose," *Acta Medica Scandinavica*, Vol. 202, 1977, pp. 203-212.

[4] McBay, A. J., in *Isolation and Identification of Drugs*, Vol. 1, E. G. C. Clarke, Ed., The Pharmaceutical Press, London, 1969.

[5] Munksgaard, E. C., "Concentrations of Amitriptyline and Its Metabolite in Urine, Blood, and Tissue in Fatal Amitriptyline Poisoning," *Acta Pharmacologica et Toxicologica*, Vol. 27, 1969, pp. 129-134.

[6] Sunshine, I. and Baumler, J., "A Fatal Case of Poisoning with Amitriptyline," *Nature*, Vol. 199, 14 Sept. 1963, pp. 1103-1104.

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