

## ACUTE ETHANOL INTOXICATION IN AN INFANT

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(Received January 9, 1989)

### ABSTRACT

A case of acute ethanol intoxication in a 3-month-old female is reported. She accidentally ingested 12.2 g of ethanol (2.1 g/kg of body weight), which is considered to be lethal even in adults. However, she did not present any serious symptoms and rapidly recovered with only supportive care without peritoneal dialysis. She is now 5 years old and has been developing well without any neurological sequelae. This is the youngest of the reported cases of acute ethanol intoxication, suggesting a higher clearance rate of ethanol in an infant than hitherto estimated from adult cases.

Recently, Alexander (1) reported on 27 pediatric patients with ethyl alcohol ingestion ranging in age from 1.5 to 13 years. However, there have been few reports of ethanol poisoning in infants. In adults, several individuals who survived a large consumption of ethanol have been reported on (2, 3). We encountered a three-month old girl who tolerated 80 ml of 16 percent ethanol without any serious clinical manifestations. We have been following her for four years and have found no neurological sequelae and no behavioral problems.

### CASE REPORT

A 3-month-old girl weighing 5.7 kg accidentally ingested 12.2 g of ethanol (2.1 g per kg of body weight) within ten minutes. This ethanol ingestion occurred after her mother mistakenly prepared the baby's milk by dissolving powdered milk in 80 ml of "sake" a 16% ethanol, clear colorless solution. The baby drank all the ethanol-loaded milk within 10 min without vomiting. Thirty min after the ingestion, the mother found that

the baby's face was quite reddish and noticed the mistake. The infant was brought to our hospital.

On arrival at our hospital 70 min after the ingestion, the child seemed well nourished and not drowsy, and she was moving her extremities actively, her breath reeking of alcohol. Her rectal temperature was 37.2°C. Physical findings on admission were as follows: respiratory rate (RR), 60 per min; pulse rate (PR), 140 per min; systolic blood pressure, 110 mmHg. Nasogastric lavage was carried out and yielded gastric juice smelling of alcohol. An intravenous drip infusion of 10% glucose in electrolyte solution was started. The infant soon fell asleep. Physical finding two hours after the ingestion were: RR, 24 per min; PR, 144 per min.

Twelve hours after the ingestion, the infant had fully recovered from the intoxication and was discharged. She has been growing and developing well without any neurological sequelae.

#### DISCUSSION

The toxic effects of ethanol on respiration, heart, brain, and liver of children are not known. In adults, 3 g per kg of body weight and a blood level of 5,000 mg per liter are regarded as lethal (4). In our patient, the amount of ingested ethanol was estimated to be 2.1 g per kg of body weight. It is not clear why the infant did not present any serious clinical manifestations despite the ingestion of such a large amount of ethanol. Recently, Gibson *et al.* (5) reported on a 3-year-old boy who had drunk 14.4 g of ethanol within 30 min, but rapidly recovered with supporting care.

Reviewing the reported cases, we find the outcome for the children is better than expected. The reason for this is considered to be the faster elimination of ethanol from the body, *i.e.*, 0.29 g/l/h in an 18-month-old boy (6), 0.39 g/l/h in a 33-month-old girl (7), and 0.33 g/l/h in a 3-year-old boy (5), faster rates than the values reported in adults, ranging between 0.12 and 0.25 g/l/h (1). These reports and the mild clinical course of our patient suggest that children metabolize ethanol faster than adults. Therefore, the use of active elimination techniques, such as peritoneal dialysis or hemodialysis is not recommended, considering the deleterious effects of these techniques (1). Only supportive management, including intravenous drip infusion to promote renal excretion and to prevent possible hypoglycemia may be satisfactory.

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