

CONSIDERATIONS ON POISONING WITH NITRITES IN CHILDREN

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Abstract

Poisoning with nitrites represents an important problem in the context of childhood poisoning, especially in infants. The purpose of the study was to analyze the cases of poisoning with nitrites in children from Bihor county in the span of 6 years: 2010-2015. The casuistry was represented by six cases of poisoning with nitrites reported during 2010-2015 in Bihor county which were analyzed by demographical, clinical, and evolutive aspects. All the cases were from rural environment; 5 children were 0-1 years of age, 1 was older than 1 year. There were 4 boys and 2 girls. In all the situations, poisoning was produced by using water from fountains in children feeding. Evolution after treatment was favourable. Poisoning with nitrites represents an important problem, especially in rural where water from fountains is used in the preparation of the food.

Key words: children, poisoning with nitrites

INTRODUCTION

Poisoning with nitrites represents an important issue in the context of the poisoning in childhood, especially in infants (age 0-1 years). Mineral oxidants have a common property of producing methemoglobinemia and hemolyse. The majority of the poisonings are accidental. In infants, the most frequent is poisoning with nitrites which is produced by water from fountains which contains more than 100mg/l from these toxic. These children, NO_3 is reduced by intestinal microbiota to NO_2 , with a strong methemoglobinizant effect.

The objective of the study was to analyze the poisoning with nitrites in children from Bihor county in the span of 6 years (2010-2015).

MATERIAL AND METHOD

Casuistry was represented by 6 cases of poisoning with nitrites which have been reported in Bihor county during 2010-2015.

All the subjects were hospitalized. They were analyzed by demographical, clinical, and evolutive aspects. The medical documents were studied and an epidemiological investigation was performed.

RESULTS AND DISSCUSIONS

During the 2010-2015 period there were reported of poisoning with nitrites in Bihor county. All the subjects were from rural enviroment.

The distribution in this period was uniform, in each year one case being detected (table 1).

In 2010, a case was reported in the first trimester from the group of age 0-1 years to a 0-1 years population of 2300 in rural enviroment.

In 2011, another case was detected in the second semester, to a 0-1 years population of 2990 in rural environment.

In 2012, the case reported was in the second semester, to a 0-1 years population of 3185 in rural.

In 2013, the fourth case reported has happened in the second semester of the year, in a rural area, to a 0-1 years population of 3114.

In 2014, a fifth case was found in a 0-1 years population of 2982.

In 2015, the final case was reported in a 0-1 years population of 1103.

Table 1

The distribution during 2010-2015

Year	Number of cases	Group of age	Rural population 0-1 years
2010	1	0-1 years	2300
2011	1	>1 year	2990
2012	1	0-1 years	3185
2013	1	0-1 years	3114
2014	1	0-1 years	2982
2015	1	0-1 years	1103

The socio-economical conditions were low and the level of education of the parents was modest in all of the cases found.

The distribution of the patients' age shows that the majority of the patients were infants with 5 of them being under 1 years of age. In only one case the age of the patient was 2 years (fig. 1).

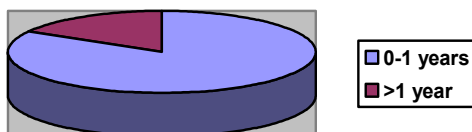


Fig. 1 The distribution of the age

Concerning the distribution of the sex of the patients from the total of 6 patients, 4 subjects were boys and 2 were girls (fig. 2).

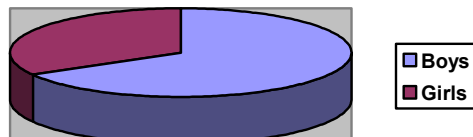


Fig. 2 The distribution of the sex of the patients

All of the poisonings happened by using water from the fountains in preparing the food of the children.

Clinical manifestations consist of cianosis with sudden onset, without pulmonary modifications. Liver and kidney modifications were detected in 2 of the cases. The manifestations were severe in all the situations.

Laboratory findings detected increased levels of methemoglobinemia.

The treatment consisted of administration of 1% methylene blue, high doses of C-Vitamin.

The evolution of the treatment was favourable in all the situations.

The largest source of nitrites in water comes from nitrogen-based fertilizers that get into shallow drinking water wells that are typically in rural areas. Other nitrites may get into water from animal wastes and poor working sewer systems. For infants who are bottle-fed, nitrite poisoning can happen when nitrate contaminated drinking water is used to dilute formula.

Infants younger than 4 months of age are the highest risk group for harm from exposure to nitrites. Because the gastrointestinal system of infants is still developing after birth, they are at higher risk for serious health effects resulting from nitrate exposure.

Our reported cases were acute manifestations. Generally, acute intoxications are manifested primarily by methemoglobin formation (nitrite ion in contact with RBCs oxidizes ferrous iron in Hgb to the ferric state, forming stable methemoglobin incapable of oxygen transport) and resultant anoxia. Secondary effects due to vasodilatory action of the nitrite ion on vascular smooth muscle may occur. The nitrite ion may also alter metabolic

protein enzymes. Ingested nitrates may directly irritate the GI mucosa and produce abdominal pain and diarrhea.

Although usually acute, the effects of nitrite or nitrate toxicity may be subacute or chronic and are reported to include retarded growth, lowered milk production, vitamin A deficiency, minor transitory goitrogenic effects, abortions and fetotoxicity, and increased susceptibility to infection.

CONCLUSIONS

1. Poisonings with nitrites were produced by using water from fountains in children's feeding.
2. The reported cases were exclusively from rural areas.
3. The 0-1 years group of age was predominant.

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