

DEMOGRAPHIC DATA AND PATTERNS OF MUSHROOM POISONING IN CHILDREN

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Keywords: mushroom poisoning, demographics, pattern

Abstract: Mushroom poisoning in children remains a severe disease, potentially fatal in severe cases. The aim of our study is to present the latest data on mushroom poisoning in children in Romania. The study was retrospective, longitudinal, multi-centric. Data were obtained from three Pediatric Clinics (Sibiu, Cluj-Napoca and Bucharest). Of the 146 enrolled patients, 79 were males and 67 females. Patients' age ranged between 0 and 18, with an average of 8.11 + / - 3.44 years. 47 cases (32.19% of total) were cases treated in children of pre-school age, 0-7 years. 72 poisonings (49.32% of total) occurred in children aged 7 to 14 years. 27 poisoning (18.49% of total) were found in the age group 14-18 years. 50 patients were from urban areas and 96 from rural areas. The annual average number of cases of 29.2 + / - 11.8 per year with a maximum of 43 cases in 2010. The minimum incidence was observed in 2011.

Cuvinte cheie: intoxicații cu ciuperci, demografie, mecanisme

Rezumat: Intoxicațiile cu ciuperci reprezintă o patologie severă, cu potențial letal în cazurile grave. Lucrarea de față prezintă date actuale legate de intoxicațiile cu ciuperci la copii în România. Studiul este de tip retrospectiv, longitudinal multicentric. Datele au fost colectate din trei clinici universitare (Sibiu, Cluj-Napoca, București). Din cei 146 de pacienți, 79 sunt de sex masculin și 67 de sex feminin. Vârsta pacienților a fost între 0 și 18 ani, cu o medie de 8,11+/- 3,44 ani. 47 de cazuri (32,19% din total) de intoxicații au fost tratate la copii de vârstă preșcolară, 0-7 ani, 72 de intoxicații (49,32% din total) s-au produs la copii cu vârste între 7 și 14 ani, 27 de intoxicații (18,49% din total) au fost întâlnite la grupa de vârstă 14-18 ani. 50 de pacienți (34%) provin din mediul urban, și 96 (66%) din mediul rural. Media anuală a numărului de cazuri a fost de 29,2+/- 11,8, cu un maxim de 43 de cazuri în 2010. Numărul minim de cazuri a fost înregistrat în 2011.

INTRODUCTION

Mushroom poisoning in children remains a severe disease, potentially fatal in severe cases. Although a series of public education campaigns were carried and media exposure is rather high, especially during periods of increased incidence, the number of cases remains high, with a significant proportion of deaths.

PURPOSE

The aim of our study is to present the latest data on mushroom poisoning in children in Romania. Epidemiological and demographic data are presented on a large group study and we discuss the mechanisms involved in poisoning.

METHODS

The study was retrospective, longitudinal, multi-centric. Data were obtained from: Sibiu Pediatric Hospital (Faculty of Medicine "Victor Papilian" Sibiu) Emergency Hospital for Children "Grigore Alexandrescu" Bucharest (University of Medicine and Pharmacy "Carol Davila" Bucharest), Pediatric Clinic II Cluj- Napoca (University of Medicine and Pharmacy "Iuliu Hațieganu" Cluj- Napoca). Study period was established between January 2009 - June 2013. The collected data were taken from the patient's clinical observation sheets and discharge notes.

The inclusion criterion was the term mushroom poisoning present in the discharge diagnosis

Exclusion criteria were the absence of a diagnosis of mushroom poisoning, patients referred to other centers.

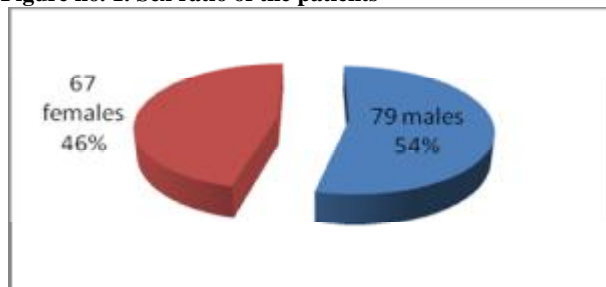
After applying these criteria, a group comprised of 146 cases was created.

The results of the quantitative assessment of the studied parameters were subjected to statistical analysis by the method of selective research assessment of averages and their errors. Authentication studied value differences was assessed by determining the t-Student test with a probability greater than 95% (p < 0,05).

RESULTS

Of the 146 enrolled patients, 79 were males and 67 females.

Figure no. 1. Sex ratio of the patients



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There are no statistically significant differences between the incidence of mushroom poisoning in children according to gender, our study being consistent with the literature

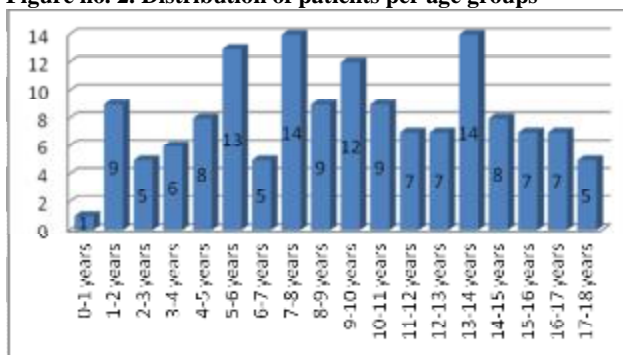
Distribution by age of patients in the study group was as follows:

Table no. 1. Distribution of patients per age groups

Age group	No. of patients
0-1 years old	1
1-2 years old	9
2-3 years old	5
3-4 years old	6
4-5 years old	8
5-6 years old	13
6-7 years old	5
7-8 years old	14
8-9 years old	9
9-10 years old	12
10-11 years old	9
11-12 years old	7
12-13 years old	7
13-14 years old	14
14-15 years old	8
15-16 years old	7
16-17 years old	7
17-18 years old	5

Patient age ranged between 0 and 18, with an average of 8.11 +/- 3.44 years.

Figure no. 2. Distribution of patients per age groups



47 cases (32.19% of total) were cases treated in children of pre-school age, 0-7 years. For this subgroup, the mechanism of poisoning is either accidental ingestion of mushrooms if children are left unattended by caregivers or consumption of mushrooms collected and prepared for shared meals.

72 poisonings (49.32% of total) occurred in children aged 7 to 14 years. In this case the possible ingestion of mushrooms collected from the spontaneous flora, following the example of their parents, but without a good knowledge of their morphology was one of the mechanisms. All the other ways of poisoning remain possible, which explains the highest proportion of cases that fall into this group.

27 poisonings (18.49% of total) were found in the age group 14-18 years. Education is beginning to take a role in this case, therefore poisonous mushroom ingestion occurs rarely, usually by confusion of species.

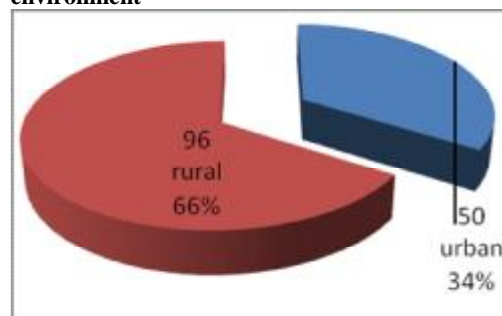
The study by Hatten et al., on a group of over 83,000 cases indicate a percentage of 58.3% of poisoning in children under age of 6.(1) The 2009 Annual Report of the National

Register of poisoning (U.S.) shows that mushroom poisoning in 4083 (73.9%) of the cases were in children, of whom 3012 (54.5%) in group aged 0-6 years, 1071 (19.4%) in the age group 6-19 years, and only in 1230 (26.1%) in people over 19.(2)

The number slightly decreased of cases from pre-school age group compared with the literature can be explained either by a lack of reporting (minor forms that are not recognized and registered as such, cases treated at home or as outpatient)

50 patients were from urban areas and 96 from rural areas.

Figure no. 3. Patients' distribution according to the origin environment



The difference between the two groups is statistically significant, which leads us to say that in our study area of origin of the patients is predominantly rural

It is obvious that most poisonings occur in rural areas. In Romania, the demographic structure of the population is 55.2% in urban and 44.8% in rural areas.(3) However, the number of poisoning is much higher in rural areas, in our study, as in other national studies.(4,5)

The explanation comes from the food habits of the rural population used to collect and consume a range of flora products including fungi. Lack of education and lack of proper morphology knowledge leads to ingestion of poisonous species, with all the consequences deriving from it. Easier access to areas of forest or grassland with fungi facilitates the contact of the rural people with a wide range of mushrooms. Some of these will be kept for their own use, and some may still be sold in markets and fairs, without a checking by specialists. This is one of the common ways of contact with toxins from fungi for the urban population.

The number of cases depending on the year varied is as follows:

Table no. 2. Number of cases by year

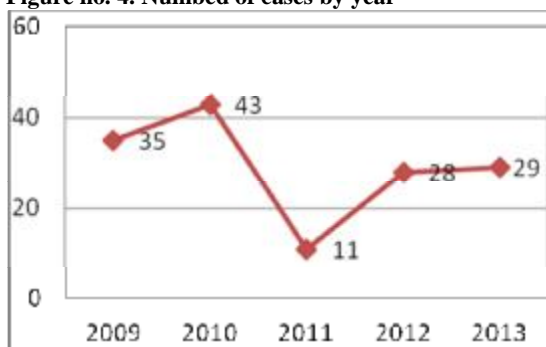
Year	No. of cases
2009	35
2010	43
2011	11
2012	28
2013	29

The annual average number of cases of 29.2 +/- 11.8 per year with a maximum of 43 cases in 2010. The minimum incidence was observed in 2011

Soil water reserve is dependent on the evolution of rainfall and temperature, and is the main determinant of the amount of wild mushrooms that will grow in one specific year. Precipitation recorded at the National Institute of Agricultural Research Fundulea during 2011 totalled 404.4 mm, 131 mm below the annual average.(6) The year 2011 was 0.5 °C warmer than the annual average.

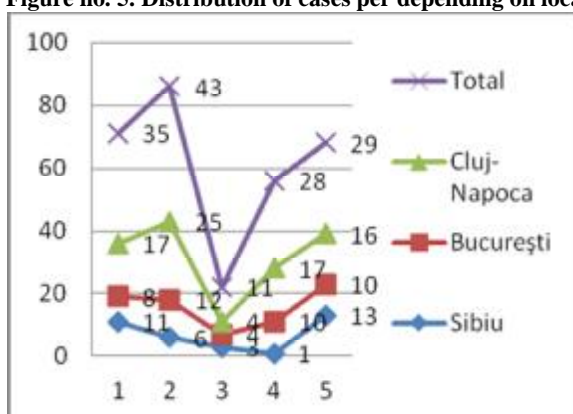
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Figure no. 4. Number of cases by year



The distribution of cases depending on the location was the following:

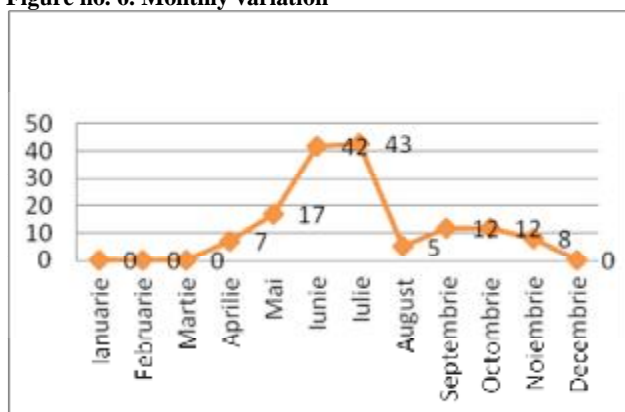
Figure no. 5. Distribution of cases per depending on location



Geographical variation observed respected the annual change in temperature and precipitation, with no statistically significant differences between the number of cases reported in the three centres. Although they are located in different geographical areas as altitude or climate and adjacent landforms, the number of cases was up to the general climatic characteristics of our country

Variation depending on the month.

Figure no. 6. Monthly variation



The number of cases is directly linked to the life cycle of fungi. The June-July, which are the rainiest months and are among the highest as thermal values are the months in which there have been most mushroom poisonings. Together, these two months account for more than half of the cases included in the study (58.22%).

Addressability

Table no. 3. Type of admission

	No. of patients	%
To the hospital/ ER	71	48.63%
By GP / lower rank hospital	75	51.37%

The distribution of cases that were addressed directly to the emergency room of the hospital or were transferred from other hospitals or GPs was approximately equal. Given that in most cases rapid initiation of specific treatment, or in serious cases the use of advanced methods of treatment have a vital influence on prognosis, recognition by primary care professionals of clinical situations with potentially severe outcome (hepatotoxic syndromes, nephrotoxic) is very important.

CONCLUSIONS

There was no significant difference in incidence related to the sex of patients

Patient age ranged between 1 and 18, with an average of 8.11 +/- 3.44 years

47 cases (32.19% of total) were treated in children of preschool age, 0-7 years, 72 poisonings (49.32% of total) occurred in children aged 7 to 14 years, 27 poisonings (18.49% of total) were found in the age group 14-18 years. Education is beginning to take a role in this case, therefore poisonous mushroom ingestion occurs rarely, usually by confusion of species

The area of origin for most of the patients is rural

The peak incidence of cases occurs in the summer months, in years with high quantities of rain and high temperatures.

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