

EPIDEMIOLOGY OF ACUTE EXOGENOUS POISONINGS
IN THE CHILDREN OF RYAZAN REGION

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Aim. The study of the structure of acute poisoning in children in the Ryazan region during 2013–2017 years. **Materials and Methods.** A retrospective analysis of 548 cases of acute poisoning in children in Ryazan region for 2013-2017 years was performed. **Results.** Most often, poisoning occurred in toddlers (35.6%) and adolescents (45.1%). The structure of the etiological factors were medications (45.1%) and unspecified substances (33.6%), alcohol and its surrogates (14.6%). Poisonings with alcohol and smoking mixtures were recorded in adolescents, more often in boys. Poisonings by unspecified medicines were dominated among medicines intoxications (33.6%). Poisonings by nasal decongestants (17.8%), sedatives and hypnotics (13.3%), psychotropic (6.4%), hypotensive (6.8%), non-steroidal anti-inflammatory drugs (NSAIDs) (6.8%) were dominated among specified medicines. Two hundred thirty children had treatment in the department of pediatric resuscitation and intensive care. Poisonings were as a result of an accident in 60.3% cases, suicidal attempts – in 34.3%, overdose of psychotropic drugs in adolescents, who have been using these drugs for a long time (5.5%). Two patients were died as a result of poisoning by wild mushrooms (pale toadstool). **Conclusions.** In the structure of acute poisoning in children of the Ryazan region in 2013-2017 years the most common were intoxication with drugs, unspecified substances, alcohol and its surrogates. Most often, poisoning occurred in toddlers and adolescents. A decrease of rate of toddlers and an increase of adolescents were in dynamics. The rate of alcohol intoxications, mainly in teenagers, increased in 2.5 times.

Keywords: acute exogenous poisoning, children, intoxication.

ЭПИДЕМИОЛОГИЯ ОСТРЫХ ЭКЗОГЕННЫХ ОТРАВЛЕНИЙ У ДЕТЕЙ РЯЗАНСКОЙ ОБЛАСТИ

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Цель. Изучение структуры и динамики острых экзогенных отравлений у детей Рязанской области за период 2013–2017 гг.

Материалы и методы. Проведено ретроспективное исследование 548 случаев острых отравлений у детей Рязанской области за период с 2013 по 2017 гг.

Результаты. Наиболее часто острые экзогенные отравления фиксировались у подростков (45,1%) и детей раннего возраста (35,6 %). Среди причин отравлений наиболее часто выступали медикаментозные препараты (45,1 %), неуточненные вещества (33,6 %), алкоголь и его суррогаты (14,6 %). У детей подросткового возраста преобладали отравления алкоголем и курительными смесями. Независимо от возраста, доминировали интоксикации медикаментозными препаратами, среди которых превалировали отравления неуточненными лекарственными веществами (33,6%), назальными деконгестантами (17,8%), седативными и снотворными (13,3%), психотропными (6,4%), гипотензивными (6,8%) и нестероидными противовоспалительными средствами (НПВС) (6,8%). В интенсивной терапии нуждалось 230 детей, среди которых доминировали отравления в результате несчастного случая (60,3 %), с целью суицида (34,3%). **Выводы.** В структуре острых экзогенных отравлений у детей Рязанской области за период 2013-2017 гг. преобладали интоксикации лекарственными препаратами, неуточненными веществами, алкоголем и его суррогатами. Чаще отравления встречались у детей раннего возраста и подростков. В динамике отмечено снижение количества случаев отравлений у детей раннего возраста и увеличение их числа среди подростков. Отмечен рост числа случаев алкогольных интоксикаций у подростков в 2,5 раза за период наблюдения.

Ключевые слова: острые экзогенные отравления, дети, подростки, интоксикация.

Modern epidemiological studies indicate an increase in the frequency of acute poisonings in children of the different countries in the world [1,2,3]. According to A.A. Baranova (2015), acute exogenous poisonings in the child population in Russia occupies the 3rd place in the structure of

accidents, after the street injuries and burns [4,5].

Data from the American Association of Poisoning Centers show, that in the United States about 1.5 million poisonings occur annually in children and adolescents, which is 67% of the total, of which 53% are in the age category of preschool children.

The cause of about 56% of poisonings in children are the so-called «home» xenobiotics (cosmetics, insecticides, plants and hydrocarbons), 47% - medicines and various chemicals [6,7,8,9]. Acute poisonings with alcohol, smoking mixtures and narcotic substances have increased, especially in adolescent boys in recent years [6,7]. The main reason for this is the availability of alcoholic products with a high content of ethyl alcohol, including substandard and synthetic drugs (spice).

This problem is not only medical, but also socio-economical the provision of medical care and rehabilitation of children in the future requires significant material costs. The prognosis for life in most cases with poisoning is favorable, however, there is often a risk of complications, including

with unfavorable outcomes [4,5,9,10]. Considering the relevance and practical significance of this problem [1,2,3,11,12], the purpose of the study was the analysis of the structure of acute poisoning in children and adolescents of the Ryazan region for the period 2013–2017 years.

Materials and research methods

A retrospective analysis of 548 cases of acute poisonings in children (289 boys, 259 girls) admitted to the pediatric department and the pediatric resuscitation and intensive care unit of the Ryazan City Clinical Hospital No. 11 in 2013-2017 years was carried out (table). The age of patients was from 2 months to 17 years.

Table - Age structure of the examined children with acute poisonings in 2013-2017 years

Age (year)	2013	2014	2015	2016	2017	Total (%)
0-3	44	44	44	30	33	195 (36%)
4-6	9	16	9	17	7	58 (11%)
7-11	8	19	9	8	4	48 (9%)
12-17	28	45	52	65	57	247 (44%)
Total (abs., %)	89 (16%)	124 (23%)	114 (21%)	120 (22%)	101 (18%)	548 (100%)
boys/girls (n/n)	44/45	72/52	54/60	68/52	51/50	289/259

The prevalence, structure, gender and age composition of patients, seasonality, as well as the etiology of acute poisonings in children were assessed. The circumstances of the poisoning were studied on the basis of the analysis of primary medical documentation.

Statistical data processing was performed using the standard Microsoft Excel package.

Results. The largest number of patients with poisonings were recorded in 2014 year – 124 cases (22.6%). Children lived in Ryazan (367, 66.9%) and in Ryazan region (154, 26.5%). Thirty-one patients (5.7%) lived in other regions (Moscow – 22, Lipetsk – 3, Tula - 2, on 1 case - from Tambov, Saratov, Vladimir, Nizhny Novgorod).

Three hundred ninety-five of incidents (72.1%) occurred at home; 27.9% of children used toxic substances on the street and in public places. Four hundred ninety-nine patients (91.1%) were delivered by the ambulance, 38 (6.9%) sought for medical help on their own, 10 (1.8%) were transferred from another medical institution. Any seasonality of hospitalization was not typical.

Analysis of the gender structure of patients did not reveal statistically

significant differences. Poisonings were more often in boys (52.7%). Among the examined patients, poisonings were most frequent in young children (195, 35.6%) and adolescents (247, 45.1%) (fig. 1). It was revealed that with a decrease of rate of toddlers from 49.4% in 2013 to 32.7% in 2017; in the category of teenager (12-17 years old), there was an increase in 1.8 times (from 31.5% to 56.4%, respectively).

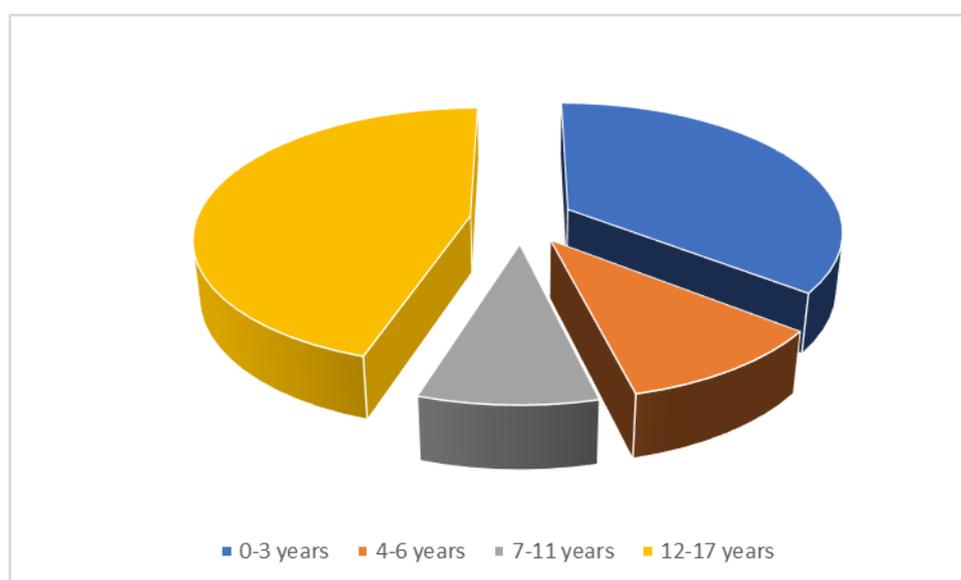


Figure 1. Age structure of patients with acute exogenous poisoning for the period 2013-2017 years.

The largest rate of etiological factors of acute poisonings in children were: drug poisonings – 247 (45.1%), with unspecified substances – 184 (33.6%), alcohol and its surrogates – 80 (14.6%) (fig. 2). The

poisonings with drugs and unspecified means for 2013-2017 years were often too: 117 (45.2%) and 83 (32.0%) in girls and 92 (31.8%) and 93 (32.2%) in boys, respectively.

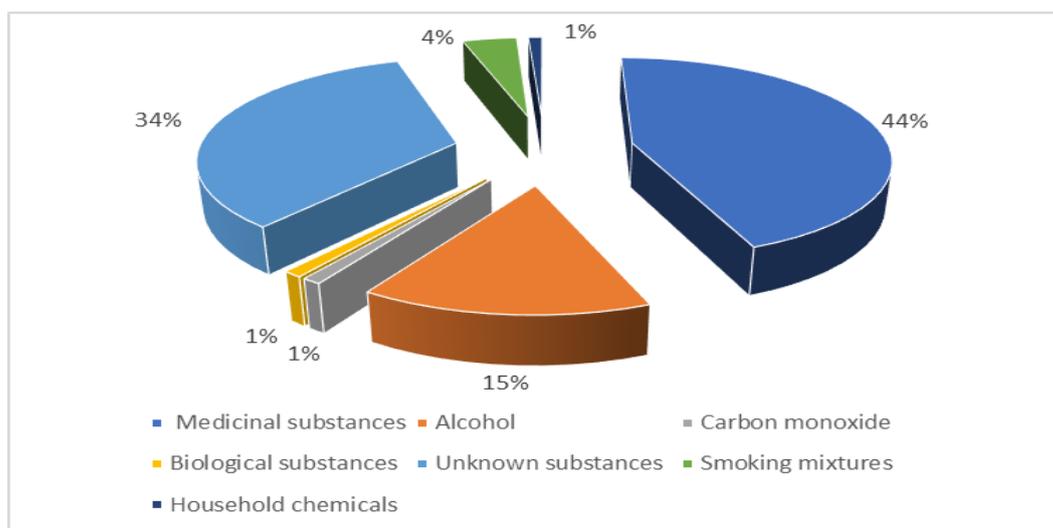


Figure 2. The structure of the causes of exogenous poisoning in children for the period 2013-2017 years.

Poisoning with alcohol and smoking mixtures was recorded in teenagers: 80 adolescents were admitted with alcohol poisonings (32.3%) and 22 – with smoking mixtures poisonings (8.9%). The boys predominated among the patients with these diagnoses: 57 cases of alcohol poisonings (71.3%) and 17 cases of smoking mixture poisonings (77.3%). Most of the poisonings

with smoking mixtures occurred in 2014-2016 years (7 cases annually).

The largest children with drug poisonings were registered in 2015 year – 60 (53% of all patients with poisonings admitted in this year). However, the rate of these poisonings in the structure of all causes of patients with the effect of toxic substances prevailed in 2013 (56%) (fig. 3).

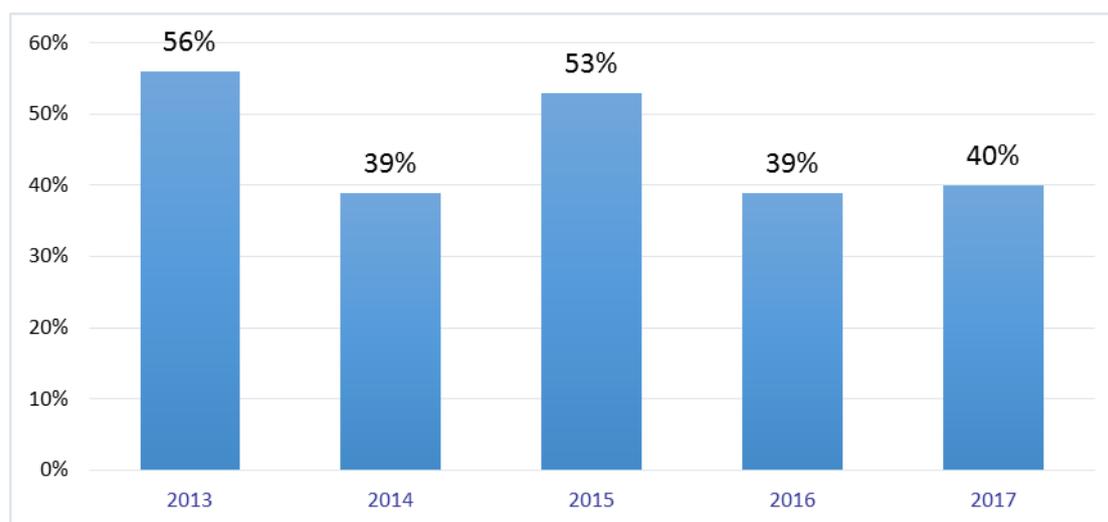


Figure 3. Dynamic of cases with drug poisonings in children (%).

Poisonings with unspecified medicinal substances dominated among the intoxications with medications (83 children,

33.6%), and poisoning with nasal decongestants was most often recorded among the specified medicinal drug – 44

(17.8%), sedatives and hypnotics – 33 (13, 3%), psychotropic – 16 (6.4%), antihypertensive – 17 (6.8%), non-steroidal anti-inflammatory drugs (NSAIDs) – 17 (6.8%).

Under 3 years old children had poisonings with nasal decongestants most often (18.9%), unspecified medications (34, 17.4%), antihypertensive drugs (15, 7.6%). Adolescents had poisonings with unspecified medications (24, 9.7%), hypnotic's (20, 8.0%), psychotropic (10, 4.0%) and non-steroidal anti-inflammatory drugs (9,3, 6%).

Under 3 years old children did not have gender differences in the etiology of drug poisonings. In teenagers with poisonings with hypnotics and antihypertensive medications, non-steroidal anti-inflammatory drugs poisoning was noted in girls and psychotropic drugs - in boys.

The rate of children with alcohol poisonings and alcohol surrogates has increased from 10 in 2014 to 25 cases in 2017. But number of patients with poisonings with unspecified substances has decreased from 55 (44.3%) in 2014 up to 26 cases (25.7%) in 2017. It is indicating an improvement in the quality of diagnosis of acute poisonings in children.

Toxic substances mainly entered the body by enteral route — in 454 cases (82.9%). This required urgent gastric lavage, which was performed in 433 children (79.2%). The exceptions were cases of children with a toxicant exposure time of more than 24 hours. In addition to the enteral route, other routes were also recorded: inhalation (45, 8.1%), intranasal (44, 7.3%), parenteral (5, 1.7%).

Most children were admitted to the hospital in a moderate severity condition – 361 (65.8%). Patients with poisonings with nasal decongestants, alcohol, and smoking mixtures prevailed among them. The main complaints were the lethargy or agitation, vomiting, diarrhea, and abdominal pain. Children had symptoms of drowsiness or agitation, vegetative disorders and gastrointestinal dysfunction.

Every third child (175, 31.9%) was admitted in a severity condition caused by intoxication due to poisonings with hypotensive, psychotropic and antipsychotic substances. These children had dominated the disorders of the cardiovascular system (arterial hypotension or severe hypertension, cardiac arrhythmias), central nervous system (disturbances of consciousness of varying severity, convulsive syndrome), parenchymal organs, which was manifested by changes in the biochemical parameters of blood (increased activity of hepatic transaminases, creatinine, urea and other). Emergency care was provided in the conditions of the pediatric intensive care unit and intensive care; the average length of hospital stay was 5 ± 0.5 days.

Eleven patients (2.3%) were admitted in critical condition. There were children with mushroom poisoning (3 cases), non-steroidal anti-inflammatory drugs poisoning (3 cases) and sleeping drugs (4 cases). The condition of these children was aggravated by the development of a syndrome of multiple organ failure with depression of consciousness up to coma. They had a treatment more than 2 weeks in the Department of Pediatric Resuscitation and Intensive Care.

Total two hundred thirty children (41.9%) had treatment in the children's resuscitation and intensive care unit for the period from 2013-2017 years. There were poisonings as a result of an accident – 139

(60.3%), suicidal attempts – 79 (34.3%), overdose of narcotic and psychotropic drugs in adolescents who have used these drugs for a long time – 13 (5.5%).

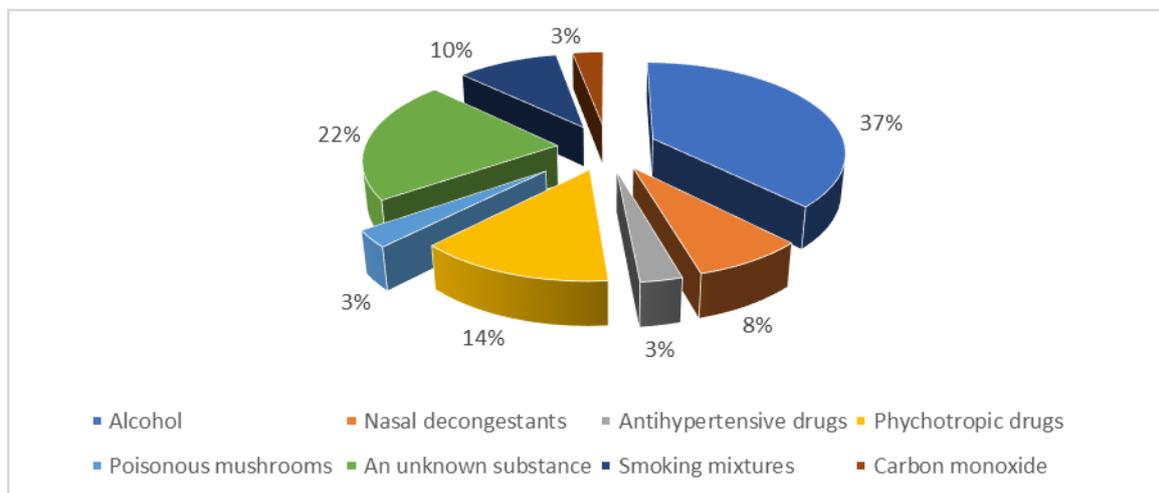


Figure 4. The structure of the acute poisoning in children, who had treatment in the Department of Pediatric Resuscitation and Intensive Care in 2013-2017 years (%).

More than 80% of all suicidal attempts were committed through the use of drugs (non-steroidal anti-inflammatory drugs, tranquilizers, psychotropic drugs, neuroleptic, antihypertensive, antiarrhythmic drugs). Two patients were died as a result of poisoning by wild mushrooms (pale toadstool) in studied period.

Conclusions. The most common were intoxications with drugs, unspecified substances, alcohol and its surrogates in the structure of acute exogenous poisonings in

children of the Ryazan region in 2013-2017 years.

Most often, poisonings occurred in young children and adolescents, with a decrease in the rate of toddlers and an increase in teenagers.

The rate of alcohol intoxication, mainly in teenagers, increased by 2.5 times during the studied period, which is associated with the availability of alcoholic beverages.

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