

© Stoyanova R., Radenkova-Saeva J., 2017
UDC 616.12-008.331.1:615.009
DOI – <https://doi.org/10.14300/mnnc.2017.12070>
ISSN – 2073-8137

ACUTE POISONING WITH ANTIHYPERTENSIVE AND ANTIARRHYTHMIC MEDICINES – CLINICO-EPIDEMIOLOGICAL STUDY

Stoyanova R., Radenkova-Saeva J.

University Hospital for Emergency Medicine «N. I. Pirogov», Sofia, Bulgaria

ОСТРЫЕ ОТРАВЛЕНИЯ АНТИГИПЕРТЕНЗИВНЫМИ И АНТИАРИТМИЧЕСКИМИ ПРЕПАРАТАМИ. КЛИНИКО-ЭПИДЕМИОЛОГИЧЕСКОЕ ИССЛЕДОВАНИЕ

Р. Стоянова, Я. Раденкова-Саева

Университетская больница скорой медицинской помощи им. Н. И. Пирогова, София, Болгария

The characteristics of acute poisoning with antihypertensive and antiarrhythmic medicines were investigated in the retrospective epidemiological study. All cases of antihypertensive and antiarrhythmic medicines (AAM) poisoning were analyzed for 3 years period. Demographic data, previous illness were obtained retrospectively. The cases of poisonings were evaluated with respect to clinical course, therapy and outcome. 896 patients with acute exogenous intoxications were treated. 136 cases (15.2 %) of them were poisoning with AAM – beta-blockers, calcium channel blockers, angiotensin converting enzyme inhibitors, etc. 95 (69.9 %) were female and 41 (30.1 %) male, between the ages of 18 and 98. 61 individuals (44.9 %) were poisoned by only one drug. In 75 (55.1 %) remaining cases, intoxications were mixed, including other different medications or psychoactive substances. 112 cases (86.8 %) were intentional – a result of a suicide attempt. The severity of poisonings varied from moderate to extremely severe. In 17 patients poisoning occurs with the signs of exotoxic shock, 3 of them – with fatal outcome. In the examined group three patients died of cardiogenic shock and secondary acute respiratory failure resistant to therapy. In conclusion, patients with acute poisoning from AAM were a large proportion of all patients, received acute poisoning and represent a serious challenge for the physician – toxicologist.

Keywords: acute poisoning, antihypertensive, antiarrhythmics medicines

Изучены особенности и структура острого отравления антигипертензивными и антиаритмическими препаратами (ААП). В ретроспективном эпидемиологическом исследовании анализировались 896 случаев острых отравлений больных, в течение трёх лет госпитализированных в клинику. Всего проанализировано 136 (15,2 %) случаев отравлений ААП (бета-блокаторами, блокаторами кальциевых каналов, ингибиторами ангиотензин-превращающего фермента и др.). Женщин было 95 (69,9 %), мужчин – 41 (30,1 %), возраст обследованных колебался от 18 до 98 лет. У 61 (44,9 %) больного были зафиксированы отравления только одним препаратом, в 75 (55,1 %) оставшихся случаях интоксикация была смешанной, включала другие лекарственные средства или психоактивные вещества. В 112 (86,8 %) случаях приём препаратов был преднамеренным – как результат попытки самоубийства. Тяжесть отравлений варьировала от умеренной до крайне тяжелой. У 17 пациентов отравление происходило с признаками экзотоксического шока (у 3 из них – с летальным исходом). Причина смерти была связана с кардиогенным шоком и вторичной резистентной к терапии острой респираторной недостаточностью. Таким образом, пациенты с острым отравлением от ААП представляют серьезную проблему для врача-токсиколога.

Ключевые слова: острое отравление, антигипертензивные и антиаритмические препараты

Modernizing of contemporary style of living – sedentary way of life, unhealthy nutrition, low health culture of the population and some other factors have led to rise of rhythm disturbances and progression of arterial hypertension (AH) more often at young age as well. Such are the results of Framingham study, which included 3900 healthy people, observed for a 10-year period [3, 10]. At the recommendations of the European hypertension association, respectively the European cardiology society, there has been emphasized that monotherapy lo-

wers effectively arterial pressure with a small number of patients. There must be a combination of at least two types of medicines to be achieved control under heightened pressure. For more comfort at the market there are fixed in one tablet antihypertensive combinations (FC) of two (more rarely of three) medicines, most often one of them is a diuretic [1, 2, 4, 6, 8].

Modern antihypertensive FC contain different but mutually complementing one another in the mechanism of action of the medicaments which leads to a bigger effectiveness and lower prices of them. They are recom-

mended as very good for treatment of AH with certain proofs from several large studies for the biggest benefit in reduction of undesirable extreme cardiovascular events. Nowadays medical practice has at its disposal unimaginable great number of antihypertensive and diuretic means, allowing refinement at combining of single representatives. In this way is reached not only maximum antihypertensive effect but also favourable outcome of all complications, connected with the disease [5, 7, 9].

Antihypertensive medicines are a mixed group, including diuretics, blockers and beta-adrenergic receptors /beta-blockers/, blockers of alpha-adrenergic receptors, calcium antagonists, inhibitors of angiotensin converting enzyme (ACE inhibitors) sartans, centrally effecting sympatholytics, vasodilating medicines, ganglioblocking means.

At the market there appeared a lot of various commercial names of most of the generic antihypertensive medicaments. Most of them are at acceptable prices, widely used in medical practice and same are well known to patients. They often become means for self-poisoning, used by both healing patients as well as their relatives. The various commercial names of one and the same generic medicament lead to unintentional mistakes. Prolongation of patients' lives and progress of atherosclerotic processes are also prerequisites for overdosage and intoxications.

Aim of the investigation: study of the characteristics of acute poisoning with antihypertensive and antiarrhythmic medicines.

Material and Methods. In a retrospective epidemiological study, all cases of antihypertensive and antiarrhythmic medicines (AAM) poisoning were analyzed for 3 years period. Demographic data, previous illness were obtained retrospectively. The cases of poisonings were evaluated with respect to clinical course, therapy and outcome.

Criteria for inclusion of the cases was patients over 18 years old with confirmed diagnosis, treated in the Toxicology Clinic of UMHATEM «N. I. Pirogov» in the period from 2011 to 2013. Monitoring of blood pressure and heart rate were performed. There has to be at least one ECG record.

Results and Discussion. In the period from January 1st, 2011 to December 31st 2013, totally 896 patients with acute exogenous intoxications were treated in the Toxicology Clinic, Department for adults, UMHATEM «N. I. Pirogov», Sofia, Bulgaria. 136 cases (15.2 %) of them were poisoning with AAM – beta-blockers, calcium channel blockers, angiotensin converting enzyme inhibitors, etc. (Fig. 1).

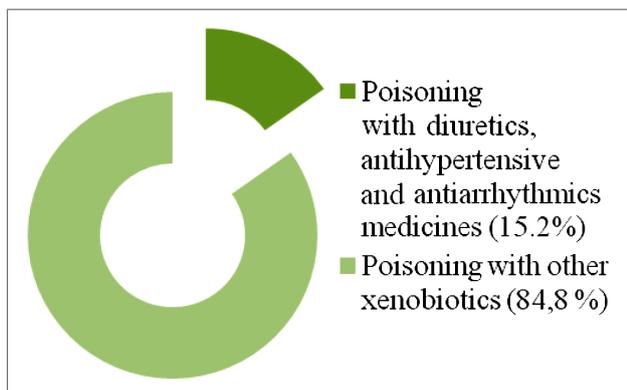


Fig. 1. Distribution of poisoning according to type of xenobiotics (relative share)

Ninety five people (69.9 %) were female and 41 (30.1 %) male, between the ages of 18 and 98 (Fig. 2, 3).



Fig. 2. Distribution by gender

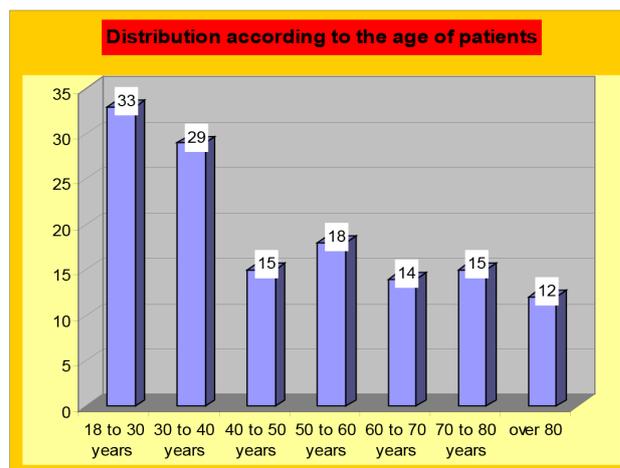


Fig. 3. Distribution according to the age (N)

Sixty one (44.9 %) individuals were poisoned by only one drug. In 75 (55.1 %) cases, intoxications were mixed, including other different medications or psychoactive substances. 18 patients had taken also antidepressants, 10 – benzodiazepines, 12 – alcohol, 7 – antibiotics, 8 – antipyretics, 7 – nonsteroid resolvents, 5 – antidiabetes medicaments, 4 – cardiac glycosides, 7 – nitrates, 6 – statins, histamines, protectors of the gastric mucosa, mucolytics, immunomodulators and other medicaments (Fig. 4).

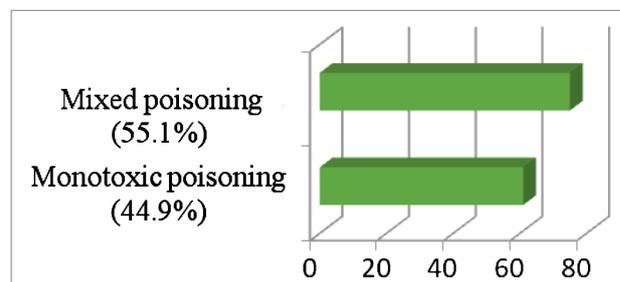


Fig. 4. Distribution according to type of intoxication

23 patients had taken four and more than four medicaments. In 112 (86.8 %) cases poisonings were intentional – as a result of a suicide attempt. 11 patients had taken a higher dose of drugs on alcohol background. 5 patients with atherosclerotic changes had used repeatedly the daily dose of the prescribed medicaments. 4 patients had taken antihypertensive medicaments from one and the same group but with different commercial names. Four patients had been taking medication by mistake (Fig. 5).

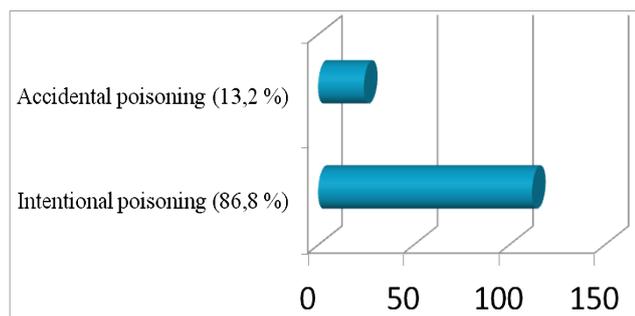


Fig. 5. Distribution according to the reason for poisoning

The severity of poisonings varied from moderate to extremely severe.

In 17 (12.6 %) patients, poisoning occurred with signs of exotoxic shock, three of them with fatal outcome. Two of the dead patients until the 12th hour after their receipt in hospital, and the third one (a female) – on the sixth day of entrance. Mortality rate was 2.2 %.

The patients, admitted to the hospital a short time after the incident, are most often with not completely manifested clinical picture. In patients, entering at hospital later after the incident, the clinic picture is manifested to the fullest extent.

66 people were admitted in the hospital with normal indices of arterial pressure. ECG data show the following: 52 patients were with bradycardia, 18 – with tachycardia, 4 – with AV block I degree. There were 12 patients with paroxysmal atrial fibrillation and 7 people were with extrasystoles. 43 patients were with normal ECG records (Fig. 6).

The patients were treated in the hospital from several hours to 14 days. Prolonged hospitalization is often determined by complications. Seven patients were with inflammatory pulmonary changes, two others were with pulmonary edema.

The treatment of AAM patients starts with depuration of the gastrointestinal tract. Replacing corrective therapy

include electrolyte and glucose solutions, HAES sterile 10 % or 15 %, according to the values of blood pressure and central venous pressure (CVP).

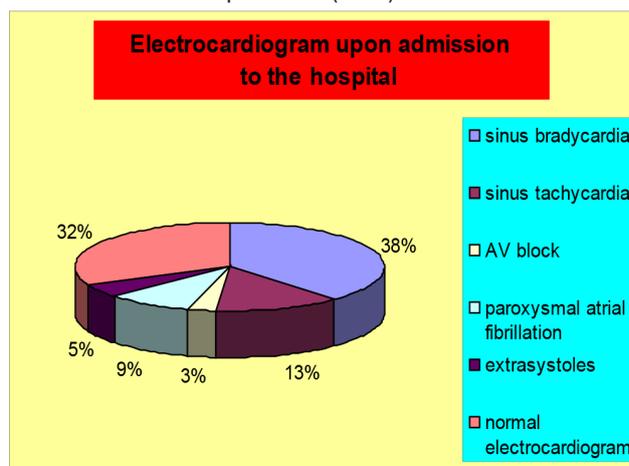


Fig. 6. Changes in electrocardiograms

In patients with tachycardia, non-selective beta blocker is administered (most often propranolol hydrochlorid with the lowest possible dose, achieving therapeutical effect).

When it is impossible to normalize the arterial pressure applying infusion solutions, there must be used catecholamine support. In patients with bradycardia parasympatholytics (atropine sulphate) is administered.

If necessary, it can be administered oxygen ventilation, antibiotics, anticoagulants, gastric mucosa protectors and other symptomatic medication. In cases of extreme bradycardia should be placed a temporary cardiostimulator.

Conclusions. Patients with acute poisoning from AAM were a large proportion of all patients, received acute poisoning and represent a serious challenge for the physician – toxicologist.

References

1. Bulgarian Hypertension League. ESH/ESC Guidelines for the management of arterial hypertension. Recommendations for behavior in arterial hypertension in clinical practice, 2013.
2. Dasgupta K., Quinn R., Zarnke K. [et al.] The 2014 Canadian Hypertension Education Program Recommendations for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension. *Can. J. Cardiol.* 2014;30:485-501. doi: 10.1016/j.cjca.2014.02.002
3. Franklin S., Pio J., Wong N. [et al.] Predictors of new-onset diastolic and systolic hypertension: the Framingham Heart Study. *Circulation.* 2005;111:1121-1127.
4. Glusseppe Mancia G., Frang R., Narkiewicz K. [et al.] 2013 ESH/ESC Guidelines for the management of arterial hypertension. The Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *J. Hypertens.* 2013;31:1281-1357. doi: 10.1097/01.hjh.0000431740.32696.cc
5. Grassi G., Cifkova R., Laurent S. [et al.] Blood pressure and cardiovascular risk profile in hypertensive patients from central and eastern European countries: results of the BP-CARE study. *Eur. Heart J.* 2011;32:218-25. doi: 10.1093/eurheartj/ehq394
6. James P., Oparil S., Carter B. [et al.] 2014 Evidence-based guidelines for the management of high blood

- pressure in adults. Report from the panel members appointed to the Eight Joint National Committee (JNC 8). *JAMA.* doi: 10.1001/jama.2013.284427
7. Law M. Use of blood pressure lowering drugs in the prevention of cardiovascular disease: a meta-analysis of the 147 randomised trials in the context of expectations from prospective epidemiological studies. *BMJ.* 2009;338:b1665. doi: 10.1136/bmj.b1665
8. Mancia G., Fagard R., Narkiewicz K. [et al.] 2013 ESH/ESC Guidelines for the management of arterial hypertension. The task force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *Eur. Heart J.* 2013;34:2159-2219. doi: 10.3109/08037051.2014.868629
9. Rosendorff C., Black H., Cannon C. [et al.] Treatment of hypertension in the prevention and management of ischemic heart disease: A scientific statement from the American Heart Association Council for High Blood Pressure Research and the Councils on Clinical Cardiology and Epidemiology and Prevention. *Circulation.* 2007;115:2761-2788.
10. Vasan R., Beiser S. A., Seshadri S. [et al.] Residual lifetime risk for developing hypertension in middle-aged women and men: The Framingham Heart Study. *JAMA.* 2002;287:1003-1010.

About authors:

Radenkova-Saeva Julia, MD, PhD, ERT, Associate professor, Medical Doctor of Clinic of Toxicology; tel.: +359899853428; e-mail: jrjaeva2@yahoo.co.uk

Stoyanova Rayna, MD, PhD, Professor; tel.: +359899853428; e-mail: jrjaeva2@yahoo.co.uk