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Shock in Patients Treated in the General Clinic of Internal Diseases, the Medical Academy in Lublin in the Years 1979—1988

Wstrząs u chorych leczonych w latach 1979—1988 w Klinice Ogólnej Chorób Wewnętrznych Akademii Medycznej w Lublinie

Шок у больных находящихся на лечении в 1979—1988 гг. в общей терапевтической клинике Медицинской Академии в г. Люблине

Shock is, as before, among one of the most serious pathologic states threatening patient's life in spite of considerable progress in its treatment in the recent ten years (1, 2, 13).

The immediate causes of shock may be a dicrease of cardiac output, increase of volume of vascular bed or interaction of them both. Dicrease of cardiac output may result from defective heart ability to contract or dicrease venous blood flow to the heart (3, 7, 15).

Dicrease of stroke volume and cardiac output result in defective blood flow through all tissues and lead to metabolic acidosis, whose intensity is decisive for prognosis (4, 7, 15, 16).

Goals

The goal of the study was a retrospective analysis of causes, frequency of occurrence and clinical course of shock in patients hospitalized during ten-year period in the clinic of internal diseases.

PATIENTS AND METHODS

In the General Clinic of Internal Diseases, the Medical Academy in Lublin 11442 patients where hospitalized in the years 1979—1988. 519 patients (3%) developed shock: among them there were 239 men and 280 women, age range, 23 to 98 years, with a mean age of 71.

Shock diagnosis was based on generally accepted criteria.

As a rule patients in shock were treated in intensive care units in the clinic. The applied treatment was compatible with generally accepted principles (6, 9, 12).

According to the causes the following types of shock were distinguished: cardiogenic, resulting from generalized artheromatosis, oligovolemic, metabolic (hyper- and hypothyroidism and diabetes), septic, and resulting from other diseases (neoplasm, chronic diseases of the kidneys, liver, and collagenoses (3, 4).

Within these sub-groups the following parameters were evaluated: patient's age, clinical course of shock, results of treatment, and death rate. Other factors as concentration of urea and potassium in the blood plasma and hematocrit were considered as well.

The material was analyzed statistically by means of *t*-Student's test. Values $p<0.05$ were accepted as statistically significant. Mean values were given together with the standard error (*SE*).

RESULTS

Fig. 1 presents the frequency of occurrence of the particular types of shock in relation to their causes. Fig. 2 illustrates the causes of cardiogenic shock. Figs. 3 and 4 give mean values of urea and hematocrit respectively. Concentration of potassium (K^+) in the blood plasma in all patients with shock ranged from 2.7 to

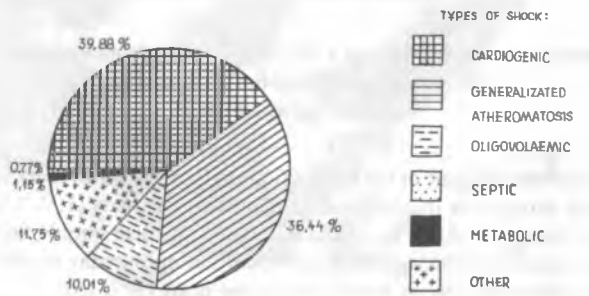

Fig. 1. Reasons of shock in patients treated in department of Internal Diseases Medical Academy in the years 1979—1988

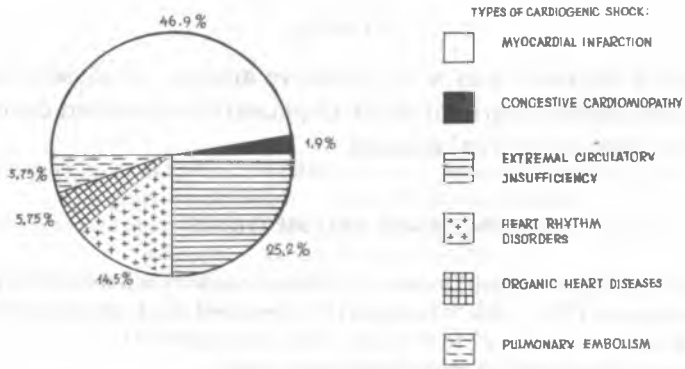

Fig. 2. Reasons of cardiogenic shock in patients treated in department of Internal Diseases Medical Academy in the years 1979—1988

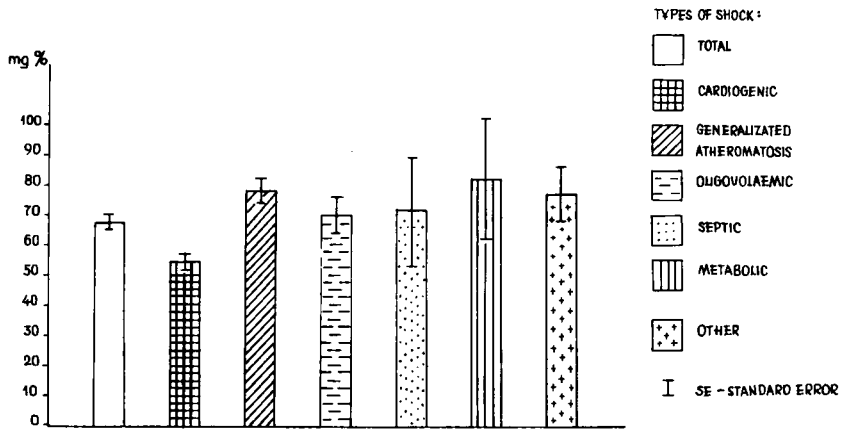

Fig. 3. Mean values of urea in patients with different types of shock treated in department of Internal Diseases Medical Academy in the years 1979—1988

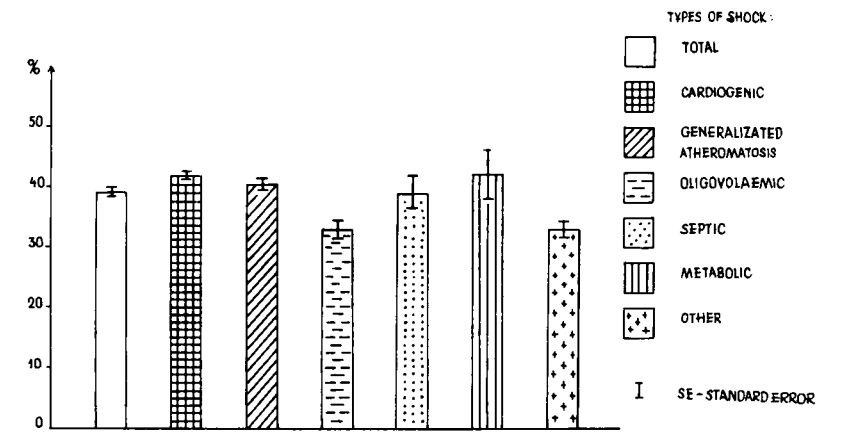

Fig. 4. Mean values of haematocrit in patients with different types of shock treated in department of Internal Diseases Medical Academy in the years 1979—1988

7.6, mean 4.5 mEq/1. Shock developed in 519 patients (3.0%) who were hospitalized, 20 patients (3.9%) survived (16 men and 4 women) 499 patients (96.1%) died.

From among the group of 207 patients in cardiogenic shock 17 patients (8,2%) survived, including patients with acute myocardial infarction.

Among the group of 744 patients with acute myocardial infarction who were hospitalized during the discussed period 97 (13.0%) developed shock. Shock resulted from the anterior wall infarction in 48 cases (49.5%), from the inferior

wall infarction in 31 cases (31.9%), from apical infarction in 15 cases (15.5%), and from lateral wall infarction in 3 cases (3.1%) cases.

Myocardial infarction developed for the first time in life in 67 patients (69.1%) and in 30 patients (30.9%) was a subsequent one.

Among the patients in shock caused by myocardial infarction in 37 (38.3%) cases shock was the first infarction symptom, i.e. it occurred as a shocking form of infarction, while in 60 patients (61.7%) is developed later.

Death rate in cardiogenic shock was 91.8%. If shock resulted from myocardial infarction then it was 88.7%

Metabolic shock gave 83.4% mortality, 1 patient (16.6%) with thyrotoxicosis was cured.

From among 52 patients in oligovolaemic shock 2 patients (1,9%) survived. In one patient shock was caused by accute pancreatitis in the course of cholelithiasis and in the other patient by acute infectious inflammation of the intestines. Death rate in this shock type was 98.1%

Treatment failed in all patients in septic shock type, in the shock following generalized artheromatosis, and in the group of patients in other shock type.

To sum up, retrospective analysis proved that shock developed in 3.0% of patients, 20 patients (3.9%) were cured. Total death rate in shock was over 90%. The lowest was noticed in myocardial infarction shock (88.7%) and the highest (100%) in shock caused by generalized artheromatosis, septic, metabolic, and the one resulting from chronic diseases of the kidneys, liver, collagenoses, and neoplasm.

COMMENT

In the accessible literature we have not come across papers treating simultaneously various types of shock that occur in the clinic of internal diseases, hence the comparison of our results to the others was not possible on the whole. Yet, there are many publications concerning cardiogenic shock.

Żochowski et al. (17) analyzed cases of cardiogenic shock in the course of myocardial infarction. Death rate among the patients was closer to the one observed by us and was 91%. Prognosis was considerably worsened by the disorders of the heart rhythm found in over 67% of cases, which was as well found in our material. However, the frequency of shock occurrence was not influenced by localization of myocardial infarction and the time when hospitalization of patients with myocardial infarction was begun.

Chlebus et al. (5) in their discussion of occurrence and prognostic importance of myocardial infarction complications state that cardiogenic shock had 84% death rate among men and 100% among women. In our studies we observed similar values.

The study by Korewicki et al. (10) may also be quoted to underline the role of the heart rhythm disorders in worsening prognosis for patients in cardiogenic shock.

In our patients prognosis in shock following myocardial infarction was worsened by: pulmonary oedma, disorders of the heart rhythm or disorders of the transmission of stimuli (especially ventricular fibrillation), past myocardial infarction, advanced age and female sex. The mortality percentage among patients with shock caused by myocardial infarction is closer to the one observed by other authors (2, 12, 13).

Mortality in cardiogenic shock following accute myocardial infarction was found in our studies lower than in cases of shock caused by other factors than infarction. This may be due to the creation of intensive care medical centres giving treatment first of all to the patients with accute myocardial infarction. Hemodynamic bed-side monitoring (taking such parameters as left and right ventricular filling pressure, arteriography, measuring heart output by thermodilucive method), two-dimentional echocardiography of the heart, coronary and aortal angioplasty, intra-aortal contrapulsation belong to modern diagnostic and therapeutic methods applied in some cardiological centres in treatment of myocardial infarction and shock highten prognosis to a certain extent (2, 6, 9); unfortunatelly, in many centres they are inaccessible.

Higher mortality caused by other types of shock than cardiogenic may be explained by often generalized and chronic character of *sub finem vitea* diseases which have led to the shock, which is not rare.

In recently quoted publications on cardiogenic shock mainly, we meet reports about lower than observed by us mortality. Yet these studies concern patients hospitalized in recent years and the result is determined by the entrance of new diagnostic and therapeutic methods. Perhaps relatively high mortality observed by us in comparison with other authors in due to long retrospective period studied in comparison with the development of treatment methods is subsequent years.

The present study attempted at the evaluation for prognostic reasons of such parameters as: age, hematocrit, concentration of urea and potassium in the blood plasma of patiens in different types of shock.

To the oldest belonged the patients with shock in the course of generalized artheriomatosis, the youngest were in septic and cardiogenic shock. The mean age of patients in shock caused by generalized artheromatosis was significantly higher in comparison with the group in cardiogenic shock, oligovolaemic, and other types of shock. Thus the advanced age was the factor worsening prognosis.

Hematocrit values were characteristically significantly higher in patients with cardiogenic shock and shock following generalized artheromatosis in comparison to oligovolaemic shock and the group in other types of shock (Fig. 4). Thus

hematocrit may have a certain importance in treating patients in shock and for prognosis, for which there are also data in other publications (8).

The highest mean values of urea in the blood plasma were found with patients in shock following metabolic diseases, and the lowest in case of cardiogenic shock. The difference was highly significant statistically (Fig. 3). This may be the evidence for usually normal kidneys function prior to cardiogenic shock; and the evaluation of higher urea values in metabolic shock should be more careful as they may result from other than kidney damage.

Concentration of potassium in the blood plasma within all groups of patients in shock presented normal limits.

The analysis of patients in various type of shock during many-year period allows the statement that shock in the clinic of internal diseases is still a serious complication of many diseases, burdened with high mortality.

Conclusions

1. Shock in the clinic of internal diseases is a serious complication that occurs in about 3% of hospitalized patients.
2. Mortality in shock is very high as it ranges from 88% to 100% depending on the basic disease,
3. Cardiogenic shock was the most frequently observed type, then subsequently come oligovolemic, metabolic, septic and shock caused by other reasons such as: neoplasm, chronic diseases of the kidneys and liver, and collagenoses.
4. Prognosis in shock is worsened by advanced age, subsequent myocardial infarction, disorders of the heart rhythm, pulmonary oedema as well as female sex.
5. Results of shock treatment depend on the type of the disease and the time when the treatment was instituted.
6. Evaluation of hematocrit and concentration of urea in the blood plasma may be useful in treatment and prognosis of shock.

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STRESZCZENIE

Przeprowadzono retrospektywną analizę przyczyn, częstości występowania oraz wyników leczenia wstrząsu u chorych hospitalizowanych w Klinice Chorób Wewnętrznych w okresie 10 lat. Wyodrębniono następujące postacie wstrząsu: kardiogenny, w następstwie uogólnionego procesu miażdżycowego, oligowolemiczny, metaboliczny, septyczny oraz w następstwie innych chorób.

Wstrząs rozwinął się u 519 chorych (3,0%), w tym u 239 mężczyzn i 280 kobiet w wieku 23—98 lat, średnio 71 lat. Wstrząs kardiogenny stwierdzono u 207 chorych (39,9%). Najczęstszą jego przyczyną był świeży zawał serca. U pozostałych chorych przyczynami wstrząsu kardiogennego były: krańcowa niewydolność krążenia, zaburzenia rytmu serca, wady zastawkowe serca, zator tętnicy płucnej i kardiomiopatie. Śmiertelność u wszystkich hospitalizowanych chorych wynosiła ponad 90%. Najniższą zanotowano we wstrząsie zawałowym (88,7%), w pozostałych postaciach śmiertelność była wyższa.

Z przeprowadzonej analizy wynika, że wstrząs jest ciężkim powikłaniem wielu schorzeń internistycznych. Wyniki leczenia zależą od rodzaju choroby i czasu rozpoczęcia leczenia. Rokowanie pogarszają: podeszły wiek, kolejny zawał serca, zaburzenia rytmu serca, obrzęk płuc, płeć żeńska.

РЕЗЮМЕ

В настоящей работе подвергнуто ретроспективному анализу причины, частоту развития, а также результаты лечения шока у больных госпитализированных в клинике внутренних болезней в период 10 лет. Выделены следующие виды шока: кардиогенного, в результате генерализованного атеросклеротического процесса, олиговолемического, метаболического, септического, а также в результате других заболеваний.

Шок развился у 519 больных (3,0%), среди них у 239 мужчин, и у 280 женщин, в возрасте 23—98 лет, т.е. средний возраст 71 год. Кардиогенный шок был выявлен у 207 больных (39,9%). Самой частой причиной его был свежий инфаркт миокарда. У остальных больных причинами кардиогенного шока были: предельная недостаточность кровообращения, нарушения ритма сердца, клапанный порок сердца, эмболия легочной артерии и кардиомиопатия. Смертность госпитализированных больных равнялась более 90%. Самая низкая отмечена при инфарктных шоках (88,7%), при остальных формах смертность была выше.

Из проведенных исследований видно, что шок является тяжелым осложнением большинства терапевтических заболеваний. Результаты лечения зависят от вида заболевания и времени начала лечения. Прогноз ухудшают: пожилой возраст, каждый следующий инфаркт миокарда, нарушение ритма сердца, отек легких, женский пол.