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Research Article

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Characteristics of First Aid Types for Pelvic Trauma in Women Injured During Local Military Conflicts

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AIM OF STUDY To assess the types and scope of first aid for pelvic injuries in women in conditions of local military conflict.

MATERIAL AND METHODS To achieve this goal, an analysis of injuries received during local military operations carried out in the Republic of Chechnya from 1991 to 2000 was carried out. The treatment was carried out on the basis of the surgical hospital of medical organization No. 9 in Grozny. The severity of the injury was determined retrospectively using the Field Surgery Scale, distinguishing four degrees of severity. Injured patients with combined injuries to the chest, abdomen, and head were excluded. The average age of patients was 34 [28; 40] years. The total number was 86.

RESULTS As the study shows, group A included 54 (62.8%), and group B included 32 (37.2%) patients. The distribution by group is presented as follows: in group A, 44 (51.2%) shrapnel wounds, 10 (11.6%) gunshot wounds. In group B, there were, respectively, 25 shrapnel (29.1%) and 7 gunshot (8.1%) wounds. Further analysis showed that penetrating wounds predominated, which were observed in 67 (77.9%) cases, non-penetrating wounds were only revealed in 19 (22.1%) cases ($r = 0.97$, $p < 0.05$, statistically significant). Distribution by groups: in group A there were 48 (55.8%) and 6 (7.0%), respectively, in group B there were 19 (22.1%) and 13 (15.1%) observations. Anti-shock measures, which include pain relief and infusion therapy, were carried out in 31 (36.0%) cases in group A and in 5 (5.8%) cases in group B ($r = 0.97$, $p < 0.05$, statistically significant). At the same time, in the group of patients where first aid was provided by random witnesses or as self-help, the number of errors was 27 (31.4%) cases out of 29 (33.7%) observations.

CONCLUSION The analysis showed that measures aimed at providing first aid to wounded females in the pelvic area were fully provided by medical teams, and no errors were revealed in the implementation of these measures, which indicates the good training of emergency doctors.

Keywords: first aid, pelvic injuries in women, gunshot wounds, armed conflicts

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INTRODUCTION

The problem of injury resulting from gunshot wounds does not lose its relevance today. Penetrating injuries of the pelvic organs are a serious problem, with an overall mortality rate of 21% [1]. The highly polymorphic and specific nature of this injury, often in combination with damage to several internal organs, makes this type of injury particularly complex [2–4]. The urgency of the problem is made by the fact that gunshot wounds can lead to damage to various organ systems, as a result of which these injuries require an interdisciplinary approach to their treatment. According to data presented by V.V. Vlasov [5], most victims of gunshot wounds die without waiting for the arrival of medical workers, therefore, providing first aid to injured people in the first minutes after receiving injuries is of very high importance for saving human life and health. The study of the pathology of gunshot wounds of the pelvic girdle and pelvic organs will be far from complete if gunshot wounds of the pelvic area in women are left without proper coverage. Gunshot wounds of the female genital organs are among the rarest cases not only in peacetime, but also in wartime [6–8]. The rarity of gunshot wounds of the internal genital organs in women can be explained by the anatomical location of the uterus and appendages deep in the pelvis and their protection by the pelvic bones.

Aim of study: to assess the types and volume of first aid for pelvic injuries in women in local armed conflict.

MATERIAL AND METHODS

To achieve this goal, an analysis of injuries received during local military operations that took place in the Republic of Chechnya from 1991 to 2000 was carried out.

The study is retrospective and continuous. The criteria for inclusion in this group were the presence of a gunshot wound in the pelvic area, both multiple and single, and age over 18 years. Wounded patients with combined injuries to the chest, abdomen and head were excluded. The average age of the wounded was 34±6 years. The total number of wounded was 86 people.

Treatment was carried out on the basis of the surgical hospital of medical organization No. 9 in Grozny. Medical histories, accompanying sheets from ambulance station No. 114/u, if available, and forensic medical examination protocols were used as primary documentation.

The severity of the injury was determined retrospectively using the BFS-T (Battlefield Surgery Scale for Trauma) scale [9], distinguishing four degrees. Injury severity scores were: 1 for mild, 2 for moderate, 3 for severe, and 4 for extremely severe injury. The assessment of the severity of the condition of the wounded upon admission to a medical organization using the "BFS-upon admission" scale [9] in patients was carried out retrospectively, based on the medical history.

When describing shock, a three-degree classification was used. Clinical examination of the wounded included, first of all, an assessment of their general condition. We took into account the degree of consciousness, the color of the skin and mucous membranes, neurological status, indicators of external respiration (its character, respiratory rate) and blood circulation (heart rate, arterial and central venous pressure).

To describe the data obtained in the work, the terminology recommended by the dictionary "Concepts and Definitions of Disaster Medicine" was used. This dictionary was developed by the All-Russian Center for Disaster Medicine "Zashchita" (1997). Based on it, such a term as "emergency" from a medical point of view was assessed as a situation that arose as a result of the disaster. As a consequence of this disaster, there would be victims who would require emergency medical care.

However, such assistance would require significant changes in the methods of everyday work. A mass admission was considered to be the arrival of 3 or more wounded people with gunshot wounds at the same time. To evaluate the provision of first aid, the following criteria were put forward: who provided the first aid, the volume and timing of its provision.

Taking into account the fact that the course of the immediate postoperative period and the further development of complications and deaths are influenced by several factors, one of which is the period that elapsed from the moment of injury to the start of surgery, all the wounded were divided into two groups: A – wounded, those admitted up to 1 hour after injury and B – wounded patients admitted more than 1 hour after injury.

Permission to conduct the study was obtained from the local ethics committee of the Reaviz Medical University. All studies were carried out after explaining the purpose and objectives of the study and obtaining patients' permission to participate in the study, which was confirmed by written consent. In order to perform mathematical processing of the results that were obtained during the study, the results were initially entered into an electronic database located on the computer. All data obtained for each person examined was entered into the database. This database was a card index in a tabular form in *Excel format*. After entering the data into the database, the results were analyzed using the descriptive statistics method. The goodness-of-fit criterion χ^2 was used as a criterion. Statistical significance was defined as $p < 0.05$. To establish correlations, the nonparametric Spearman test (r) was used. The correlation coefficient is interpreted based on the level of connection strength: r >0.01–0.29 – weak positive connection, r >0.30–0.69 – moderate positive connection, r >0.70–1.00 – strong positive connection.

RESULTS

As the study shows, group A included 54 (62.8%), group B – 32 (37.2%) wounded. When comparing the data obtained, it was found that the number of wounded in group A was statistically significantly higher than in group B ($r = 0.78$, $p < 0.05$). When assessing the nature of injuries to the pelvic organs, it was found that splinter wounds predominated, which were recorded in 69 cases (80.2%), bullet wounds were identified only in 17 cases (19.8%). The distribution by group was as follows: in group A, shrapnel wounds – 44 (51.2%), gunshot wounds – 10 cases (11.6%). In group B, there were 25 (29.1%) and 7 (8.1%) cases, respectively. From the presented data it is clear that the number of wounded with gunshot wounds predominated in group A. Further analysis showed that penetrating wounds predominated, which were noted in 67 (77.9%) cases, non-penetrating wounds occurred only in 19 (22.1%) observations (r=0.97, p <0.05, statistically significant). The distribution by subgroups in group A was 48 (55.8%) and 6 (7.0%), respectively, and in group B – 19 (22.1%) and 13 (15.1%) observations.

As the analysis shows, first aid to the wounded in this situation was provided both by medical workers and bystanders or the victims themselves. At the same time, first medical aid as pre-medical aid was provided by paramedic teams of emergency medical services (EMS), and first medical aid was provided by EMS doctors. In the presented material, pre-medical assistance was provided in 23 observations (26.7%), first medical assistance – in 34 (39.1%), and self- and mutual assistance – in 29 cases (33.7%). The distribution of types of first aid provided to the wounded of the two groups is reflected in Table 1.

Table 1

Types of first aid provided

Type of first aid	Number in groups			
	A		B	
	n	%	*n*	%
Self- and mutual assistance	2	2.3	27	31.4
First aid	21	24.4	2	2.3
First aid	31	36.0	3	3.5
Total	54	62.8	32	37.2

From those presented in table 1 data shows that in group A such types of assistance as pre-medical and first medical assistance predominated, which was provided in 52 observations (60.5%), while in group B self- and mutual assistance predominated – 27 (31, 4%). In group A, self- and mutual assistance was provided in only 2 (2.3%) cases, while in group B, pre-medical and first medical aid was provided in 5 (5.8%) cases.

Of the total number of wounded outside the medical organization, they performed the following measures: wound dressing, wound treatment – in 82 cases (95.3%), pain relief – in 36 cases (41.8%),

catheterization of a peripheral vein and infusion therapy in as anti-shock measures – in 36 (41.8%) cases. Distribution data events by groups is presented in table 2.

Table 2

The main measures provided in two groups for injuries to the pelvic area outside a medical organization

Type of first aid	Number in groups			
	A (*n* =54)		B (*n* =32)	
	n	%	*n*	%
Wound dressing, wound treatment	54	62.8	28	32.5
Peripheral vein catheterization and infusion therapy	31	36.0	5	5.8
Pain relief for everything of which narcotic analgesics non-narcotic analgesics	31 19 12	36.0 22.1 13.9	5 – 5	5.8 – 5.8

As can be seen from the data reflected in table 2, the main type of care provided to the wounded of both groups included wound treatment and bandaging. Anti-shock measures, which include pain relief and infusion therapy, were carried out in 31 (36.0%) cases in group A and in 5 (5.8%) cases in group B (r =0.97, p <0 .05, statistically significant).

The correctness of first aid is of interest, as this affects the further course of the postoperative period for such victims. As the analysis shows, out of the total number of wounded, such assistance was provided competently, timely and in full in 52 observations (60.5%). Of these, EMS medical teams – in 34 observations (39.5%), and paramedic teams – in 18 observations (20.9%). At the same time, errors in the provision of such assistance were noted in 5 observations (5.8%), in all cases when provided by paramedic teams, among which the most common was incorrect performance of temporary hemostasis, which led to ongoing bleeding. Moreover, in the group of wounded people for whom first aid was provided by random witnesses or as self-help, the number of errors was 27 cases (31.4%) out of 29 observations (33.7%). All errors were associated with incorrect performance or failure to perform hemostasis. Only in 2 (2.3%) observations could the implementation of first aid measures be characterized as timely and provided in full.

Thus, the analysis showed that measures aimed at providing first aid to female wounded in the pelvic area, in the form of medical care, were carried out in full by medical teams, and no errors were recorded in the implementation of these measures, which indicates good preparation EMS doctors. The results obtained when providing first aid by SPM paramedic teams turned out to be somewhat worse. At the same time, when providing first aid by bystanders or as self-help, the largest number of errors were identified.

Upon admission of such wounded to the medical organization, it was revealed that the distribution of injury severity according to the BFS-T scale was as follows: mild injury – 23 people (26.7%), moderate – 12 wounded (13.9%), severe – 32 (37.2%) and extremely severe injury – 19 (22.1%) people. The severity of the condition of the wounded upon admission to the medical organization on the BFS-upon admission scale corresponded to the severity of the injury. When analyzing the severity of the injury and the severity of the condition of the victims at the time of admission in two groups, it was found that in group A at the time of admission the following results were obtained: mild injury - 19 people (22.1%); medium trauma - 11 wounded (12.8%); severe injury – 18 (20.9%) and extremely severe injury - in 6 (6.9%) cases. In group B: mild injury – 4 (4.6%) (r =0.86, p <0.05) people; average injury – 1 wounded (1.2%) (r =0.88, p <0.05); severe injury – 14 (16.3%) (r =0.82, p <0.05) and extremely severe injury – 13 (15.1%) (r =0.89, p <0.05) (differences statistically significant in all cases). From the presented data it is clear that in group B, the wounded with severe and extremely severe trauma predominated, which, accordingly, generally led to aggravation of the condition of the victims. At the time of admission, shock was registered in 31 wounded (36.0%), of which in group A – in 12 wounded (13.9%), and in group B – in 19 (22.1%) (r = 0. 84, p <0.05, statistically significant) person. The distribution by degree of shock was as follows: I degree – 15 people (17.4%), of which in group A - 10 (11.6%), and in group B – 5 (5.8%); II degree – 6 (6.9%), respectively, in group A – 2 (2.3%), and in group B – 4 wounded (4.6%); III degree – 10 (11.6%). When the wounded were admitted to the hospital, it was found that in the vast majority of cases – 67 (77.9%) the blood loss was 500 ml, in the remaining 19 (22.1%) cases it exceeded 700 ml.

It should be noted that all wounded in the immediate postoperative period were prevented from developing purulent-inflammatory complications; for this purpose, penicillin antibiotics were used, which were administered

intramuscularly, starting from the first postoperative day. As an analysis of the course of the immediate postoperative period shows, with such wounds complications arose in 27 (31.4%) cases, of which in group A – in 10 cases (11.6%), and in group B – in 17 cases (19. 8%) (r =0.87, p <0.05, statistically significant). In the overwhelming majority of observations, both in group A and group B, complications were purulent-septic in nature. Overall mortality was 26 people (30.2%), of which in group A – 8 people (9.3%), and in group B – 18 (20.9%) (r = 0.92, p < 0.05, statistically significant) person. Causes of death include traumatic shock and peritonitis.

DISCUSSION

Unfortunately, in the modern world there is no reduction in the level of global threats, which leads to the emergence of various local armed conflicts, the victims of which are the civilian population. There is no doubt that the outcome of an injury depends on many factors, one of which is the correctness, timeliness and sufficient scope of first aid at the scene of the incident. It is necessary to take into account the fact that in most cases, during a local armed conflict, logistics are disrupted, medical institutions are destroyed, and there is a shortage of medicines and qualified medical personnel [10]. Injury to the pelvic area in women is a fairly serious problem, since this is where the reproductive organs are located. The analysis showed that measures aimed at providing first aid to female wounded women in the pelvic area in full medical quality were carried out by medical teams, while no errors were registered in the implementation of these measures, which indicates the good training of EMS doctors. The results obtained when providing first (medical) aid by EMS paramedic teams turned out to be somewhat worse. At the same time, when providing first aid by bystanders or as self-help, the largest number of errors were identified. This, in turn, influenced the course of the immediate postoperative period. Thus, as a result of the study, it was found that for patients who received first aid in a timely manner, within one hour from the moment of injury and in full, the incidence of complications and deaths was statistically significantly lower. The average length of hospitalization for such wounded was 12±3 days.

CONCLUSION

Based on the analysis of the results and errors obtained, we propose the following algorithm for providing assistance for such injuries, which includes:

1. Assessing the source and intensity of external bleeding, performing temporary hemostasis.

2. Assessing the general condition, performing adequate pain relief regardless of the severity of the pain syndrome; administration of analgesics (opioids).

3. Regardless of the severity of the condition, perform peripheral vein catheterization and infusion therapy.

FINDING

1. Of the total number of wounded, first aid was provided competently, timely and in full in 52 observations (60.5%). Of these, EMS medical teams – in 34 observations (39.5%), and paramedic teams – in 18 observations (20.9%). At the same time, errors in providing such assistance were noted in 5 observations (5.8%), in all cases when provided by paramedic teams. However, in the group of wounded people (group B), for whom first aid was provided by bystanders or as self-help, the number of errors was 27 cases (31.4%) out of 29 observations (33.7%).

2. When analyzing the severity of the injury and the severity of the condition at the time of admission in two groups, it was found that in group B, the wounded with severe – 14 (16.3%) (r = 0.82, p <0.05) and extremely severe injuries predominated – 13 (15.1%) (r =0.89, p <0.05) was statistically significant in both cases, which, accordingly, led to aggravation of the condition of the victims.

3. It was found that for patients who received first aid in a timely manner, within one hour from the moment of injury and in full, the number and frequency of complications and deaths were statistically significantly lower: in group A – 8 people (9.3%), in group B – 18 (20.9%) (r =0.92, p <0.05, statistically significant) people.

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