

Siege of Town and Establishment of Field Hospital

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ABSTRACT

Introduction: The degree of material and social development determines the basic characteristics of warfare. There are various causes, means and goals of warfare. From the standpoint of international war law, significant is the division between international and non-international (civil) war. International law of war is a part of public international law and constitutes a set of contractual and legal rules governing the relations between the international recognized subjects in times of armed conflict. The town of Konjic and Konjic municipalities are geographically located in the northern part of Herzegovina–Neretva Canton. It is the largest urban municipality in the state of Bosnia and Herzegovina. Distance to some settlements in the northeast to the northwest or the villages are 186 km. Municipality area is 1,101 km². According to the character of the mountainous districts, inhabited by a sparse population, which amounts to 29.65 people per 1 km². A third of the population lives in the city and suburbs, and the other two-thirds is the rural population. **Goal:** Our aim was to show that in an environment, space, under the conditions imposed suddenly by all sorts of war blockade, the successful in transformation from peacetime to war organization, with full support to local personnel and material-technical resources can be achieved successful results. **Material and methods:** This research was conducted as a clinical, descriptive and retrospective, by valid documentation of War Hospital and already published thesis on a series of conferences, symposia and seminars at home and abroad. In this paper we show our results achieved in the care and treatment of injured and sick hospitalized in the War Hospital Konjic for the period from April 1992 till December 1995. **Results and discussion:** Of the total number of hospitalized at the surgical ward, 62% had an injury, a disease had 30.7%. Dominated by war injuries (78.9%). The total mortality in the surgical ward was 4.5%. By localization were most often represented injuries of the extremities (52.1%), followed by chest (22.4%), stomach (13.4%), head and neck (12.1%), and multiple wounds (10.4%). In case of extremity injury in 64% of cases it was a case of fracture of the bone and the skeleton, and 19.5% had an injury of the neuro-vascular structures. In case of injuries to the abdomen, usually it was a case of open injury (95%). **Conclusion:** War Hospital, in many cases of illness and injury, due to the proximity of combat operations, and all manner of constant blockade, uniting all four echelons of health care by war-surgical doctrine. Start the application of the doctrine of original beginning of the admission, triage departments and ending at the other hospital departments with definitive cure in 90% of cases. In the meantime, patients went through all the stages (diagnosis, resuscitation, surgical treatment, conservative treatment, isolation, etc.).

Key words: war hospital, siege, organization.

1. INTRODUCTION

War is a social phenomenon that accompanies the whole history of mankind. War is nothing but an extension of politics by force (1).

The degree of material and social development determines the basic characteristics of warfare. There are various causes, means and goals of warfare. From the standpoint of international war law, significant is the division between international and non-international (civil) war. International law of war is a part of public international law and constitutes a set of contractual and legal rules governing the relations between the international recognized subjects in times of armed conflict.

Under international law the war is prohibited. By explicit legal prohibition of war started in the 1928, when 15 countries signed Briand-Briand Pact. By the beginning of World War II to this pact joined 63 countries. Briand-Briand Pact is, unfortu-

nately, from the very beginning relativized, since many countries during its ratification manifested different reserve (2).

After the tragic experience of the Second World War, the international community has paid special attention to the preservation of peace and the prevention of, not only the war, but also all other forms of use of force in resolving international disputes. It is specifically enshrined in the Charter of the United Nations (UN), in which the first goal of the United Nations states: "To maintain international peace and security and to take effective collective measures" (2).

Member countries of the UN, undertake to resolve their international disputes by peaceful means, and these are the reasons why under the Charter of the UN are developed different mechanisms to resolve international disputes. Significant role in the protection of international peace and security have different regional and other organizations, which are primarily

NATO, OSCE and many others.

Under the unauthorized use of armed force are: aggression, unlawful military intervention and armed reprisals.

“Aggression is the use of armed force by a State against the sovereignty, territorial integrity or political independence of another State, or the use of armed force, which is in any other manner inconsistent with the Charter of the UN” (2)

Bearing in mind all of the above, it is clear that the war in Bosnia and Herzegovina since 1992 till the end of the 1995, had the character of an international conflict with all the elements of aggression.

Bosnia and Herzegovina after the breakup of the former Yugoslavia acquired its international recognition, after which became a member of the UN, as a sovereign state from March 1, 1992. Shortly thereafter started the aggression and war is declared in June 1992 and lasted until the peace agreement signed in Paris on December 14 1995.

The health care system, as well as its level of development, significantly affecting the concept of defense and its efficiency.

The town of Konjic and Konjic municipalities are geographically located in the northern part of Herzegovina–Neretva Canton. It is the largest urban municipality in the state of Bosnia and Herzegovina. Distance to some settlements in the northeast to the northwest or the villages are 186 km. Municipality area is 1,101 km². According to the character of the mountainous districts, inhabited by a sparse population, which amounts to 29.65 people per 1 km². A third of the population lives in the city and suburbs, and the other two-thirds is the rural population.

Until the war in the Konjic municipality lived a total of 43,878 inhabitants (1991). During the war, there have been changes in the demographic structure (refugees, displaced, persecuted and those who have left on their will this space), so that the population at the end of the war amounted to 32,197 inhabitants (1995), of which the number of refugees and others was 10,360.

Health services in the municipality of Konjic until the war was offered by health workers in the Primary Health Care Centre in Konjic (DZ Konjic), organized by the then Health Care Act, the primary and secondary health care, organized exclusively through specialist–polyclinic work, maternity ward and dispensary.

By April in 1992 in DZ Konjic, worked a total of 251 employees, of which 25 specialist doctors, 27 general practitioners, 114 nurses, and the rest was the technical staff. At the beginning of the war, especially in its first year, there was a massive outflow of personnel of all profiles, so that DZ personnel remain almost halved. Remained a total of 30 doctors, of which 17 specialists, 13 general practitioners and 49 nursing staff.

Until the war, all insured, or the entire population from the territory of the Konjic municipality, all their, more serious, outpatient (both diagnostic as well as therapeutic) services, especially hospital services, received in two adjacent center (Mostar and Sarajevo).

Space, equipment, staff and especially for any surgical procedure did not exist, nor have we prepared for it.

In the military tactics of warfare, no matter of which type, there is a premise that in the terminology says: “surround and destroy”. As a way of taking cities, this tactic is known since ancient civilizations, and the Trojan War is a typical example. The aggressor has used this tactic to urban areas, separating

them from the free territory.

War-surgical doctrine was made during the care for war injuries. All the peaceful organization of existing health services, to its full capacity was subordinated to wartime events and put into full operation care.

The largest part of the war, or the entire duration of aggression, a municipality of Konjic was completely blocked, without any possibility of communication with the larger centers. For these reasons, the organization and operation of health services was fully autonomous, in simple terms, fully supported on our own strength. We had no help at all in any sense. Paramedical and technical staff that are essential were recruited from own sources. We invited students and high school students (technicians, economists, masters, hairdressers, high school students ...) for help. All they have gained during the work necessary, basic medical knowledge. It is important to emphasize that all these workers after the war, after opening a medical school in Konjic, had the opportunity to gain a degree of medical workers (nurses, obstetricians and laboratory technicians), which large number of them also achieved.

Heart of war hospital was war surgery. However, unlike previously known war hospitals, thus formed had a war hospital and other departments and support services for the diagnosis and treatment of patients of all ages and all pathology (children, internist, urology, pulmonary, gynecological–obstetric and other cases).

With all of the above, no-one ever forgotten preventive work to protect the health of children, adolescents and pregnant women.

While working in the field hospital, the whole team in the management of war injuries and treatment of patients was using methods that are scientifically based, with the use of many improvisations that ranged into this framework.

2. GOAL

Bearing in mind the important fact, that in this manner formed and organized War Hospital, in a fully surrounded area, was the first and last stage in the care and treatment of patients/injured, we have tried to analyze the treatment of hospitalized for the entire war period.

Our aim was to show that in an environment, space, under the conditions imposed suddenly by all sorts of war blockade, the successful in transformation from peacetime to war organization, with full support to local personnel and material-technical resources can be achieved successful results.

3. MATERIAL AND METHODS

This research was conducted as a clinical, descriptive and retrospective, by valid documentation of War Hospital and already published thesis on a series of conferences, symposia and seminars at home and abroad.

In this paper we show our results achieved in the care and treatment of injured and sick hospitalized in the War Hospital Konjic for the period from April 1992 till December 1995.

During this period, we are in the newly created War Hospital handled injuries of anatomical structures, as well as surgical diseases (acute and chronic).

The study is retrospective, longitudinal, largely descriptive and partly manipulative, controlled and clinical.

Injured card, containing information about the procedure

with the wounded before hospitalization, and for hospitalized wounded data can be found in the history of illness. Before start of the study (the arrival of the wounded), are defined procedures in the care of the wounded at all stages, from admission to leaving the institution, which is adhered to the whole team until the end of the research period.

All data from the war medical records were entered into a database, from which data was then used and statistically analyzed.

4. RESULTS

In the War Hospital Konjic during war period of three and a half years (from April 1992 till December 1995), was treated of a total of 7153 patients/injured. Of this number, there were 2,717 (38%) males and 4334 females (62%).

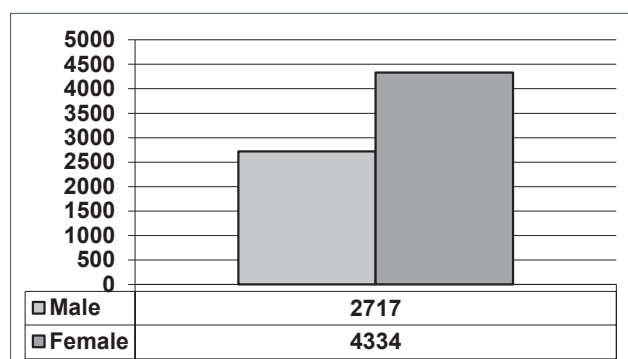


Figure 1. Representation of patients/wounded by gender

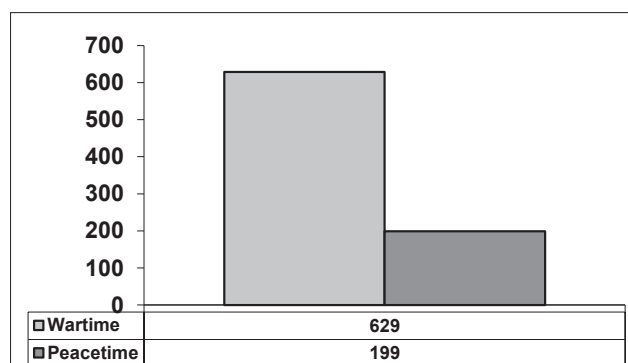


Figure 2. Types of injuries

At the surgical department of the War Hospital in Konjic in the aforementioned period of time was hospitalized 1310 patients/injured (18.3%), and at the other departments 5833 (81.7%).

Note: The surgical department treated patients of all surgical branches.

Of the total hospitalized in the surgical ward, 818 of them (62%) had an injury, and 402 (30.7%) had disease.

Of the total number of injured, 629 of them (78.9%) had a war injury, and 199 (23.1%) had an injury as consequence of accident.

Mortality due to the injury occurred in 36 cases (4.5%).

In most of the treated wounds were inflicted by explosives—75.5% and localized to the extremities—52.1%, 14.8% by rifle bullet, 15.6% was due to the fall and the impact of heavy objects, and in 8.7% of cases the cause was traffic accident.

Daily arrived 1-42 injured and almost all came in less than two hours from the time of injury.

Resuscitation measures in the field were applied in case of 414 injuries (66%).

RESUSCITATION MEASURES	Number	Percent (%)
Vein pathway	414	50.61
Airways	49	5.99
Immobilization	213	26.03
Catheterization	380	46.45
Esmarh	89	10.88

Table 1. Resuscitation on scene

Localization	Number	Percent (%)
Head and neck	99	12.1
Thorax	183	22.4
Abdomen	110	13.4
Extremity	426	52.1
Multiple	85	10.4
Mortality	36	4.5

Table 2. Localization of injury and mortality

Cause of injury	Number	Percent (%)
Mines and explosives	475	75.5
Ammunition/bullets	89	14.8
Fall + heavy objects	128	15.6
Traffic accident	71	8.7

Table 3. Causes of injury

Of the total number of injured, 292 (35%) were soldiers, and 526 (65%) were civilians, of whom 23 (3.2%) were children.

All the injured were treated according to the principles of war-surgical doctrine.

5. DISCUSSION

Of the total number of hospitalized at the surgical ward, 62% had an injury, a disease had 30.7%. Dominated by war injuries (78.9%). The total mortality in the surgical ward was 4.5%.

By localization were most often represented injuries of the extremities (52.1%), followed by chest (22.4%), stomach (13.4%), head and neck (12.1%), and multiple wounds (10.4%).

In case of extremity injury in 64% of cases it was a case of fracture of the bone and the skeleton, and 19.5% had an injury of the neuro-vascular structures.

Bone fractures were handled surgically in 52%, and conservatively in 48% of cases. The most commonly used surgical procedure was external fixation (42%), and as conservative methods most commonly used was plaster immobilization (47%).

In certain cases, when it was a peace-time trauma, we used quite successfully also methods of internal fixation (metal plate, Kuntcher) in 10% of cases, which is deviation from the war surgical doctrine.

What should be noted at this point is the fact that we included the group of child trauma. Of the total number of children who underwent surgery (89), trauma was present in 23 cases (26%), and disease in 66 cases (74%). War trauma was present in 87% of cases.

In cases of the blood vessels injuries, most commonly used method of treatment was ligature (71%), and the reconstruction was performed in 29% of cases.

Amputations are performed in 21% of cases and are usually performed flap amputation (84%).

Complications of limb injuries were registered in 20% of cases, the most common was a secondary amputation (3.3%).

In case of injuries to the head and neck of the operational methods, usually performed was osteoclasis craniotomy with

suture of the dura (13.1%). Chest injuries in 53% were solved surgically and conservatively in 47%. From the surgical methods most commonly used was thoracic drainage (92%), and thoracotomy was performed only in 8% of cases.

In case of injuries to the abdomen, usually it was a case of open injury (95%). All these injuries are surgically treated. The most common suture made of hollow organs (56%), resection of hollow organs (25%), hemostatic sutures liver (17%), splenectomy (15%), nephrotomy (11%), exteriorization at the site of injury (4%), etc. Complications were observed in 11% of cases.

In surgical abdominal diseases, we have been selecting surgical method according to pathology. Acute cases were 52% and 48% chronic. Acute pathology, usually was acute appendicitis (51%), and in chronic pathology usually was represented inguinal hernia (35%), followed by a stone in the gallbladder (15.1%). Complications of surgical disease were observed in 12.5% of cases.

Polytrauma was present in our material in 10.4%. Mortality in multiple traumas was 17.6%.

Consulting available to us and so far the published literature on the subject of war hospital, and organization of the complete system of care and treatment of injured and sick during the war, as part of an integrated health care system, we found a similar example.

Organization of Military Hospital from the Health Center close to the front lines, engaged in active combat operations, and care and treatment of patients/injured, in almost 90% of cases and definitely represents our original model, called by the name of it comes from: KONJIC MODEL.

Having in mind the presented results, which are achieved at the same time, it can be recommended model for use in areas under the siege, in cases of sudden and massive attacks.

Our achievements are compared with the results achieved by the War Hospital in Slavonian Pozega from the neighboring Republic of Croatia (Military Medicine, 160, 12-604., 1995).

Pozega municipality and the city by its area, population, the age and national structure is very similar to our municipality and the city. Health before the war was organized at the Medical Center which included Primary Health Care Center and the General Hospital with 353 beds. The Medical Center employed 123 doctors and 410 nurses. During the war, 25 doctors and 229 nurses left the hospital for various reasons.

Surgical ward with 110 beds, and 23 specialists (20 specialists and three trainees) and 64 nurses were the backbone of the development and functioning of War surgery, as the most important segment of healthcare in the war.

At the Surgical Department of the Medical Center in Slavonian Pozega during war period of two years (July 1991 till October 1993) treated is total of 959 injuries. Only 18 of them or 1.9% died. In most of the treated wounds inflicted explosive devices (51.2%) and localized mainly on the extremities (62.6%), 26.5% by rifle bullet, 0.7% were burns, while 19.6% was caused by the impact of heavy objects.

On average a day to pour 1-18 injured, and they all came in less than one hour of injury.

The largest number of soldiers were treated (855), the rest were civilians (100 of which four children).

All the injured were treated by surgical principles war doctrine. In case of injuries to the extremities in 101 cases of injuries (16.8%) were fractures, and in 51 patients or 8.5% peripheral

nerve injury. In 91 cases bone injury (88%) treatment was conservative, and only in 11 cases (12%) external fixator was used.

In cases of peripheral nerve injury in 22 cases of injury was neurotmesis. In most cases it was a violation of two nerves, and the highest percentage of injuries is: N. peroneus-15; N. ulnar-12; N. medianus-10.

When processing the wounds of war were applied principles of radical surgical treatment: debridement, which included excision of damaged tissue, with preserving neuro-vascular structures and covering devitalized bone fragments, and the extraction of foreign bodies. All wounds were left open, except those above the bones and joints. Irrigation of the wounds with hydrogen peroxide and physiological solution. Secondary wound closure was after three or more days.

Antibiotic therapy is used during first seven days and included: Crist. Penicillin 4 x 2 ml Gentamycin IV + 3 x 120 mg + Metronadizol 3 x 500 mg.

Amputation was performed in 12 cases of injury (2%), due to the heavy damage of soft tissue and bone structures.

Following reports of other institutions in the domain of war surgery, the experience of the authors of the recent wars talk about the percentage of amputations of 4-26%, associated neuro-vascular injury by 15-20%, the use of external fixation as a percentage of 30-40%, a very small percentage death 1-2% and in extremity injuries average of 30% of fractures.

Postoperative complications in case of the extremities injuries occur in the percentage of 20-23%, and postoperative reconstruction required 23-34% patients.

In case of injury to the head and neck, in a very small percentage (6.2%) craniotomy was performed.

In 32% of cases with head injury hurt came in a state of shock, usually hemorrhagic (29%). Mortality of the head injury he stood at 2.8%.

When talking about the injuries of the chest, frequent were non penetrating injuries (87.4%) compared to penetrating (12.4%). Treatment emphasis is on local wound treatment, prevention of shock, recovery of respiratory function, thoracic drainage and prevention of atelectasis. Thoracotomy is indicated in cases where the secretion of the drain is greater than 1500 ml and is made in the percentage of 20%. Mortality of the thoracic injuries was about 1.7%.

In the percentage of 8.8%, the authors report the abdominal injuries. The highest percentage of these was non penetrating violation (83%), while 17% were penetrating injuries. Most patients (82%) required hospital treatment. Most of penetrating abdominal injuries caused by bullets (86%). All penetrating injuries required a laparotomy. Injured organs most frequently were: colon (57%), small intestine (21%), liver (21%), spleen (14%), and stomach (7.1%). Mortality in abdominal injuries was 2.4%. All authors report a very small percentage of urogenital injury, only 0.6%.

6. CONCLUSION

During the war in Bosnia and Herzegovina, at the territory of Konjic municipality under the siege and without the possibility of dislocation of patients to the higher center of pre-war health service and single-handedly we formed a War Hospital.

Started with the functioning an original model of integrated health services, so-called. 'KONJIC MODEL'. Bearing in mind the very important fact that during the largest part of

the war aggression we were in the blockade, and we functioned completely independently, war-surgical doctrine could not be applied because we did not know anything about it.

Although the heart of such hospital was a war surgery, we're treated and hospitalized all patients, of all ages, not dividing the civilians from soldiers. With paramedics staff we have formed an entirely new service (transfusions, anesthesia). In the absence of adequate equipment, we used many improvisations, local resources, and with the help of our technical service engineers and factories in Konjic, who have the existing raw materials, manufactured external fixators, according to our drawings. We used equally, also certain technical aids, one that is normally used in the industry (pneumatic gun, various types of drills, etc.).

Education of staff, that we have hired and most of which had nothing to do with medicine, with work, proved to be very effective. Most of the temporary staff engaged, mainly technical and administrative fields, so loved that job, which after the war decided to stay. External exams at the newly opened medical school in Konjic made graduates of secondary medical workers, and individuals started medical faculty.

War Hospital managed by its organization, structure, personnel, in difficult material and technical conditions, without electricity, water and any help from the side, with a maximum operating discipline, respect for the presumed mayor, to treat all the injured and sick.

The total mortality in the surgical ward was 3.4%, and complications occurred in 17.5% of cases. Overall mortality treated at other departments of War Hospital was 2.3%.

War Hospital, in many cases of illness and injury, due to the proximity of combat operations, and all manner of constant blockade, uniting all four echelons of health care by war-surgical doctrine. Start the application of the doctrine of original beginning of the admission, triage departments and ending at the other hospital departments with definitive cure in 90% of cases. In the meantime, patients went through all the stages (diagnosis, resuscitation, surgical treatment, conservative treatment, isolation, etc.).

CONFLICT OF INTEREST: NONE DECLARED.

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