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Type, Severity, Location, and Timing of Battle Casualties in a Croatian Army Brigade during an Offensive Action in 1992

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Aim. To analyze the type, severity, location, and timing of casualties in a Croatian Army brigade during an offensive action against enemy forces of about two infantry battalions timely prepared for defense.

Methods. Casualties were analyzed according to bilateral manpower and equipment conditions, morale, time of the day, weather conditions, type of ground where the action took place, quality of planning and steering the course of the action, and especially the medical help. The action was carried out along one main and two auxiliary directions, including river crossing. The action involved about 1,000 soldiers and took 7 hours. It was divided into three phases: approaching the enemy, direct contact, and self-imposed retreat and evacuation. Medical care for the injured soldiers was organized in echelons, relying on civilian health care institutions.

Results. During the action, 92 casualties were recorded. The mean injury severity according to the Abbreviated Injury Scale (AIS) was 2.9 ± 1.4 . The highest proportion of casualties occurred on the main direction (48 or 52.2%) but the most severe injuries were inflicted on the second auxiliary direction (mean AIS, 2.6 ± 1.4). Extremely severe injuries (mean AIS, 2.0 ± 1.4) were recorded on the second auxiliary direction during the phase of retreat after a successfully performed action. However, regarding the whole action, the observed differences did not prove to be statistically significant.

Conclusions. Offensive action was properly planned and successfully led during the first two phases. Evacuation and retreat of the brigade were in part poorly organized. Health care for the soldiers functioned well throughout the action.

Key words: army personnel; combat disorders; Croatia; injury severity score; military medicine; soldiers; war

Planning of war actions includes a very sensitive and embarrassing issue of anticipating and assessing the losses. Numerous wars during the history of mankind have resulted in enough experience and the losses can be quite precisely anticipated. However, each action is characterized by some specificities that may entail minor or major deviations from the estimate (1-8).

An array of factors influence the rate and severity of casualties, most important of them being the level of training, psychological and physical fitness and level of equipment of both the own and enemy's units, territory where the action is to be performed, timing (day-night), and weather conditions. Readiness of the participating medical corps has a special role and significance for the unit, especially for their morale. On planning major actions, the readiness and capacity of civilian health care structures for possible collaboration and assistance are also of utmost importance (1,2). The aim of this study was to analyze the structure, location, and timing of casualties in a brigade during an offensive action against two infantry battalions backed by a tank and artillery platoon, timely prepared for defense.

Setting and Subjects

Main conditions on the two sides before the battle are presented in Table 1. Our intelligence service provided the data and estimates on the enemy forces. Our advantages included high motivation and morale, 100% manpower capacity (for our brigade that means 1,700 soldiers divided in three combat battalions plus a battalion for logistical support), poor morale in more than 50% of the enemy's soldiers, and timely and appropriate preparations for offensive action. The enemy's advantages were 100% material technical equipment capacity, high commanders' professional and authority level, timely organized defense, and, in part, our own failure in keeping data on the action planning strictly confidential, which resulted in only a partial surprise on the enemy's side.

Table 1: Basic characteristics of the conditions on both combat sides before the battle.
1: [view this table](#)

Time: spring, warm and bright. The attack started at six a.m.

Location: a plain wooded with broadleaf trees and low bush, sporadically swampy and hardly passable by war vehicles, which restricted their use. There was a river on the attack direction; it was crossed during the night before the battle, with subsequent guarding and protection of the crossing site, and boats and ferries ready for communications between the river banks.

The structure of casualties as well as the location and circumstances of their occurrence were analyzed on the main attack direction versus two auxiliary directions, with the total duration of action divided into three phases as follows: phase 1, approaching the enemy's positions; phase 2, direct contact with the enemy; and phase 3, retreat and evacuation in spite of conditions of military success, following the order from the Croatian Army Headquarters.

According to the plan of attack, the strongest brigade forces (one battalion supported by a tank platoon) were supposed to act on the main direction (Fig. 1). The most numerous and best equipped enemy's units were concentrated along the direction of the main forces attack.

Figure 1: Map of the offensive action by a Croatian Army brigade. The directions of attack are shown in spectra of grey color. [\[view this figure\]](#)

The medical corps support anticipated an echelon system of the management of the wounded, including the possibility of drowning and longer or shorter interruption of evacuation due to impossible river crossing. Thus, beside the usual preparations, the following additional activities were performed: 1) additional training of all brigade members in providing self-assistance and mutual assistance; training of platoon orderlies in providing first aid and of medical technicians in providing extended first aid; 2) in addition to the usual crucial bandage, each soldier was supplied with an extra more circular bandage and triangular bandage; 3) proper entrenchment and protection of the company reception points; 4) the number of stretchers greater than anticipated; 5) an adequate number of ambulances or adapted vehicles for transportation of the wounded; 6) special emphasis was put on proper hemostasis, analgesia and prevention of hemodynamic shock due to unpredictable duration of the possible stay at particular echelons (in case of possible problems with river crossing); 7) maximal reduction of the transportation time to civilian health care institutions, along with appropriate previous arrangements with the latter; 8) anticipating the need of providing first aid for the drowned; 9) anticipating a greater number of the wounded from explosives, mines, and firearms; 10) particular attention paid to the signaling system; 11) medical corps reinforcement in manpower and boats; 12) determination of the main and alternative sites of river crossing (Fig. 1); and 13) establishment of a brigade clearing station at the brigade command for the management of lightly wounded or diseased soldiers.

Kruskal-Wallis test for independent samples was used for the statistical analysis of data.

Results

During the offensive action, 92 (roughly 9.2% of 1,000 soldiers engaged in the battle) brigade members were wounded from different weapons (2), 48 (52.2%) of them on the main direction of attack. According to the Abbreviated Injury Scale (AIS) (9-11), severe injuries were inflicted on the second auxiliary direction of attack (Table 2). However, in the whole action, including all its phases, according to Kruskal-Wallis test for independent samples, there were no statistically significant differences between directions of attack. The time of transportation of the wounded ranged from 15 minutes to 2 hours (median=1.5 h). Fifteen patients were treated as outpatients in the batalion and brigade clearing station, whereas 9 were admitted to the clearing station (2). Other patients were transported to civilian medical institutions.

Table 2: Number and severity of injuries in brigade members (N=92) during the whole offensive action, inflicted on the main and two auxiliary directions of attack. [\[view this table\]](#)

Table 3: Number and severity of injuries in brigade members (N=92) during the offensive action, inflicted on the main and two auxiliary directions of attack in the first phase of attack. [\[view this table\]](#)

Attack Phase 1

The first phase of the action took about 2 hours, with relatively small losses (14 wounded or 15.2% of all the wounded), but the injuries, mostly inflicted by artillery, were severe (mean AIS=2.6±1.3) (Table

3). In this phase, the enemy had not yet figured our plans out, and their artillery fire was equally distributed all over the frontline, and our losses were therefore also quite comparable on all attack directions.

Attack Phase 2

This phase lasted for 3.5 hours or a half of the entire action duration, so that the losses were greatest (in total 56 soldiers), especially on the direction of main attack (Table 4). Although numerous, the injuries inflicted during this phase were least severe (overall mean AIS=3.1±1.5; mean AIS on the main direction=3.3±1.5). Concentration of the enemy's fire and a territory easy to survey contributed to such a high rate of casualties. In this phase, gunshot injuries were recorded (11 patients).

Table 4: Number and severity of injuries in brigade members (N=92) during the offensive action, inflicted on the main and two auxiliary directions of attack in the second phase of attack. [\[view this table\]](#)

Table 5: Number and severity of injuries in brigade members (N=92) during the offensive action, inflicted on the main and two auxiliary directions of attack in the third phase of attack (retreat and evacuation). [\[view this table\]](#)

Attack Phase 3 (Retreat)

Although the casualties in this phase accounted for only about a quarter (23.8%) of all losses, the injuries were very severe, especially on the second auxiliary direction of attack (Table 5). This phase lasted for about 1.5 h but the types and causes of wounding were more numerous than in the other two phases of action. Casualties were most commonly caused by fall, blow, and psychoneurological disorders (N=17), while explosive (N=5) and gunshot (N=3) wounds were extremely severe.

Discussion

When an offensive action is performed against an enemy well prepared for defense, with general conditions being equally favorable for both sides, the losses are as a rule much greater on the attacking side, since the defending side can use all means available, such as dugouts, shelters, mines, explosive and other obstacles, etc. (1,2). Timely collection of information, precise planning and proper leading of the attack, good coordination at all levels, and especially strict confidentiality ensuring the factor of surprise, are of utmost importance to achieve the goal of the attack, and to reduce the extent and severity of losses (1,2).

A number of factors had considerable impact on the circumstances and outcome of the attack described. From July 1, 1991, taken as the beginning of the war in Croatia, almost the entire Baranja region and the easternmost parts of Slavonia, including the towns of Ilok and Vukovar, were seized by the enemy who took advantage of their extreme superiority in war technology. The towns of Vinkovci and Osijek were defended by several-month superhuman efforts, and ceasefire was signed on January 3, 1992 (2,5,8).

The action aimed at partial territory recapture to diminish the possibilities of constant bombardment of the civilian targets from the nearby occupied territory. International forces (UNPROFOR) were unable to stop the enemy shelling civilians along the line of separation. As it was to be the first Croatian Army offensive action in the area, after months of frustrations, the soldiers' readiness was extremely high, in spite of all difficulties encountered. There were two serious reasons against the action, i.e., relatively poor equipment of the Croatian Army units, making an offensive action quite questionable, the more so when associated with river crossing; and political acceptability of performing such an action on a territory under the "protection" of international forces, especially in the case of failure (2).

Analysis of all these facts and results achieved in the action shows that the first two phases of the action were properly planned and performed. The brigade accomplished all tasks scheduled by the action plan within the anticipated period of 5.5-6 hours. River crossing, approaching the enemy, and direct contact with the enemy were carried out with a low rate of casualties of only 7% (70 wounded) (2). The broken enemy's lines and their high losses provided a guarantee for successful recapture of the settlements and final military success of the action. Organization of the brigade medical corps also was highly efficient (2). None of the wounded soldiers died nor their condition worsened in any of them during transportation to civilian medical institutions.

The last phase of the action, however, was less successful. Because the action was stopped for nonmilitary reasons in conditions of a military success, the retreat was partially disorganized, with considerable resistance among the soldiers. This resulted in injuries due to fall, blow, and psychoneurological disorders (fear, confusion, consternation, etc) along with very severe injuries on all three directions. That especially happened on the second auxiliary direction, inflicted by the enemy who tried to take advantage of our retreat and revenge for their previous losses.

Although it was the first offensive action of the Croatian Army on the East-Slavonia Front, accompanied by complex requirements concerning the management of the wounded/diseased soldiers, no major objection can be made on the medical corps support to the action. Medical treatment was not interrupted at any moment, whereas additional requirements emerging during disorganized retreat were solved by direct inclusion of the Medical Corps Chief of Staff. Wounding of a physician while working in the battalion aid station suggests that medical aid at the battalion level should have perhaps been organized at a greater distance from the enemy's line (5-7 km from the frontline).

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