Letters to the Editor

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War Injuries among Children in Karlovac District, Croatia

Injuries that result from operations of war and exposure to war weapons in the civilian environment are among the most obvious consequences of armed conflict for exposed civilian children populations. However, there has been very little research on this problem, epidemiological data on these injuries are scarce, and little is known about how such injuries can be prevented.

This study is based on a retrospective case series of children newborn to 17 years of age from Karlovac District in Croatia who were injured by war weapons between October 1991 and October 1993. War in this part of the former Yugoslavia started in autumn 1991 and remained intense until the beginning of 1992, when the cease-fire agreement took effect. Before the war, the population of Karlovac District was 173 185, but this number was changing constantly as the war was being fought and thus could not be accurately determined during the study period.

Cases were identified by retrospective review of records from all hospitals and emergency clinics in the district. The case list was compared with records maintained by the central government office for war victims. Additional information was collected by home visits to all families of injured children. Cases were classified into two groups: (1) all injuries sustained from operations of war (International Classification of Diseases, 9th Revision [ICD-9], E-codes 990–997), and (2) all other injuries caused by war weapons (e.g., children injured when playing with firearms) (ICD-9 E-codes 922–923, 998).

Fifty-seven children were treated for injuries caused by war weapons: 23 (40%) for injuries due to war operations and 34 (60%) for other injuries. Seven children died, three from injuries caused by war operations and four from other injuries. All 23 injuries sustained from war operations were caused by explosive projectiles; most of the other injuries were caused by detonators or other small explosive military hardware (14 cases) or by firearms (11 cases) (Table 1). Of these 34 other injuries, 29 were self-inflicted and 5 were inflicted by another person. Boys predominated as victims in both instances— injuries caused by war operations (16/23) and other injuries (32/34). Ten children treated for injuries caused by war operations were aged 0 to 9 years, and 13 were aged 10 to 17 years. Of the 34 other injuries, 8 occurred among children newborn to 9 years and 26 occurred among those aged 10 to 17 years.

Our findings highlight the public health importance of children injured by war weapons rather than by operations of war, a fact that is often obscured by casualties arising from war operations. In contrast to recent wide political and media attention to the problem of land mines, the great majority of children in our study population were injured by other types of war weapons. Teenage boys appear to be a high-risk group for these injuries. This profile of injury cases resembles the descriptive epidemiological features of unintentional firearm-related injuries among children in the United States, suggesting that possible preven-

| TABLE 1—Number of Children Injured by War Weapons, by Cause of Injury, Sex of Victim, and Type of Weapon: Karlovac District, Croatia, October 1991 to October 1993 |
|---|---|---|---|---|---|---|
| Operations of War | Other Injuries |
| Boys | Girls | Total | Boys | Girls | Total |
| Fragments of, or consequence of explosion of artillery shell, bomb, grenade, or other explosive missile | 16 | 7 | 23 | 1 | 0 | 1 |
| Fragments of hand grenade | 0 | 0 | 0 | 4 | 0 | 4 |
| Explosion of land mine | 0 | 0 | 0 | 4 | 0 | 4 |
| Explosion of detonator or other small explosive military hardware | 0 | 0 | 0 | 14 | 0 | 14 |
| Firearm missile (bullet) | 0 | 0 | 0 | 9 | 2 | 11 |
| Total | 16 | 7 | 23 | 32 | 2 | 34 |
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tive efforts might benefit from prior experience with efforts to prevent firearm-related injuries in the United States and Canada.5,6

To address this problem, a community-based injury prevention program has been initiated in Croatia and is currently being evaluated.

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References


Trauma-Related Care among the Uninsured in Massachusetts

A recent article by Haas and Goldman1 indicates that uninsured patients receive less trauma-related care than insured patients in Massachusetts, and concludes that excess mortality from trauma among the uninsured could be avoided if these patients received the same level of hospital resources as insured patients. At best, however, Haas and Goldman’s study indicates that rates of use for different types of care vary with insurance status; it offers no insight as to whether the uninsured fail to receive needed care.

Administrative data do not include sufficient detail to determine what type of care is needed by a particular patient;2 in the absence of this information, variation studies cannot distinguish between hypotheses of appropriate and inappropriate levels of care within a group.3 A variation study presumes that the underlying conditions in the groups are similar so that one can make conclusions based on observed differences in treatments or outcomes. In this study, however, the underlying conditions among the groups were very different. For example, among the third of the study population for whom information on the mechanism of injury was available, the uninsured were three times as likely as the insured to have a penetrating injury. Although the authors used Injury Severity Scores to control for these differences, these scores are inadequate for this purpose. They do not account for the specific body part injured,4 which is probably important in determining the need for surgery or intensive care, and previous work has indicated that the Injury Severity Score alone does not adequately predict the hospital resources necessary to treat patients.5 Consequently, there is no basis to conclude, for example, that because the uninsured have surgery less often, they are denied needed surgical care; and if needed care is not denied, then changing the amount of resources used would be unlikely to reduce excess mortality.

The authors offer several reasons for linking insurance coverage with the rate of use of hospital resources; each reason reduces to an effort on the part of hospitals to stem losses associated with treating patients who probably cannot pay for their care. The results presented in Haas and Goldman’s Table 3, however, are inconsistent with this explanation. Although the uninsured are less likely to receive surgery, they are no less likely to be treated in intensive care, which can be as costly as surgery. Under the authors’ reasoning, these results would imply that Massachusetts hospitals are denying surgical procedures to uninsured patients to save money but are failing to consider the ability to pay when placing patients in intensive care units. This inconsistency suggests that something other than insurance status is determining access to specific types of care.

Even if we ignore these issues, methodological concerns with the study suggest caution in accepting the results. First, the observed correlation of insurance status and resource use may actually be an artifact of the method used to select observations. To avoid double-counting patients, the authors excluded records that indicated a patient had been transferred from another institution, thereby eliminating patients who were transferred for treatment after being stabilized. To the extent that such transfers are more common among the uninsured, the observed correlation may be spurious. Second, it is questionable whether the models estimated by the authors accurately reflect the process that generates the outcomes at issue. One concern is that three of the outcomes under study (intensive care use, operative procedures, and mortality) are likely interrelated, yet the procedure used by the authors treats these outcomes as independent. Such procedures do not produce consistent estimates of the parameters of interest.6 Thus, it seems likely that what Haas and Goldman have estimated are not actually the odds ratios of interest, but rather the parameters of a reduced form equation that does not accurately represent the process generating the observations used in their study. We should therefore be reluctant to interpret their results as properly specified odds ratios relating insurance status to care received.

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