

Cranial gunshot wounds best managed in specialized trauma centers

To the Editor:

I am troubled by the conclusions reached by Drs Kanoff, Moncman, Henick, and King in their study, "Cranial gunshot wounds" (*JAOA* 1990;90:515-518). In a review of their experience treating 21 consecutive cranial gunshot wounds, the authors demonstrated a mortality similar to that reported in other published studies.

They implied that cranial gunshot wounds can be appropriately managed in a community hospital. This conclusion fails to consider functional outcome. Furthermore, it contradicts a national experience that demonstrates traumatic morbidity and mortality are reduced when patients are cared for in designated trauma centers.

The study includes a series of 21 consecutively admitted cranial gunshot wound patients and examines the admission Glasgow Coma Score (GCS) and locus of injury. The GCS does reasonably predict long-term outcome. However, the admission GCS does not reliably describe the extent or type of injury. It fails to consider confounding factors on the neurologic examination, such as drug or ethanol use.

Furthermore, the study makes no reference to associated factors of morbidity and mortality, such as shock, coagulopathy, or the caliber and the number of the wound-ing projectile(s). This information would have provided insight into the extent of tissue destruction and, I suspect, would have been a factor in determining survival.

My greatest concern centers on the absence of a description regarding the hospital course and functional outcome of the patients within the study group. Management objectives in caring for those patients with serious traumatic injury extends beyond achieving patient survival. By concentrating experienced personnel and specialized resources in regional centers, survival of such patients increases and complications are reduced. An improved functional outcome is conferred.

I reviewed the Trauma Registry at the Maryland Institute for Emergency Medical Services System (MIEMSS) for 1987 to 1989. As the primary trauma center for the state of Maryland, MIEMSS functions as the state's head and spinal cord injury center.

Ninety-one patients were admitted to MIEMSS with an isolated gunshot wound to the brain during this period. Of these, 79 patients (86.8%) were admitted directly from the scene, while 12 patients (13.2%) were transferred following initial stabilization at another hospital.

Of all the patients admitted, 74 (81.3%) were between 18 and 64 years of age; 78 patients (85.7%) were intubated tracheally prior to admission or within 30 minutes of arrival at the trauma center.

Overall, 67 patients (73.6%) died, with 10 patients in cardiac arrest on admission. This mortality rate is similar to that reported by others (43% to 66%) when patients admitted in car-

diac arrest are excluded. The trauma registry does not record data analyzing trajectory. Therefore, no inference could be made regarding single hemispheric, bihemispheric, or brain-stem-related outcomes.

Among nonsurviving patients, 53 (79%) died within 48 hours of admission. Average admission GCS was 4, with a range of 3 to 14. Of the nonsurviving patients, 61 (91%) had a GCS admission score of less than 8.

Patients in the survival group averaged 30 days' stay in the trauma center (range 1 to 60 days) and required mechanical ventilation for an average of 9 days (range 1 to 52 days). The average GCS was 11, with a range of 3 to 15.

Of the 24 patients who survived, 18 (75%) had an admission GCS greater than 8. Patients who survived their initial injury appeared to do well. At hospital discharge, GCS measurements among survivors averaged 14 (range 8 to 15). Nineteen surviving patients (79%) had GCS scores ≥ 13 at discharge from the hospital; 23 surviving patients (96%) were discharged to home or another acute-care hospital or rehabilitation center. Only one patient required transfer to a chronic-care facility.

These data strongly suggest that isolated gunshot wounds to the brain are devastating injuries with a high mortality irrespective of resuscitative capabilities provided the patient. Most deaths occur early in the hospi-

(continued on page 428)

COMING SOON FROM BRISTOL-MYERS SQUIBB

A new direction toward



better lipid management

tal course. More important than the mortality group, however, is the surviving group. Data here support the fact that patients who survive the initial insult progress to rehabilitation. Acute-care hospitalization among patients in the survival group is long and resource-intensive. Such a situation is likely to tax the resources of nontrauma centers.

Our experience at MIEMSS supports other study conclusions, namely, that outcome from a major traumatic injury is best managed in specially designated trauma centers.

KEVIN B. GEROLD, DO
Assistant Professor
Critical Care Medicine/
Anesthesiology
University of Maryland
Maryland Institute for
Emergency Medical
Services Systems
Baltimore, Md

Response

To the Editor:

We are grateful for Dr Gerold's comments and appreciate the opportunity to respond to them. First, the limitations of the Glasgow Coma Score (GCS) are well known and generally accepted. However, using the GCS is helpful in stratifying the patients relative to the severity of injury.

As Dr Gerold notes, the GCS does have use in the prediction of the patient's outcome. Our patients' outcomes correlated well with their initial GCS. The survivors' scores averaged 9.6, com-

pared with an average GCS of 4.1 among nonsurviving patients.

Dr Gerold criticizes the fact that the GCS imparts no information concerning the extent or type of injury; however, this information is provided in the text of our article. Furthermore, because our study was not intended to be a multifactorial analysis of cranial gunshot wounds, we elected not to include several factors that Dr Gerold noted were absent (shock, coagulopathy, caliber, or number of wounding projectiles).

He is captious of our "failure to consider functional outcome...." However, our article clearly states that 57% of the patients who survived their injuries were classified as good or mildly disabled according to the Glasgow Outcome Scale of Jennett and Bond.

On another point, Dr Gerold contends that our data "contradict a national experience that demonstrates traumatic morbidity and mortality are reduced when patients are cared for in designated trauma centers." Yet, our article compares mortality and morbidity data from major centers throughout the country with mortality and morbidity rates from our small patient population. Our results compare favorably, if not slightly better, in both categories with the other cited studies.

Similarly, Dr Gerold's data from the Maryland Institute for Emergency Medical Services System (MIEMSS) does not discredit our results. The mortality figure of 73.6% he cites, adjusted to 62.6% when the 10 patients who died of cardiac arrest on admis-

sion to the trauma center are considered, is higher than the mortality rate of 43% in our population.

His results merely reflect the discharge GCS measurements and the fact that the majority of surviving patients were discharged to home, another acute-care hospital, or a rehabilitation facility. Dr Gerold's data does not indicate a functional outcome level as does our data; therefore, a comparison is not possible. Nonetheless, even if we were to assume that all of the 24 patients (26.4%) who survived had a satisfactory recovery, this statistic is lower than the 12 patients (57%) in our study who made good functional recovery or had only mild disability.

We completely agree with Dr Gerold's comment that cranial gunshot wounds can be devastating injuries with high morbidity and mortality. At the time our study was conducted, no regional trauma center service system existed in the Philadelphia area; patients were routinely taken to the closest medical facility for treatment.

We believe our article is important because it demonstrates that patients with cranial gunshot wounds can indeed be treated in a community hospital setting and do as well, if not better, than the statistics from designated trauma centers would indicate. We make this statement with the understanding that a community hospital intending to provide such care must make the appropriate commitment to do so.

Our comments are not meant to take anything away from the

(continued on page 430)