

Letter to the Editor

# Tale of Two Cities: Collaborative Head Injury and Guidelines Study

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The generalizability of United States-based Brain Trauma Foundation (BTF) guidelines in regions and countries outside the United States, where resources and trauma systems may differ substantially has not been investigated.<sup>1</sup> In recently published article, the researchers examined the adherence to accepted BTF clinical guidelines for management of severe traumatic brain injury (TBI) in two different tertiary level institutions: Jai Prakash Narayan Apex Trauma Center in New Delhi, India, and Harborview Medical Center (HMC) in Seattle, Washington, United States.<sup>2</sup> The researchers also examined long-term outcomes in patients with severe TBI at each institution. Each center recruited 200 patients. The baseline patient characteristics were largely similar at two centers except for higher incidences of extracranial injuries at HMC. An overall guideline adherence rate was > 70% at both sites. Mortality rate in Delhi was 24% at hospital discharge, and in Seattle was 26.5%. Moreover, an adherence rate > 65% was associated with nearly twofold lower inpatient mortality in Delhi. In contrast, there was no relationship between guideline adherence and inpatient mortality in Seattle. This indicates that the inhospital outcome after intervention or management in acute stage does not differ in different trauma systems when the management protocol is guideline driven.

However, there were a few differences between two centers in terms of management. Only 63% of the patients in Delhi received intracranial pressure (ICP) monitoring, in contrast to Seattle, where 83.5% of patients received ICP monitoring. The therapy intensity level as determined by use of any treatment given for high ICP such as mannitol and propofol was significantly higher in Seattle, for example, 94.8% patients with raised ICP in Seattle received propofol as compare with only 24.0% in Delhi. Though higher adherence rate in Delhi was associated with lower mortality, 1% adherence was associated with a reduction of 3% inpatient mortality; the authors did not examine the

relative impact of adherence to various guideline indicators on inpatient mortality. This finding suggests that overall adherence to guidelines may be effective in reducing early mortality even without ICP monitoring or ICP monitoring-guided therapy.

The most important difference was long-term survival for patients with severe TBI between the two sites. Mortality rates in Delhi increased from 24% at hospital discharge to 35.5% at 12 months. In Seattle, mortality rates showed only a minimal increase from 26.5% at hospital discharge to 27.5% at 12 months. Mortality rates at HMC remained relatively unchanged at 12 months despite a patient population who was older and more severely injured and had a longer intensive care unit and hospital length of stay. The long-term survival after injury is often ignored in the studies on outcome of severe TBI from India.<sup>3</sup> In our study of validation of outcome measure, comprising 88 patients with severe TBI, we found that the inhospital mortality was 20.3% which increased to 30.4% at 6 months. We also found that the disability rating scale (DRS) at the time of discharge had good correlation with outcome at 6 months. The accuracy of DRS score for predicting mortality at 6 months was good. Hence, we recommend use of DRS at discharge as a surrogate marker of later outcome when it is not feasible to follow-up patients after discharge.<sup>4</sup>

The main reason of the difference in long-term outcome between two centers was discharge destination after acute care. Inpatient rehabilitation and postdischarge patterns between the two hospitals were drastically different, which may account for the disparity on long-term outcomes. In Delhi, none of the patients received inpatient rehabilitation care or was discharged to a skilled nursing facility, and only 4% had any type of rehabilitation after discharge. At HMC, only 16% of patients were sent home on discharge, 27% went to an inpatient rehabilitation facility, and 26% went to a skilled nursing facility. The difference in long-term survival between

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patients with TBI in Delhi compared with patients at HMC highlights the importance of care after hospital discharge on outcomes of patients with TBI. Limitations in postdischarge care for patients with severe TBI present difficult challenges for improving care in India. Adherence to intensive care guidelines is not enough to improve the long-term outcome of patients with severe TBI. The benefits of rehabilitation after acute care have been shown in study from India.<sup>5</sup> A holistic approach to the problem of TBI in India is essential and should be supported with targeted resources.

Less than 10 integrated multidisciplinary inpatient neurorehabilitation facilities are available in the country. Although long-term neurorehabilitation services are available, these are not enough to provide optimum care and to all those who need it.<sup>6</sup> Besides lack of neurorehabilitation centers, the main barrier to rehabilitation after TBI is lack of awareness that rehabilitation is beneficial. Little is known about the patients who are discharged from acute care. Follow-up rates are extremely insignificant. Unfortunately, almost all patients are left in hope of spontaneous recovery, and many suffer from disability because of a lack of awareness of further remediation alternatives.<sup>6</sup> Recently, India centric guidelines are proposed for management of TBI.<sup>7</sup> This document is an overview covering all aspects from awareness and prevention to pre-, in-hospital care, and neurorehabilitation. It recommends continuum of care for individuals with TBI. Any patient with TBI who has persistent and stable neurological deficit, who requires medical monitoring and has impairment in at least two key domains should be transferred to inpatient neurorehabilitation facility. Each Level I center managing TBI must have integrated multidisciplinary inpatient rehabilitation services. There should be provision for inpatient rehabilitation beds, manpower, equipment, and space to provide continuum of care in proportion to acute care. The Indian guidelines also provide indications for referral to various specialists in case of medical emergency. Such timely referrals can reduce mortality after discharge from acute care.

Though several guidelines are available for rehabilitation in TBI, BTF has not formulated guideline for rehabilitation.<sup>7</sup> As BTF guidelines for various aspect of management of TBI are popular worldwide, it is desirable that BTF comes out with guidelines for rehabilitation of TBI as well, which will lead to good functional outcome of patients with TBI after initial survival.<sup>8</sup>

#### Conflict of Interest

None.

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