



Priorities and Concerns for Research on Neurotrauma in the Developing World

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Neurotrauma, including cranial and spinal injuries, is a major health issue in both the developing and developed world. The incidence of traumatic brain injuries varies from 91 to 430 per 100,000 people, involving the younger active subpopulation of the societies [1]. Despite being a major cause of morbidity and mortality, neurotrauma is to a great extent preventable.

The incidence of neurotrauma is expectedly higher in the developing nations with lower income [1], and nevertheless, the epidemiology and etiology are significantly different as compared to those of the developed world. The rapid industrial and economic growth in developing countries has resulted in an enormous increase in the number of motorcycles and motor-vehicle accidents, which is probably the most common cause of neurotrauma in most developing countries [2]. The patient population, genetics, environment and habits may also be extremely different. Management strategies and access to necessary sophisticated resources are variable and in most settings deficient. Despite these significant discrepancies, most standards and guidelines in the literature have been proposed by the authors in high-income countries from well-resourced neurosurgical centers [3], which represent a different epidemiology and etiology as

compared to those of developing nations. Therefore, design and performance of epidemiological and clinical studies seems crucial for delineating these differences and establishment of more effective strategies for patient management in developing countries.

One valuable area of research on neurotrauma is prevention. The available data on the epidemiology of neurotrauma in developed societies may not necessarily help in establishing preventive strategies in developing nations. Important legislations mandating the use of helmets for motorcyclists, strict road-traffic regulations, and development of better road constructions are the results of epidemiological studies in this area. There is for sure need for more comprehensive studies.

A major baseline step in establishment of goal research projects in the field of neurotrauma is to institute comprehensive patient registries. Institutional or nationwide registries are valuable tools for data collection and further study design, which are currently lacking in many centers in developing countries.

One useful review [4] on the data collection strategies in developing nations concludes that neurotrauma is underrepresented in the international literature relative to the scale of the

problem. Data relating to in-hospital care and follow-ups are mostly deficient, probably because of heterogeneous data collection and categorization techniques. Another major problem is the variability of methods used to describe the epidemiological data. Many pre-hospital deaths are missed, and there is great discrepancy when reporting the data even in multicenter reports of the same affiliation. Special attention must be paid toward standardization of clinical and outcome measures to overcome such limitations. A successful example of such standardization has been international multicenter Crash trials [5], which have been performed using carefully standardized simple scales; while the main bulk of patients came from the developing nations.

Another useful area of research is to evaluate for cost-effectiveness of many expensive and invasive monitoring techniques used for severely head-injured patients. Although many of these techniques have become a standard in developed

countries, their widespread application is limited by absence of facilities and high costs for patients in low-income countries. Randomized controlled trials, the performance of which are not possible in full-resource settings of developed nations, may be ethically feasible in centers of the developing world. An interesting trial [5] evaluated the effectiveness of ICP monitoring as compared to clinical and radiological methods of ICP estimation in brain-injured patients of Latin America, and is a good example for further trials in this category.

In conclusion, it seems that an unfortunately high incidence of trauma in resource-limited settings of developing countries may be an otherwise ideal circumstance for performance of valuable studies and trials, the results of which may be more useful and relevant to the patients rather than published guidelines of high-income nations.

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