

Prevention of Neurotrauma: An Evolving Matter

Neurotrauma is a multifaceted disease. In recent decades, the number of injuries caused by violence and accidents has increased. Cranioencephalic trauma is a major cause of death in developed countries. It is estimated that alone in the United States of America, about 100,000 people die annually, and among the survivors, there are a significant number of people with disabilities with significant costs to the health system.^[1-3]

Cranioencephalic trauma is considered to be the injury of traumatic origin that occurs on the cranial vault and its contents. Traumatic brain injury is a major problem worldwide. It accounts for at least half of trauma-related

deaths and impacts on the high costs for health systems, support for treatment, and rehabilitation of patients. In the United States, the costs are estimated at 60 billion dollars annually, whether direct or indirect for loss of labor productivity. Modern trauma response teams, new diagnostic aids, neurosurgical centers, and intensive care treatment have contributed to lower mortality rates for patients with traumatic brain injury, where available series in the literature report mortality of 20%–30% of patients. Despite these effective advantages, there are many aspects that should be improved with regard to the management of traumatic brain injury.^[4,5]

In prevention of neurotrauma injuries, at this point, we need to define the categories of injury prevention, primary prevention is that which eliminates the event, secondary prevention decreases the effect, and tertiary prevention improves outcomes.

NEW EPIDEMIOLOGICAL FINDINGS

Injuries associated with trauma are a silent epidemic. The field of violence prevention is still under development but has grown significantly in the recent decades. International discussions on violence prevention policies have been analyzed in scenarios such as the United Nations Assembly and specifically in the World Health Assembly, where all the health ministers of the member nations of the World Health Organization participate.^[6-8]

Cranioencephalic trauma is a major cause of death not only in middle- and low-income countries but also in high-income countries. In addition, it generates an important number of people with disabilities, which implies an important cost burden for health systems at a global level.

Multiple regulations have been imposed through national protection programs, among which are the establishment of speed limits, mandatory use of seat belts, reflective waistcoats, and helmets. In addition, it has been proposed to impose sanctions on drunk drivers and police control on roads and areas at high risk of accidents. These areas usually present conditions that can increase the risk of traffic accidents, such as limitation of visibility, deterioration of their structure, defects of flatness, lack of signaling, and sharp curves.^[9]

The identification of areas of the greatest accident may contribute to the development of prevention programs led by governments and their road authorities. Knowledge about the magnitude and importance of prevention has increased markedly. It is important to promote knowledge of the categories in injury prevention, taking into account that primary prevention leads to the elimination of the causal event, secondary prevention decreases the effect, and tertiary prevention improves outcomes.

DEVELOPING NEUROTRAUMA PREVENTION PROGRAMS

There are already clear examples of measures to reduce the severity of urban road accidents, especially from an early age, such as the “Think First” program, supported by the American Association of Neurological Surgeons and the Congress of Neurological Surgeons. Other similar programs, largely using social networks, have been applied in different regions of the world as part of

national educational campaigns. Two examples of easy application include the “Mayo Amarillo” movement for the prevention of traffic accidents and the “Think Good” campaign, which was recently evaluated, by neurosurgery services in Brazil, including basic aspects such as presentation of readings and videos, distribution of educational pamphlets, design of graphic emblems of the campaign, distribution of T-shirts, and dissemination by mass media.^[10-12]

At present, we have evidence that interventions such as home visiting, parent education, abusive head trauma prevention, and multicomponent program are useful in the prevention of trauma, especially in child abuse injuries.

With the implementation of neurotrauma prevention strategies, it could impact on the reduction of approximately 1.2 million deaths from traffic accidents that occur annually in the world, representing about 3000 deaths/day. Most of these deaths occur in low- and middle-income countries. The challenge is important and includes many aspects such as measuring prevention legislation in neurotrauma, strengthening educational programs, improving infrastructure in cities to protect the vulnerable user in the public highway, and finally, the creation of databases that systematically compile information to redirect prevention strategies.^[13-16]

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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| | <p>DOI: 10.4103/jnrp.jnrp_194_17</p> |

How to cite this article: Hoz S, Moscote-Salazar LR. Prevention of neurotrauma: An evolving matter. J Neurosci Rural Pract 2017;8:S141-3.