Brachial plexus injury epidemiology

Epidemiological studies of traumatic brachial plexus injuries are few and most of them focus on treatment and prognosis.

A study of 2018 from Rasulić et al., in surgically treated civilian traumatic brachial plexus injuries in Serbia, there were seven different etiological factors. The road traffic accidents were the most common-41 (60.3%), while the motorcycle accidents were the most dominant subtype (53.7%) of all road traffic accidents, and also representing 32.4% of all causes of trauma. Supraclavicular elements of the brachial plexus were injured in more than 80% of patients. A total of 49 (72.1%) patients from the study had one or more associated injuries. The most common associated injuries were bone fractures, cerebral contusions, and vascular injuries [1)].

In 2014 a analysis of the epidemiological characteristics of patients with traumatic brachial plexus lesions in São Paulo, Brazil, the sixth largest city in the world.

This was a retrospective analysis of the epidemiological characteristics of patients submitted to surgical treatment of traumatic brachial plexus lesions in the Peripheral Nerve Surgery Unit of the Department of Neurosurgery of the University of São Paulo Medical School.

In the period from 2004 to 2012, 406 patients underwent surgery. There were 384 (94.6 %) men and 22 (5.4 %) women. In 45.9 % the compromised plexus was the right and in 54.1 %, the left. The average age was 28.38 years. Among the causes, the most frequent was motorcycle accidents (79 %). Most of the lesions were supraclavicular. In 46.1 % of cases the lesions were complete, in 30.1 % the lesions compromised C5/C6 roots, in 20.9 % the C5/C6/C7 roots were lesioned and in 2.9 % the lesion was in the lower roots, C8/T1. Among the associated lesions the most prevalent were head trauma, observed in 34.2 % of the cases; lesions of long bones in 38.8 %; clavicle fractures in 25.9 %; and thoracic trauma in 12.9 %.

In a population of adult patients with brachial plexus lesions with surgical indication, most of them comprise young male adults involved in high-energy motorcycle accidents [2)].

Jain in 2012 wanted to know the situation in an Indian centre. Data regarding age, sex, affected side, mode of injury, distribution of paralysis, associated injuries, pain at the time of presentation and the index procedure they underwent were collected from 304 patients. Additional data like the vehicle associated during the accident, speed of the vehicle during the accident, employment status and integration into the family were collected in 144 patients out of the 304 patients.

Road traffic accidents accounted for 94% of patients and of the road traffic accidents 90% involved two wheelers. Brachial plexus injury formed a part of multitrauma in 54% of this study group and 46% had isolated brachial plexus injury. Associated injuries like fractures, vascular injuries and head injuries are much less probably due to the lower velocity of the vehicles compared to the western world. The average time interval from the date of injury to exploration of the brachial plexus was 127 days and 124 (40.78%) patients presented to us within this duration. Fifty-seven per cent had joined back to work by an average of 8.6 months. It took an average of 6.8 months for the global brachial plexus-injured patients to write in their non-dominant hand [3)].

In 2010 the aim of a study of Dorsi et al., was to estimate the prevalence of brachial plexus injury (BPI) in pediatric multitrauma patients.

The National Pediatric Trauma Registry was queried using the ICD-9 code 953.4, injury to brachial plexus, to identify cases of BPI. The patient demographics, mechanism of trauma, and associated ICD-9 diagnoses were analyzed.

Brachial plexus injuries were identified in 113 (0.1%) of the 103,434 injured children entered in the registry between April 1, 1985, and March 31, 2002. Sixty-nine patients (61%) were male. Injuries were most often caused by motor vehicle accidents involving passengers (36 cases [32%]) or pedestrians (19 cases [17%]). Head injuries were diagnosed in 47% of children and included concussion in 27%, intracranial bleeds in 21%, and skull fractures in 14%. Upper-extremity vascular injury occurred in 16%. The most common musculoskeletal injuries were fractures of the humerus (16%), ribs (16%), clavicle (13%), and scapula (11%). Spinal fractures occurred in 12% of patients, and spinal cord injury occurred in 4%. The Injury Severity Score ranged from 1 to 75, with a mean score of 10, and 6 patients (5%) died as a result of injuries sustained during a traumatic event.

Brachial plexus injuries occur in 0.1% of pediatric multitrauma patients. Motor vehicle accidents and pedestrians struck by a motor vehicle are the most common reasons for BPIs in this population. Common associated injuries include head injuries, upper-extremity vascular injuries, and fractures of the spine, humerus, ribs, scapula, and clavicle [4)].

In 2006 a study of Flores from the Unidade de Neurocirurgia, Hospital de Base do Distrito Federal, Brasília, Brazil most of the lesions were supraclavicular (62%). Twenty-one cases occurred due to traction (60%), 9 to gun shot wound (25%), 3 to compression (8.5%) and two perforation/laceration (5.7%). Motorcycle accidents were the cause of trauma in 54% of patients. CT myelography demonstrated root avulsion in 16 cases (76%). Partial spontaneous neurological recovery was observed in 43% of the patients. Neuropathic pain occurred in 25 (71%) cases, and the use of some oral intake drugs (as amitriptyline or carbamazepine) controlled it in 64% of times.

Traction is the most frequent mechanism related to brachial plexus injuries, and root avulsions are common in this cases. Pain and concomitant lesions are frequently observed in these group. In this series, the rate of incidence to the local population was 1.75/100000/year. [5)].

In 1997 Midha published that Brachial plexus injury afflict slightly more than 1% of multitrauma victims. Motorcycle and snowmobile accidents carry especially high risks, with the incidence of injury approaching 5%. Head injuries, thoracic injuries, and fractures and dislocations affecting the shoulder girdle and cervical spine are particularly common associated injuries. Supraclavicular injuries are more common, are of more severe grade, more often require surgery, and are associated with worse prognosis, compared with infraclavicular injuries [6)].

References

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