

ORIGINAL RESEARCH

Non-traumatic spinal cord injuries: A descriptive study at the National Hospital of Sri Lanka

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Abstract

Background: Non traumatic spinal cord injury (NTSCI) is becoming increasingly prevalent worldwide, particularly with the rise in ageing populations. Despite this global trend, there is a lack of comprehensive data on the epidemiology and aetiology of NTSCI in Sri Lanka. This study aims to provide an epidemiological overview of NTSCI cases in a Sri Lankan cohort, focusing on demographic characteristics, clinical presentations, aetiologies, and outcomes.

Methods: This descriptive study included all patients diagnosed with NTSCI who were admitted to the neurology wards or attended neurology clinics at the National Hospital of Sri Lanka (NHSL). Patients were selected based on predefined inclusion and exclusion criteria. Data were collected using structured clinical records and analyzed using SPSS software. Variables assessed included demographic details, clinical features, investigation findings, and aetiological diagnoses.

Results: The study population had a mean age of 48.17 years (range: 17-78 years). Paraparesis was the most common presentation, reported in 81.5% of patients, while 18.5% presented with tetraplegia. A sensory level was documented in 42.6% of cases. Bladder and bowel involvement were observed in 48.1% of patients. Regarding aetiology, myelitis and demyelinating conditions accounted for the largest proportion (42.6%), followed by degenerative disc disease and disc prolapse (35.2%). Rare causes included syringomyelia and hereditary disorders (1.9%). A significant majority (93.6%) of patients underwent and responded positively to rehabilitation programs.

Conclusion: NTSCI in Sri Lanka primarily affects individuals in their late 40s, with both males and females represented. The most frequent aetiologies are demyelination, myelitis, and degenerative spinal conditions. Sensory, motor, and autonomic dysfunctions are common. Rehabilitation outcomes are generally favourable. These findings highlight the need for improved surveillance, early diagnosis, and targeted rehabilitation services to optimise care for NTSCI patients in Sri Lanka.

KEYWORDS

Non traumatic spinal cord injury, aetiology, myelitis, demyelination, degenerative disc disease



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INTRODUCTION

Spinal cord injury (SCI) can result in motor, sensory or autonomic dysfunction, often leading to significant disability and reduced quality of life. The damage to the spinal cord arising from non-traumatic causes is referred to as non-traumatic spinal cord injury (NTSCI).¹

An Australian study reports the average age-adjusted incidence rate of NTSCI in adults as 26.3 cases per million per year.² The global incidence of spinal cord injuries (primarily traumatic) is estimated at 15 to 40 cases per million.³ There is significantly less published data on NTSCI compared to TSCI. A study from the Republic of Ireland done in 2017 reported an incidence of 26.9 per million per year.⁴ There is a trend of increasing incidence and prevalence of NTSCI with advanced age.² An Australian study projected the prevalence of NTSCI in adults over 16 years to increase from 367.2 to 455 per million by the year 2027.⁵ NTSCI is more common in males and is extremely rare in children.² Traumatic spinal cord injury (TSCI) is more prevalent among young adults, posing a substantial burden on affected individuals, families and society.³

NTSCI can have different aetiologies.¹ In the West, the common causes of NTSCI include degenerative disc disease, spinal canal stenosis, tumours, vascular disorders and inflammatory conditions.^{6,7} There is lack of data on the aetiology and epidemiology of NTSCI in Sri Lanka.

According to global data, there is a rising trend of NTSCI with ageing of the population.¹ Therefore, assessing the incidence, prevalence, aetiology and survival following NTSCI is crucial due to this rising trend and the social burden. This is essential in order to plan health care services for the current demand and aim for the future burden. The aim of this study is to assess the situation in a selected group of NTSCI patients in Sri Lanka.

METHODS

The study was designed as a prospective descriptive study and was conducted at the National Hospital of Sri Lanka (NHSL) from 01.04.2021 to 31.12.2021 over a nine-month period. All patients with NTSCI admitted to the neurology

wards or attending neurology clinics at NHSL were considered for inclusion, based on pre-defined eligibility criteria. All patients presenting with clinically evident paraparesis and tetraparesis with or without sensory symptoms with a compatible spinal cord lesion on spinal magnetic resonance imaging (MRI) were included. Exclusion criteria included patients with traumatic spinal cord injuries, those under 16 years of age or individuals with neurological symptoms due to perinatal complications or cerebral palsy. Data collection was continued until the minimum sample size was reached. Consented participants were interviewed with an interviewer administered questionnaire. A complete examination of the nervous system was carried out by one of the investigators and the patient's records and imaging studies were reviewed and evaluated.

RESULTS

A total of 54 patients were included in the study. The mean age of the study population was 48.17 years (standard deviation (SD) 16.16) with ages ranging from 17 to 78 years. Of the participants 28 were males (51.9%) and 26 were females (48.1%). The majority 59.3% (32/54) were from the Western Province and 77.8% (42/54) were married. Only 31.5% (17/54) were employed at the time of data collection.

Paraparesis was the most common presentation, occurring in 81.5% (44/54) of patients, with 18.5% (10/54) having tetraplegia. Most patients had an incomplete SCI according to the American Spinal Cord Association (ASIA) Impairment scale (Table 1). Among the patients, 3 had a tetraplegic-complete SCI, 7 had tetraplegic-incomplete, 17 were paraplegic complete, and 27 were paraplegic-incomplete. Within the study population, 42.6% (23/54) had a defined sensory level, 48.1% (26/54) had bladder involvement and 48.1% (26/54) had bowel involvement.

Imaging studies revealed that 61.1% (33/54) of patients demonstrated spinal cord hyperintensity on MRI and 35.2% (19/54) had degenerative changes including disc prolapse and root compression. Dorsal and lumbosacral spinal segments were involved in 50% (27/54) of the cases.

The aetiology of NTSCI of the study population is presented in Table 2.

TABLE 1 Presentation according to the ASIA Impairment scale

Presentation	A	B	C	D	E
Paraparesis	17	18	7	2	0
Tetraparesis	3	5	2	0	0

TABLE 2 Aetiology of NTSCI

Aetiology	Number	Percentage
Disc prolapse Degenerative spine	19	35.2
Myelitis, Demyelination	23	42.6
Tumour, Metastasis	2	3.7
Tuberculosis/ Melioidosis	3	5.6
Metabolic, nutrient deficiency	5	9.3
Syrinx	1	1.9
Hereditary	1	1.9

Based on aetiology and age, the age range for degenerative spinal disease and disc prolapse leading to NTSCI was between 46 and 78 years, encompassing 37% patients in our study (20/54). For demyelinating diseases, the age range was broader, spanning from 17 to 60 years, and involved 23 (42%) of patients. Patients presenting with syringomyelia and hereditary causes were aged 28 and 38 years, respectively. Metabolic and infective aetiologies were observed in patients aged between 20 and 68 years. Tumour related spinal cord presentations occurred at ages 42 and 57.

Rehabilitation outcomes were favourable, with 93.6% (52/54) of patients showing satisfactory follow-up results. Rehabilitation protocols were initiated with inpatient physiotherapy. Patients with significant neurological compromise were transitioned to institutional rehabilitation programs, whereas those with less severe impairment continued with outpatient-based rehabilitation.

DISCUSSION

To our knowledge, this is the first study to investigate the epidemiology of non-traumatic spinal cord injury (NTSCI) among adults in Sri Lanka. In our study, NTSCI was more common in males (51.9%) than females (48.1%), consistent with trends in the world literature. In our population, the mean age of NTSCI was 48.17 years which is the common age group described in developed countries as well.

In terms of aetiology, demyelinating diseases and myelitis were the most prevalent causes of NTSCI in our study, though degenerative spine disease and spinal tumours were more frequently reported in the international studies.⁶

Spinal tumours were relatively less in our population. Syringomyelia and hereditary disorders were rare, reflecting their overall low prevalence.

The study demonstrates a notable pattern in aetiology relative to age distribution. Degenerative spinal pathologies were predominantly observed in the older population, whereas demyelinating diseases were distributed across a wider age spectrum, with a significant representation among middle-aged and younger individuals.

We found that incomplete paraplegia was the most common injury reported in our study which is similar to the study done in Ireland.⁵ It was reported that paraplegia was more common than tetraplegia in the Australian and Canadian studies where complete or incomplete status was not reported.⁶ Rehabilitation outcomes were favourable, with 93.6% of patients showing satisfactory follow-up results.

CONCLUSION

The mean age of patients with non-traumatic spinal cord injury (NTSCI) in Sri Lanka was 48. The most common aetiologies were demyelinating diseases, myelitis and degenerative spinal conditions. A high rate of rehabilitation follow-up was observed, which may help mitigate the long-term disability burden associated with NTSCI in the community.

Conflicts of interest

There are no conflicts of interest associated with the publication and the authors received no financial support for the research, authorship and/or publication of this article.

Author contributions

N.W. conceived the study. A.F. developed the methodology. N.W., P.M., S.B., and A.F. were involved in case examination and data collection. N.W. performed the statistical analysis and drafted the final manuscript. A.F. and S.B. provided supervision. All authors reviewed and approved the final version of the manuscript and its revision.

N.W. conceived the study. A.F. developed the methodology. N.W., P.M., S.B., and A.F. were involved in case examination and data collection. N.W. performed the statistical analysis and drafted the final manuscript. A.F. and S.B. provided supervision. All authors reviewed and approved the final version of the manuscript and its revision.

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Ethical clearance

This study received ethical clearance from the Ethics Review Committee of the National Hospital of Sri Lanka (NHSL), in accordance with institutional guidelines and ethical standards.

Data accessibility statement

Due to patient confidentiality, data are not publicly available, but may be obtained from the corresponding author upon reasonable request.

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