



DOES PRE-INJURY SOCIOECONOMIC STATUS AFFECTS THE OUTCOME IN SPINAL CORD INJURED PATIENTS?

Orthopaedics

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ABSTRACT

Pre-injury socioeconomic status of spinal cord injury patients has a significant role in their outcome. 50 Patients with traumatic spinal cord injuries were analyzed and the influence of socioeconomic status of the patient on neurological, functional and socioeconomic recovery is analyzed. Most of the patients were young males. The Socioeconomic status of the patient at the time of admission played a significant role in recovery of similar groups of spinal cord injured patients. Patients who belonged to Kuppasamy Socio economic class III had better recovery measured by FIM, Kuppasamy scale and AIS, than the patients who belonged to socioeconomic class IV and V. The society should actively take part in the social participation, reintegration and finding a suitable employment of the patients of low socioeconomic status.

KEYWORDS

Pre-injury socioeconomic status, Traumatic spinal cord injuries.

INTRODUCTION:

Spinal cord injury (SCI) is one of the most devastating conditions, which can result in severe disability to the patient and an excessive socioeconomic burden to the family and society. There is considerable variation in recovery within the population of spinal cord injured individuals across socioeconomic groups. Living with SCI exposes an individual to increased risk of poor physical, mental and social health that may be associated with increased morbidity and premature mortality. The study focuses on two important factors namely socioeconomic status and the availability of assistive devices that lead to disparities in outcome. These disparities in outcome impart an additional burden to the society on the rehabilitation and reintegration into the community. This study aims to analyze the disparity of outcome in patients with spinal cord injury among socioeconomic groups and stress on the responsibility of the society towards spinal cord injured patients of low socioeconomic class. This would help to individualize the rehabilitation program accordingly in various socioeconomic groups and would help in achieving the best possible neurological, functional and socioeconomic outcome in spinal cord injured patients.

MATERIALS AND METHODS:

This is a prospective and retrospective study of 50 patients of Spinal cord injury admitted at Madras Medical College, Rajiv Gandhi Government General Hospital after obtaining ethical committee clearance. Adult Patients who had traumatic spinal cord injury with neurological deficit, who underwent surgical stabilization of spinal column and discharged from the hospital, are taken up for study after obtaining consent. Details of demography and mode of injury were collected. The following **predictor variables** were taken up for the study.

1. Kuppasamy socioeconomic scale on admission.
2. AIS on admission

These variables are also used for analyzing the outcome at follow up. The patients are followed up for a minimum period of 2 years and their Functional independence measure motor scores (FIM) is assessed.

In this study, each SCI patient's socioeconomic status was assessed using his income, occupation and education as representative and were grouped into five categories according to Kuppasamy Socioeconomic scaling (I) Upper (26–29) (II) Upper Middle (16–25)

(III) Lower Middle (11–15) (IV) Upper Lower (5–10) and (V) Lower (<5). Clinical outcomes are graded according to AIS into 5 grades. The AIS is a standardized examination consisting of a myotome-based motor examination, dermatomal based sensory examination, and an anorectal examination. Based on the findings of these examinations, an injury grade is assigned. FIM motor score consists of 13 items that assess functioning across four different domains that include self-care,

sphincter control, transfers, and locomotion. The performance level for each item is strictly defined and ranges in value from 1–7, where 1 indicates complete dependence in an activity, and a score of 6 or greater indicates that a patient is capable of performing that activity independently, without supervision or help. The result is a discrete outcome variable with a minimum value of 13 and a maximum value of 91, with a larger value implying superior Outcome.

Stability of spinal column and the need for surgical stabilization is evaluated using plain radiographs and CT images. Injury to spinal cord is evaluated with T2-MRI and the qualitative findings are noted in all patients. Associated bony injury if any is documented.

RESULTS:

The data collected from fifty patients with spinal cord injuries was tabulated, analyzed and interpreted by using descriptive and inferential statistics based on the formulated objectives of the study. Descriptive statistics was done for all data and were reported in terms of mean values and percentages. Suitable statistical tests of comparison were done. Continuous variables were analyzed with the unpaired t test. Categorical variables were analyzed with the Chi-Square Test and Fisher Exact Test. Statistical significance was taken as $P < 0.05$. The data was analyzed using SPSS version 16 and Microsoft Excel 2007. While analyzing age distribution among study population, it was observed that majority belonged to 31–40 years class interval ($n=14$, 28.00%) followed by 41–50 years class interval ($n=12$, 24.00%) with a mean age of **37.92 years**, majority of the patients were **males** ($n=40$, 80.00%) followed by females ($n=10$, 20.00%). **Cervical spine** is most involved ($n=30$, 60.00%) followed by lumbar spine involvement ($n=12$, 24.00%) (FIG-1). While analyzing mode of injury, it was observed that majority of the study population had fall from height ($n=23$, 46.00%) followed by road traffic accidents ($n=22$, 44.00%).

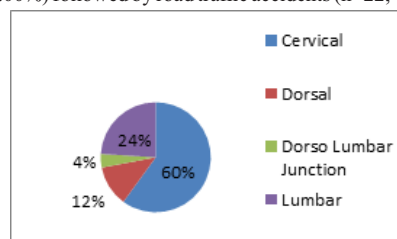


Fig-1: Showing The Distribution Of Region Of Spinal Column Involvement In Patients With Spinal Cord Injury

While analyzing socio-economic status, it was observed that majority of the study population belonged to middle socioeconomic class (upper, lower) $n=29$, 58.00% at initial examination, followed by lower socio-economic class (upper, lower) $n=11$, 22.00%. Majority of the study population at follow up belonged to **lower socioeconomic class**

(n=29, 58.00%) followed by middle socio-economic class (n=13, 26.00%). On comparison of socio-economic class at initial examination to follow up, the difference in the incidence of middle socio-economic class was 46.00 percentage lower. The difference in the incidence of lower socio-economic class was 66 % higher. Patients of low socioeconomic groups also had poor FIM Scores at 2 year follow up, while patients of middle socioeconomic group attained better scores in spite of similar neurological recovery in both groups. Age and sex were significant confounding factors in recovery.

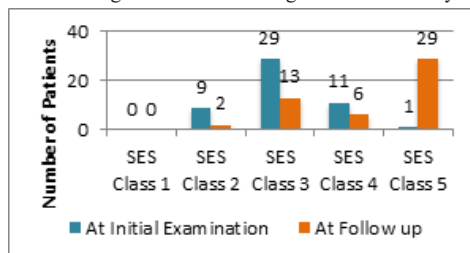


Fig-II: Showing The Change In Socioeconomic Status Of Spinal Cord Injured Patients

DISCUSSION:

This study provides descriptive data on a representative sample of survivors approximately 2 years after discharge from a tertiary hospital. Spinal cord injury (SCI) creates a state of dependency. Most of the patients in this study are productive males in the middle age group, and were the sole bread winners of their family. This sudden and debilitating injury most often results in chronic disability downgrading to a lower socio-economic class, poor participation in the community, unemployment and an increased risk for secondary health complications, that reframes an individual's entire life. Social and functional recovery of spinal cord injury patients in low socio-economic class is poor because of

1. Limited knowledge about the rehabilitation program
2. Low education levels leading to difficulty in using assisting devices and in the occupational rehabilitation.
3. Lack of sound environment which helps in good integration into the society and alternative jobs to earn sufficient income.
4. Higher secondary complication rates in low socioeconomic class

Socioeconomic status (SES) – typically assessed by differences in income, education, and occupations is consistently associated with differences in rehabilitation outcomes. Low income and education have been shown to increase the risk of mortality. Low socioeconomic class before injury also increases the risk for secondary health complications following SCI. Persons with high levels of education attainment are more likely to use customized wheelchairs and drive modified vehicles, which in turn improves their psychological and social outcomes following injury and also reduced rates of secondary complications due to disability. Access to rehabilitation aids and occupational therapy helps to maintain their socioeconomic class. Patients who use rehabilitation aids report employment success. The association between low socio economic class and health raises concern that persons with spinal cord injury are vulnerable to poorer health because of increased exposure to the financial hardship and material deprivation that frequently accompanies chronic physical disability, even after a good neurological recovery. Education, income, and occupational status pre-injury predict employment status after injury, such that persons with low levels of education and low income occupations are less likely to be employed post injury

CONCLUSION:

In this study, it was clear that initial socio-economic class of the patient influences the outcome positively. Physical disability due to spinal cord injury downgrades them to the next lower socioeconomic class.

LIMITATIONS:

This is a small study with a short follow up and needs further study with a larger group.

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