

Overview Causes of Patients with Spinal Cord Injury To The Inpatients At Melati Hospital, Sungai Penuh City In 2021

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Abstract

Background: Spinal Cord Injury is all injuries to the spinal cord which can cause motor and sensory disturbance and even cause permanent disability and death. This study aims to determine the description of the causes of patients with Spinal Cord Injury.

Method: This type of research is retrospective descriptive. Using cross sectional techniques in sampling, the number of samples is 21 medical records of patients with a diagnosis of Spinal Cord Injury, The instruments in this study used the Spinal Cord Injury checklist sheet, while the observed variables were: causal factors and Spinal Cord Injury.

Result: The results of the study are as follows: 71.43% of the respondents' gender is male, 61.9% of the respondent's age are old age, 33.33% of the respondents' education is elementary school, and 38.1% of the respondents' occupations are entrepreneurs. The cause of Spinal Cord Injury 71.43% is traumatic, with most cases falling from a height of 53.33% , non-traumatic causes as many as 28.67% with the most cases are infections. The most common Spinal Cord Injury classifications are Grade E 52.37% and Grade A 19.5%. Incomplete lesions as much as 66.67% with symptoms of impaired mobilization as much as 66.67%.

Conclusion: The most common cause of Spinal Cord Injury is can be concluded that the most common cause is TSCI / Traumatic Spinal Cord Injury with the highest prevalence is falling from height

Keywords: Causative factor, Spinal Cord Injury

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Introduction

Spinal Cord Injury (SCI) is an injury on the spinal cord causing either complete or partial abnormalities in the main function of motoric, sensory, autonomic, and reflex. SCI is one of the leading causes of neurological disability due to trauma. SCI covers damage to the spinal cord due to direct or indirect trauma resulting in complete or partial impairment of the main functions of motoric, sensory, autonomic, and reflex, either complete or partial [1]

WHO (2013) reports that the global prevalence of SCI reaches 40-80 cases per one million population per year or 2500-5000 cases per year with various causes. The National Spinal Cord Injury Statistical Center of the University of Alabama data published in February 2013 showed that the incidence of spinal cord injury reached 40 cases per one million population or 12,000 cases per year in the United States. SCI is common in young adults, with nearly half of all cases occurring between the ages of 16-30 years. Since 2010, the neurological disabilities suffered covered incomplete tetraplegia (40.6%) incomplete paraplegia (18.7%), complete paraplegia (18%), and complete tetraplegia (11.6%).[1,2]

After handling the trauma, immediate treatment is important to prevent rehabilitation complications. The treatment by nurses in collaboration with patients and other health workers aims to achieve maximum and independent mobility functions through re-education exercises in different environments. Improvement of functional ability is carried out continuously for 6 months and if there is no change, the disability will be permanent. Thus, a longer and more intensive training program is needed in order to maximize functional abilities and help a person adapt. Further treatment is highly needed including nutrition and psychological guidance. [2]

In Indonesia, SCI data were not recorded well as it is difficult to find the prevalence of SCI in this country. Maria Tulaar (2017) reported that the incidence of SCI recorded in medical records in 2014 in Fatmawati Hospital in Jakarta reached 104 patients consisting of 37 patients with TSCI (Traumatic Spinal Cord Injury) and 67 patients with NTSCI (Non-Traumatic Spinal Cord Injury). [2]

Referring to the International Perspectives on Spinal Cord Injury data (WHO, 2014), the incidence of spinal cord injury in men was 77.8% higher than in women. The incidence of spinal cord injury increases significantly in old age. Spinal injuries can interfere with the patient's quality of life because this injury causes paralysis of the limbs in fulfilling daily needs. Then, the

National Spinal Cord Injury Statistical Center of the University of Alabama (2017) data showed that spinal cord injuries often cause incomplete tetraplegia (40.6%), incomplete paraplegia (18.7%), complete paraplegia (18%) and complete tetraplegia (11.6%). [3]

Method

This study used a retrospective descriptive method to explain accurately, record the phenomena, and observe the subject by looking at past circumstances. This study used a cross-sectional design where the data collection of independent and dependent variables was carried out once at the same time. Indeed, not all subjects had to be examined on the same day or time, so there was no follow-up (Sastroasmoro and Ishmael, 2016). The population in this study was the medical record data of 21 patients with spinal cord injuries at Melati Sungai Penuh Hospital in 2021. The determination of the sample used a total sampling technique.

Result and Discussion

The results of univariate analysis can be seen below:

1 Characteristics of Respondents

a. Age

Table 1. Characteristics of patients by age

Age (year)	Frequency	Percentage
0 – 5	-	-
12 – 17	-7	- 33.3
18 – 40	13	61.9
41 – 65	1	4.8
>65	21	100
Total		

Based on the results of the study, the majority of respondents were older people aged 41-65 years (13 patients or 61.9%). This is in line with Chamberlain et al (2015) that out of 932 SCI cases in Switzerland, 423 people (45.4%) aged 31-60 years. This is because people in that age group are busy working with decreasing joint flexibility so they get hit on the spine, which can easily lead to SCI. [3,4]

b. Sex

Table 2. Characteristics of patients by sex

Sex	Frequency	Percentage
Male Female	15	71.43
Total	6	28.57
	21	100

Based on the results study, in terms of sex, the respondents were dominated by male patients. The respondent consisted of 15 men (71.43%) and 6 women (28.57%). It is assumed that in Indonesia, men are the backbone of the family, so they leave the house more for working to support their families, and even they have more physical mobility than women so they are susceptible to experiencing SCI. The incidence of SCI is higher in men than women.

c. Education

Table 3. Characteristics of patients by education

Education	Frequency	Percentage
Not attending schoolElementary	5	23.81
school Junior high school Senior	7	33.33
high school Diploma (D3)	4	19.05
University (S1)	4	19.05
Total	1	4.76
	- 21	- 100

Based on the results of the study, in terms of education, 7 respondents (33.3%) have an elementary school education level. This is in accordance with Statistics Indonesia data that the highest level of education completed by the population aged 15 years and over in 2018 was elementary school level (25.63%) (Statistics Indonesia, 2018). In this case, the researcher argues that people with lower levels of education are more susceptible to spinal cord injury as they do not understand the risks of action, and are unable to analyze risk factors before taking an action. Besides, it is sometimes caused by the type of work, for example, construction workers who are at risk of being traumatized. Thus, people with lower education level experience SCI than those with secondary or higher education levels. [4]

d. Employment

Tabel 4 Characteristics of patients by employment

Employment	Frequency	Percentage
Unemployed	5	23.81
Labourer/Farmer	6	28.57
Entrepreneur Civil Servant	8	38.1
Total	2	9.52
	21	100

Based on the results of the study, 8 respondents (38.1%) work as entrepreneurs. This is not in line with the Statistics Indonesia data that the most jobs are laborers/employees/farmers (38.11%) and self-employed/entrepreneurs (18.58%) of the total working population (Statistics Indonesia, 2018). The researcher thinks that jobs that are routine in nature such as laborers or farmers usually have a fixed way of working, so that the risk of Spinal Cord Injury can be slightly avoided. Meanwhile, people who work or are self-employed do not have fixed limits in their work and do not have standards operational procedures so that they are susceptible to experiencing SCI. Therefore, more types of self-employed jobs claim SCI than other jobs.

e. Medical Diagnosis

Table 5. Characteristics of patients by medical diagnosis

Medical diagnosis	Frequency	Percentage
Cervical SCIThoracic	9	42.86
SCILumbar SCI	2	9.52
Total	10	47.62
	21	100

Based on the results of the study, 10 respondents (47.62%) had Lumbar SCI. This is in line with Widhiyanto (2019) that the number of vertebral fracture patients who visited the emergency room of dr. Soetomo hospital with lumbar SCI was 153 patients out of a total of 442 patients. This is because lumbar regions are more than the other vertebrae so the lumbar workload is heavier. Thus, the medical diagnosis of lumbar SCI is higher than thoracic or cervical SCI. [5]

2 Spinal Cord Injury

a. Causes of SCI

Table 6 Characteristics of patients by SCI

Causes of SCI	Frequency	Percentage
Traumatic Non-traumatic	15	71.43
	6	28.57
Total	21	100

Based on the results of the study, the cause of SCI was traumatic in 15 people (71.43%) whereas out of these 15 people, 8 people (53.33%) were caused by falling from a height, either from trees or from buildings. This is in line with WHO (2013) that 43% of TSCI in Southeast Asia is caused by falling from a height. It is assumed that this condition cannot be separated from the number of SCI respondents who are mostly men as work related to heights such as construction or plantation labor is mostly done by men. Thus, the cause of SCI due to traumatic conditions is mostly caused by falling from a height, not by traffic or sports accidents. [1,7]

b. Classification of SCI

Table 7. Characteristics of patients by Classification of SCI

Classification of SCI	Frequency	Percentage
Grade ASIA A Grade	4	19.05
ASIA B Grade Asia C	2	9.52
Grade Asia D Grade Asia	3	14.29
E	1	4.77
Total	11	52.37
	21	100

Based on the results of this study, the classification of SCI, a total of 11 respondents (52.37%) had Grade ASIA E. A study by Chamberlain (2015) revealed that respondents with Grade E were only 1.3%, while the most dominant was Grade D with a total of 39.7%. It is assumed that this condition is caused by some factors such as patients' awareness levels of complaints of pain in the spine. Thus, if there are complaints, they will be checked immediately as fast and appropriate treatment can affect the degree of pain. Therefore, the classification of SCI for Grade E is higher than the others. [6]

c. Signs of SCI

Table 8. Signs of SCI

Signs of SCI	Frequency	Percentage
Complete lesion	7	33.33
Incomplete lesion	14	66.67
Total	21	100

Based on the results of this study, 14 respondents (66.67%) had incomplete lesions with the most common sign was cauda equina syndrome experienced by 8 respondents (57.14%). This syndrome is a damage to the lumbar or sacral nerves to the end of the spinal cord which caused sensory impairment and flaccid paralysis of the lower extremities and control of micturition and defecation (Morgan, 2015). Thus, it is assumed that this occurs because the lumbar region is more often used to move and support half of the body so that it is more susceptible to injury. This is in line with this study that the lumbar SCI was the highest. [1]

d. Symptoms of SCI

Table 9. Symptoms of SCI

Symptoms of SCI	Frequency	Percentage
Sensation Disorder	6	28.57
Motor Disorder	4	19.05
Vegetative Disorder	2	9.52
ADL Disorder	11	52.38
Mobilization Disorder	14	66.67
Decreased Vital Sign	5	23.81
Decubitus	4	19.05

Based on the results of this study, the most common symptom of SCI is mobilization disorder experienced by 14 respondents (52.38%). The mobilization disorder covered right and left tilts, transfer from sleeping to sitting, transfer from bed to wheelchair, and transfer from wheelchair to bed (Morgan, 2015). This is not in line with Kruger et al (2013) that the most common symptom of SCI is the presence of pressure sores which reaches 25-66% of the total population. In this present study, the incidence of pressure sores was experienced by 4 respondents (19.05%) in the Grade ASIA A. There were fewer pressure sores in this study than in other studies. It is assumed that pressure sores are closely related to mobilization as evidenced by all respondents who experience pressure sores from the Grade ASIA A. Good mobilization causes no static body parts so that blood circulation and oxygenation are smoother. Thus, pressure sores can be prevented. In this study, mobilization disorder becomes the most common symptom of SCI as tetraplegia and paraplegia often occur which disturb physical mobility. [6,7]

Conclusion

Based on sex, men have higher tendencies to experience SCI. In terms of age, most respondents are older people aged 41-65 years old, while the most common cause of SCI is traumatic, namely falling from a height. Concerning education, the majority of the respondents have an elementary school level. The most type of occupation is self- employed. The dominant classification of SCI is grade E with the majority of diagnoses of lumbar SCI incomplete with signs of cauda equina syndrome. The most common symptoms are motoric disorders.

References

- [1] Morgan N. Chen, Steven W. Thorpe, Joon Y. Lee, Alexander R. Vaccaro 2015. *Management of Traumatic Bilateral Jumped Cervical Facet Joints in a Patient with Incomplete Myelopathy*. US :Iknowledge
- [2] National Spinal Cord Injury Statistical Center,2017. *Facts and Figures at a Glance*. Birmingham, AL: University of Alabama.
- [3] Ning, G.Z., Yu, T.Q., Feng, S.Q, Zhou, X.H., Ban, D.X., Liu Y. 2011. *Epidemiology of traumatic spinal cord injury in Tianjin*. China: Spinal Cord
- [4] Steven c. Crishblum MD. 2016. *Patterns of Sacral Sparing Components on Neurologic Recovery in Newly InjuredPersons With Traumatic Spinal Cord Injury*. US : American Congress ofRehabilitation Medicin.
- [5] Sudigdo Sastroasmoro, Sofyan Ismael. 2017. *Dasar-dasar Metodologi Penelitian Klinis.Edisi Kelima*. Jakarta: Sagung Seto
- [6] Timothy T. Robert, Garret R. Leonard, Daniel J. Capella. 2017. *Classifications In Brief: AmericanSpinal Injury Association (ASIA) Impairment Scale*. US. Clinical Orthopaedics and Related Research.
- [7] WHO. 2013. *International Perspectives on Spinal Cord Injury : ISCOS*