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INCIDENCE AND PREVALANCE OF DEEP VENOUS THROMBOSIS IN PATIENTS WITH SPINAL CORD INJURY

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ABSTRACT

INTRODUCTION: Deep Venous Thrombosis and its sequel pulmonary embolism are leading causes of morbidity and mortality in patients with spinal cord injury. It is one of the serious complications in spinal cord injury patients which is often unaddressed till its occurrence. This study was designed to determine incidence and prevalence of Deep Venous Thrombosis among patients with Spinal Cord Injury in tertiary care centre.

OBJECTIVE: First to prevent incidence of deep vein thrombosis among patients of spinal cord injury, secondarily early identification and management of deep vein thrombosis thereby prevent the morbidity and mortality.

MATERIALS AND METHODS: This is a prospective study in a tertiary care centre over a period of one year from October 2017 to September 2018. Patients with spinal cord injury were subjected to Colour Doppler ultrasound on 3rd day, 7th day and 1 month after injury. Diagnosis of Deep Venous Thrombosis is confirmed on the basis of clinical signs and positive result on color Doppler ultrasound.

RESULTS: A total of 106 patients were included in the study during the period. Prevalence is 6.6% with preponderance to male population (85.7%). Incidence is more among patients with cervical injuries (85.7%). All patients who developed Deep Venous Thrombosis were of ASIA grade A.

CONCLUSION: The prevalence of Deep Venous Thrombosis in present study is on par with other studies. Large trials and prospective studies are required to truly determine the prevalence of Deep Venous Thrombosis. Thromboprophylaxis, screening and early detection of Deep Venous Thrombosis should be a part of initial management of patients with spinal cord injury.

INTRODUCTION:

In patients with spinal cord injury Deep Venous Thrombosis and its sequel pulmonary embolism are life threatening secondary problems. [1,2] They are associated with high economic burden and one of the major causes of morbidity and mortality in patients with spinal cord injury. [3]In spinal cord injury survivors the 3rd major cause of death is Deep Venous Thrombosis and its complications.[4]The risk of venous thromboembolism results from the presence of all three elements of Virchow's triad: endothelial damage, stasis of blood flow and hypercoagulability.[5]In spinal cord injury patients the ratio for Deep Venous Thrombosis was 2.46 fold higher compared to general population.[6]The prevalence of Deep Venous Thrombosis varies from 5% to 26% among the patients of spinal cord injury.[7]In view of the fact that Deep Venous Thrombosis is uncommon among Asian population thromboprophylaxsis is not routinely performed in patients with spinal cord injury.[8][9]According to recent studies it is demonstrated that the risk of Deep Venous Thrombosis is similar in Asian's as that of western population.[10][11] Deep Venous Thrombosis incidence was 43% in KOREA, 21% in JAPAN and 3% in INDIA in spinal cord injury patients.[10][12]By knowing the prevalence of Deep Venous Thrombosis in spinal cord injury patients and complications associated with it thromboprophylaxsis measures can be introduced early.[13]

MATERIALSANDMETHODS

This is a prospective study conducted in Department of Neurosurgery, Andhra Medical College from October 2017 to September 2018 over a period of one year. All patients with isolated spinal cord injury were included in the study and patients with multiple injuries and other comorbidities were excluded. Colour Doppler Ultrasound was the investigation of choice for confirming Deep Venous Thrombosis. Spinal cord injury patients were subjected to colour Doppler on 3rd day, 7th day and one month after injury. Physical therapy measures, such as passive range of motion exercises were advised. Demographic information, cause of injury, neurological level, ASIA impairment scale, information regarding Deep Venous Thrombosis were recorded.

RESULTS

A total of 106 patients were included in the study. The mean age was 37.3±13.1 years. A major portion of the included patients were males 84.9% (n=90) while female population was 14.15% (n=16). Majority of the patients were laborers 33.9% (n=36) and uneducated 58.4% (n=62). Fall from height 65.09% (n=69) was the most common cause of spinal cord injury in these patients. The level of injury was cervical in 52.85 (n=56), dorsal in 27.3% (n=29), lumbar in 19.8% (n=21).

Based on Colour Doppler Ultrasound 7 (6.6%) of 106 patients were diagnosed to have Deep Venous Thrombosis. Of the 7 who developed Deep Venous Thrombosis 85.7% (n=6) were males and 14.2% (n=1) was female. 40-50 years was the common age group for development of Deep Venous Thrombosis 57% (n=4). 71% (n=5) of patients developed Deep Venous Thrombosis after 7th day. 29% (n=2) patients developed after one month of injury.

All the seven patients who developed Deep Venous Thrombosis were of ASIA Grade A.

Table 1: showing demographic details of the patient who developed deep venous thrombosis.

	Parameter	Number of patients
Gender	Male Female	6 (85.71) 1 (14.2%)
AGE(in years)	<20 20-30 30-40 40-50 >50	- 2 - 4 1
Cause of Injury	Fall from height Road traffic accident	5 (71.4%) 2 (28.5%)
Level of injury	Cervical Dorsal Lumbar	6 (85.7%) 1 (14.2%) -
ASIA Grade	A B C D E	7 (100%) - - - -

DISCUSSION

Spinal cord injury patients are at high risk of developing Deep Venous Thrombosis. In patients with spinal cord injury prevalence of Deep Venous Thrombosis ranges from 5% to 26%.[7] It is a common belief among clinicians that Deep Venous Thrombosis is more prevalent in Caucasian populations.[5] However many studies reported high prevalence of Deep Venous Thrombosis among patients of spinal cord injury even in East Asian population. The prevalence of Deep Venous Thrombosis in spinal cord injury patients of Asian population ranges from 3% to 43%. [4][7][10][12] The low prevalence of Deep Venous Thrombosis in Asian population is due to differences in factors like race, genetics, climate and diet. [5][14] The incidence of Deep Venous Thrombosis in the present study consistent to study conducted by RIKLIN et al. though there was use of thromboprophylaxsis in his study.[16] In another study conducted by AGARWAL et al. in 2009 in INDIA the incidence was only 3% in patients without any pharmacologic thromboprophylaxsis, which is much less compared to the present study.[12]

Deep Venous Thrombosis in majority of patients with spinal cord injury is seen within the first three months from 3rd day to the end of 3rd month, with its peak occurrence between the 7th and the 14th day past injury.[18] In our study the time of incidence ranged from 7 days to 30 days with peak incidence after 7 days which is consistent with literature. Following the acute phase, Deep Venous Thrombosis frequency decreases, though it is still reported, as the risk factors of immobilization and stasis of blood flow are present. In the present study all patients who developed Deep Venous Thrombosis were quadriplegic and had complete spinal cord injury.

Research studies reported that clinical symptoms and signs are unpredictable in diagnosing Deep Venous Thrombosis in spinal cord injury patients.[5] In the present study if the patient had both fever as well as an increased calf girth, then they had high significant correlation with the occurrence of Deep Venous Thrombosis.

Pressure sores were noted among three patients (42.85%) of the seven. Life time prevalence of pressure sores in spinal cord injury patients is about 80 %.[17] RATHORE et al. reported 66% of patients with pressure sores in his study.[9]

TABLE 2:

Author/ Year/Country/Reference No)	Study Begin	Prophylactic methods	Incidence %	Method of Diagnosis
Powell etl 1999, USA (16)	Retrospective	Pharmacologic thromboprophylaxsis with or without intermittent compression device	4.1%	Doppler US
		No pharmacologic thromboprophylaxsis with or without intermittent compression device	16.4%	
Riklin et al 2003, SWISS (17)	Retrospective	Pharmacologic thromboprophylaxsis	6.6%	Doppler US/ Venography
Agarwal et al 2009, INDIA (12)	Prospective	Pharmacologic thromboprophylaxsis	1.8%	Doppler US
		No Pharmacologic thromboprophylaxsis	3%	

CONCLUSION

The prevalence of Deep Venous Thrombosis in present study is high when compared to other studies. Large clinical trials and prospective studies are required to truly determine the incidence and prevalence of Deep Venous Thrombosis. Thromboprophylaxsis, screening and early detection of Deep Venous Thrombosis should be a part of initial management of patients with spinal cord injury.

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