


Original Research Article

# Prevalence of deep vein thrombosis in acute stroke in Government Dharmapuri Medical College Hospital

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## Abstract

**Introduction:** Venous thrombo embolism (VTE) is a frequent cause of preventable illness and death in hospitalized patients. 25% of all cases of venous thrombo embolism are associated with hospitalization and 50 to 75% of cases of VTE in hospitalized patients occur on those in medical wards.

**Aim of the Study:** Prevalence of Deep vein thrombosis in patients admitted with acute stroke. The need for routine anticoagulation for prophylaxis against DVT in acute stroke patients.

**Materials and methods:** Out of 145 patients enrolled for the study after applying the exclusion criteria 50 patients were selected for duplex ultrasonography of lower limb venous system.

**Results:** In our study the prevalence of DVT in acute stroke was analyzed by ultrasound venous Doppler of lower limbs. The analysis of co morbid conditions like diabetes, systemic hypertension, ischemic heart disease, smoking and alcoholism were analyzed to find out if there was any association between their presence and occurrence of DVT. In all these parameters compared within the group of DVT positive patients the p value was more than 0.05 which is statistically insignificant.

**Conclusion:** The prevalence of DVT in acute stroke patients in our hospital group was 6% which is significantly less than that observed in western population. Duplex USG is a useful tool which can be used as a screening tool for early diagnosis of DVT. DVT occurs more commonly in paralyzed limb than non paralyzed limb.

## Key words

Venous thrombo embolism, Duplex ultrasonography, Ischemic heart disease.

## **Introduction**

In general, detection of deep vein thrombosis (DVT) in hospitalized patients not on thromboprophylaxis by venography is 10.5% to 14.9% [1] and by ultrasound venous Doppler is 5%. Thrombosis was asymptomatic in 70% of cases [1]. Pulmonary embolism occurred in 0.3 to 1.5% of cases and proximal DVT in 2 to 4.9%. PE accounts for 5 to 10 % of deaths in hospitalized patients [2]. In One meta-analysis of four studies of 5256 patients with DVT as end point and 5 studies of 7355 patients with death as end point and 9 studies of 19,958 patients with pulmonary embolism as end point anticoagulation decreased relative risk of pulmonary embolism (0.43; 95% CI 0.26- 0.71) and fatal pulmonary embolism (0.38; 95% CI 0.21 - 0.69) and non-significant relative risk of DVT (0.47; 95% CI 0.77 – 1.00) with no effect on overall mortality and non-significant increase in relative risk of bleed (1.32; 95% CI 0.73 to 2.37). Three randomized control trials with Enoxaparin (MEDENOX)  $p < 0.001$ , the prospective evaluation of Dalteparin efficacy for prevention of VTE in immobilized patients trial (PREVENT)  $p = 0.002$ , Arista for thromboembolism prevention in medical indication study (ARTEMIS)  $p = 0.03$  using fondaparinux were done to assess the use of anticoagulation routinely in all immobilized patients [3]. The end point was the presence of asymptomatic distal thrombi diagnosed by means of screening venography. The presence of DVT was found in 60% of the stroke patients thus stressing the use of routine anticoagulation in patients with extremity paresis or paralysis [4]. Analysis of data from IST , international stroke trial allows a comparison of the effect of medium dose heparin (12,500 U of UFH twice daily) initiated within 48 hrs. of ischemic stroke and continued for two weeks to no heparin on a number of end points. Although this dosing regimen reduced the risk of PE and recurrent ischemic stroke, the reduction was more than offset by an increased risk of hemorrhagic transformation and extra cranial hemorrhage. Overall there was an increased risk of death and

or recurrent stroke and major non-fatal extra cranial bleeds of 0.5% and 1.5% respectively during the treatment period [5]. White, et al. studied the risk of warfarin related complications in 22,000 unselected group with subgroup of 1312 patients with h/o stroke, the readmission rate due to bleeding was 1.7%. The excess risk of intracranial hemorrhage in this subgroup was not specifically studied, though it was 0.1% in the group as a whole [6].

## **Materials and methods**

Cross sectional – hospital based prevalence study. The study was conducted for a period of 6 months from December 2016 to May 2017.

### **Inclusion criteria**

- Patients with acute stroke of less than two weeks duration.
- Recovery of power from admission till the end of study period less than 3/5.
- Patients with or without known history of diabetes mellitus, systemic hypertension.
- Patients with risk for accelerated atherogenesis such as smoking or alcoholism.

### **Exclusion criteria**

- Duration of stroke more than two weeks.
- Recovery of power from time of admission to screening for DVT is more than 3/5.
- Pregnancy.
- Patients on treatment with drugs like aspirin, OCPs or anticoagulants.
- Patients with underlying procoagulant states previously known.
- Patients with underlying connective tissue diseases.

### **Methodology**

All patients admitted with c/o acute stroke of less than two weeks in our hospital, were screened preliminarily with a proforma to assess the presence of predisposing conditions of CVA like diabetes, systemic hypertension, ischemic heart

disease and valvular heart diseases. Also patients were specifically questioned on their medications which could affect coagulation as well as any history of addictions. Detailed physical examination was done. Basic investigations like CBC, Random blood sugar, Serum fasting lipid profile and ECG were taken for all patients included in the study. CT brain was also done. Evaluation of cardio vascular system with echocardiography was done. The patients were examined and their improvement with regards to general physical condition, control of blood pressure and improvement in neurological status with special attention to recovery of tone and power was assessed daily. Signs and symptoms for development of DVT were specifically looked for. Patients with Diabetes, ischemic heart disease and other underlying diseases were treated for their respective diseases in addition to receiving anti edema measures, antibiotics and anti-ulcer drugs as well as aspirin in recommended dose for patients with ischemic stroke. Physiotherapy to the paralyzed limb was started as early as day1 of admission and patients and their care givers were encouraged to continue it all through their hospital stay. Patients with persistent hypotonic and power < 3/5 at the end of 14 days were screened for the presence of DVT of the paralyzed limb with ultrasound venous color flow Doppler on day of admission and day 14 and the results documented. Patients who had developed DVT despite intensive physiotherapy were treated with leg elevation, graded compressive stockings and LMWHs. They were followed up during the entire course of hospital stay with repeated USG venous Doppler.

### Statistical analysis

Statistical analysis was carried for 50 subjects. Age, presence of diabetes, systemic hypertension, ischemic heart disease, smoking, and alcoholism in DVT positive and negative group were analyzed. The statistical significance calculated using chi-square test. Statistical significance taken when p value < 0.05. Statistical analysis were carried out using standard formulae. Microsoft excels 2003 and SPSS

(statistical package for social sciences) version 13.0 soft wares were used for data entry and analysis.

### Results

In our study the prevalence of DVT in acute stroke was analyzed by ultrasound venous Doppler of lower limbs. The analysis of co morbid conditions like diabetes, systemic hypertension, ischemic heart disease, smoking and alcoholism were analyzed to find out if there was any association between their presence and occurrence of DVT. In all these parameters compared within the group of DVT positive patients the p value was more than 0.05 which is statistically insignificant (**Table – 1, 2, 3**).

**Table - 1:** Prevalence of DVT in acute stroke patients.

Total number of patients in whom venous doppler was done	DVT positive	%
50	3	6%

**Table – 2:** Patient characteristics.

Characteristics	Present	Absent		
	(No)	%	(No)	%
DM	9	18	41	82
SHT	15	30	35	70
IHD	2	4	48	96
SMOKING	22	44	28	56
ALCOHOLISM	14	28	36	72

**Table – 3:** CT findings.

CT	Number	%
Infarct	42	84
Hemorrhage	8	16
Total	50	100

### Discussion

The prevalence of DVT in patients with acute stroke admitted into government general hospital is found to be 6% as against a prevalence of 60% reported in western literature [7]. The exact

cause for this discrepancy is not known but there does seem to be difference in occurrence of DVT in different ethnic groups as revealed by studies. The incidence of post op DVT in Europe is twice that of North America, similarly autopsy series showed prevalence of thrombo embolism is 40.6% in Boston and 13.9% in Kyushu, Japan. This may probably be explained due to regional variation in underlying medical conditions or true variation in genetic and environmental factors [8]. There are also studies published reporting increases in incidence of DVT with age. In elderly probably there is an increase in number of thrombotic risk factors or there exist an acquired thrombotic state, with anatomic changes in soleal veins with more pronounced stasis in valve pockets [9]. The prevalence of DVT both asymptomatic and symptomatic in acute stroke patients in our hospital was only 6% and the exact occurrence of pulmonary embolism in these patients is not known. Though there are widely conducted trials in the west on routine prophylaxis of DVT with anticoagulants as early as day 2 of stroke, such studies are not available in Indian population and the data from west cannot be extrapolated to our population as the prevalence of DVT is found to be very low and majority are asymptomatic [10]. The mortality and morbidity rate of patients with acute stroke in our study population was not significantly affected by withholding routine anticoagulation therapy. Risk associated with anticoagulation in acute stroke should also be taken into consideration [11]. In the IST, treatment with low dose unfractionated heparin (5000 U s.c. twice daily) significantly reduced death and recurrent stroke at 14 days from 12 to 10.8%, a benefit attributable to decreased risk of recurrent ischemic stroke as PE was not significantly reduced [12]. There was also increased risk of hemorrhagic transformation and extra cranial bleeds. The balance of risks might therefore favor initiation of anticoagulation treatment in established venous thrombo embolism after stroke, where the risks of untreated VTE is high and mortality is proven to be reduced with anticoagulation therapy [13]. The routine prophylaxis for patients with asymptomatic

below knee DVT is still controversial and more studies are recommended before the benefits could be conclusively established [14].

## Conclusion

VTE is a preventable cause of morbidity and mortality in stroke patients and there is a need for more anticipatory approach in diagnosis. The presence of comorbid conditions like diabetes, SHT, IHD, smoking and alcoholism does not affect the occurrence of DVT in acute stroke thus it is an independent contributor to morbidity and mortality in stroke patients. The use of routine anticoagulation in all stroke patients in our population requires further large scale trials before their benefits could be conclusively proven [15].

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