



## Original Article

### INCIDENCE OF POSTOPERATIVE DEEP VEIN THROMBOSIS: A STUDY OF 150 CASES

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#### Abstract

**Background:** Venous thromboembolism remains a common cause of morbidity and sometimes cause of death in surgical practice. In developed world about 10% of hospital deaths are due to pulmonary embolism resulting from deep vein thrombosis (DVT). DVT in Asian countries is not a rare condition.

**Objective:** The purpose of the study was to find the incidence, demographic character and risk factors of deep vein thrombosis.

**Methods:** 150 patients undergoing emergency or elective operation of more than one hour of duration was selected for study. Patients evaluated by history, clinical examination and duplex scan. Collected analyzed by computer program.

**Results:** 102 cases were male and 48 cases were female. The incidence of DVT in male was 36.3% while among females it was 27.5%. venous thrombosis in age group above 50 yrs is quite high, (43.33%). One-fifth of the DVT patients were smokers. Longer duration of operation procedure was correlated with development of DVT and development of DVT was little higher in emergency operation than elective one. The occurrence of the condition in some co-morbid states especially diabetes mellitus (36.7%) and cancer (33.3%) is noteworthy. Out of 51 DVT patients more than 84% developed sub-clinical DVT.

**Conclusion:** In Bangladesh it is assumed that DVT is rare. But the current study reveals that the incidence of postoperative DVT in Bangladesh is not that much rare event.

**Key words:** Venous thromboembolism, deep vein thrombosis, venography.

#### Introduction:

Thromboembolism is a wide spectrum entity of which post operative Deep Vein Thrombosis (DVT) is a part. In Bangladesh it is commonly believed that DVT is rare. At present there is inadequate information

available regarding the incidence of DVT. Moreover in post-operative deaths in our country, autopsy evidence of cause of death is lacking due to Asian aversion to diagnostic postmortem examination.

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The diagnostic tests like venography and color doppler for DVT are not available in many centers and are expensive in those centres where available. Venous thromboembolism remains a common cause of morbidity and sometimes cause of death in surgical practice. In developed world about 10% of hospital deaths are due to pulmonary embolism resulting from DVT<sup>1</sup>. The pooled data incidence of DVT following General surgery in Europe is 30% and in North America is 60%<sup>2</sup>. Without prophylactic anticoagulant, the frequency of DVT after total hip replacement is high, in the range of 50-60%. According to Royal College of Surgeons of England in every 1000 operations 100 develop DVT, 10 pulmonary embolism, 1 death<sup>3</sup>. DVT in Asian countries is not a rare condition and it was also found that 62.5% patients showed venographic evidence of postoperative DVT<sup>4</sup>. Postoperative DVT remains silent in 80% of the cases. Recent study in Malaysia and Korea shows that the incidence of DVT following total hip and knee replacement in the absence of thromboprophylaxis is approaching that in Western populations. The clinical diagnosis of DVT is less reliable and needs to be confirmed by the objective tests. Venography is considered to be the gold standard but has been replaced in years by colour Doppler study as the routine imaging modality in many centres<sup>5</sup>.

#### Materials and method:

This prospective cross-sectional study was carried out at BIRDEM Hospital from March 2008 to December 2008. Systematic random sampling technique was applied to select cases for this study. Total number of patients was 150. Any emergency or elective operation of more than one hour of duration was considered for inclusion. The other inclusion criteria were age > 20 years, and both general and spinal anesthesia. Past histories of DVT or patients on anti-coagulant therapy were the notable exclusion criteria. Clinical findings data on leg pain and calf tenderness, fever, prominence of superficial veins, leg and retromalleolar oedema were collected. Duplex scan was performed on 3rd to 8th post operative day to see compressibility, absence of signals on colour flow imaging and diminished or absence of velocity of flow on pulse analysis.

#### Results:

It is evident from the study findings that chance of having venous thrombosis in age group above 50 yrs is quite high, (43.33%) in contrast to other age groups. Among 150 study population, 102 cases were male

and 48 cases were female. The incidence of DVT in male was 36.3% while among females it was 27.5%. One-fifth of the DVT patients were smokers. No significant difference was noted between patients' occupation and development of DVT (Table 1) Thirty two patients underwent amputation (above knee and below knee) of which 14 (43.75%) developed DVT. Among the DVT cases, only 3 were clinical DVT and the rest were sub-clinical. Incidence of DVT was higher in above knee amputation than that of below knee. Laparotomy was done in cases of 20 patients of which 10 (50%) patients developed DVT. About one-fourth of the hernioplasty patients developed DVT. Half of the APR patients (4, out of 8) eventually developed the condition. The operation related percentages is shown in table 2. It is clear from the table that longer duration of operation procedure was correlated with development of DVT and development of DVT was little higher in emergency operation than elective one. This inference was also applicable to patients who underwent spinal anesthesia. The occurrence of the condition in some co-morbid states especially diabetes mellitus (36.7%) and cancer (33.3%) is noteworthy. Forty percent of the obese patients developed the condition in question (Table 3). Out of 51 DVT patients more than 84% developed sub-clinical DVT. Those who had higher platelet count suffered more from the condition (Table 4).

**Table 1**  
Demographic characteristics of the patients

Variables	No. of patients	DVT	% of DVT
<b>Age group</b>			
20-30 years	42	12	28.57
30-50 years	78	26	33.32
>50 years	30	13	43.33
<b>Sex</b>			
Male	102	37	36.27
Female	48	14	27.50
<b>Occupation</b>			
Service	52	22	42.30
businessman	24	9	37.50
House wife	41	12	29.26
Driver	8	3	37.5
Day labour	10	2	20.0
Student	5	1	10.0
Farmer	10	2	20.0

**Table 2**  
Operation related variables

Variables	No. of patients	DVT	% of DVT
Name of operation			
Amputation	32	14	43.75
Laparotomy	20	10	50
Hernioplasty	34	8	23.52
APR	8	4	50
Rt. hemicolectomy	14	6	42.85
Partial gastrectomy	8	3	37.50
Lap. Cholecystectomy	24	4	16.66
Open Cholecystectomy	10	2	20
Duration of operation (min)			
60-90	68	14	20.58
91-180	64	28	43.75
181-240	18	9	50.0
Type of operation			
Elective	130	39	32.5
Emergency	30	12	40.0
Types of anaesthesia			
General	108	33	30.55
Spinal	42	18	42.85

**Table 3**  
Distribution of the patients by risk factors

Risk factors	Total patients having risk	No of patients with DVT	% of DVT
Diabetes	60	22	36.66
Malignancy	30	10	33.33
Obesity	20	8	40.0
Pregnancy	2	1	50.0
COPD	5	2	40.0
Smoker	24	5	20.83
Contraceptive	9	3	33.33

**Table 4**  
Some clinico-pathological findings of the patients

Characteristics	No of patients with DVT	% of DVT
Platelet count		
< 4 lacs	32	30.47
>4 lacs	19	42.22
Types of DVT		
Silent	43	84.32
Clinical	8	15.68

### Discussion:

The current study was designed to see the frequency of postoperative DVT in general surgical patients in BIRDEM hospital where DVT prophylaxis is not a routine practice. Total 150 patients over 20 years of age have been studied by systematic random sampling irrespective of sex, type of anaesthesia, type, nature of operation, whether elective or emergency. The incidences of DVT reported in some studies on orthopaedic patient were 53.3% (Hong Kong), 4% (Thailand), 10% (korea) and 9.7% (Singapore). Estimated incidence of DVT following general surgical procedure is 30% in Europe 2 and 60% in North America. The current study shows that 51 patients out of 150 developed postoperative DVT. The incidence of postoperative DVT here in this study is 34%. This study has revealed that the incidence of postoperative DVT is approaching to western findings. It is found that DVT remain silent in about 80% cases in western set up 6. Here in this study 8 cases developed clinical DVT (15.68%), whereas the 43 cases were silent (84.32%) which correlates with the western findings. Many factors contribute to high incidence in this study. There is a significant association between increasing age, presence of DM, chronic kidney disease, heart failure, malignancy, duration of operation and a higher incidence of DVT in the present study. The current study shows that the postoperative DVT in age group above 50 years is 43.33% and 30-50 years age group 33.32% and 20-30 years age group 28.57%. So with the increasing of age, incidence of DVT is also increased. Daniel - Clarke- pearson 7 at Duke University Medical centre revealed that patient age was among the most important risk factors for development of post operative DVT. They showed that women aged 60 faced almost twice the risk of women aged 40. Duration of operation is considered as an important risk factors for development of DVT. Daniel-clarke-pearson showed in their study, when operation is more than 300 minutes, the risk is 32%, the risk is 14% for operations with duration of 120 to 300 minutes. Current study shows incidence of DVT is 50% (9 out of 18) when operation time is 180-240 minutes, 43.75% (28 out of 64) when time is 90-180 minutes and 20.58% (14 out of 68) when duration is 60-90 minutes. So it can be said the incidence increases with increasement of longevity of operation. Type of surgery is another influencing factor for DVT. Lee Fu, Chow Leung has shown a study in china that incidence of DVT after APR is 41.1% 8 and 20% after partial gastrectomy and 25.8% after amputation. Daniel - Clarke-pearson shown 88% risk after pelvic exenteration and 40-80% after radical prostatectomy. In my study, higher incidence of DVT has been seen in

APR (50%), laparotomy (50%), Amputation (43.75%), Rt hemicolectomy (42.85%), Partial gastrectomy (37.50%) and lower incidence seen in Hernioplasty (23.52%), cholecystectomy (20%). In this study, Incidence of DVT in male patients is 36.27% and in female patients 27.50% i.e. higher incidence is seen in male patients. According to this study, higher incidence is seen after emergency operation (40.11%) than elective operation (32.5%). Emergency patients have had prolonged immobility, multiple risk factors which have contributed higher incidence. In this series, incidence of DVT after spinal anaesthesia is 42.85% and after general anaesthesia is 30.55%. Higher incidence is seen in spinal anaesthesia group. In this series, incidence of DVT in diabetic patients 36.66%, in malignancy 33.33%, in obesity 40%, in pregnancy 50%, in COPD 40%, in smoker 20.83%, in patients taking contraceptive 33.33%. In this series, one patient died due to pulmonary embolism.

**Conclusion:**

In Bangladesh it is assumed that DVT is rare. But the current study reveals that the incidence of postoperative DVT in Bangladesh is not that much rare event. This study will help to change our outlook regarding the prophylaxis and management of DVT in postoperative patients and thus preventing the complications in those groups of patients who are at risk of developing DVT.

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