



## Screening for Deep Vein thrombosis and pulmonary embolism in bed ridden patients in a tertiary care hospital in Central India

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### Abstract

**Introduction:** Venous thromboembolism (VTE) is a common and potentially life threatening condition. Among cardiovascular diseases VTE is third most common cause of death. Many studies done in western countries have shown this condition to be very common. Studies done in Asian countries showed that this condition is not uncommon in asian patients as was thought earlier. Hence this study was planned to evaluate incidence of deep vein thrombosis (DVT) and pulmonary embolism (PE) in bed ridden patients.

**Materials and Methods:** This was an observational study in which 200 patients who were bedridden for more than 3 days were enrolled. All the routine examination like coagulation profile, D-Dimer, venous colour Doppler, and CT angiography was done. Data analysis was done using SPSS software. Data was expressed as mean  $\pm$  SD. P value  $<0.05$  was considered significant.

**Result:** Mean age of patients in the study was  $43 \pm 14$  out of which 117 were female and 83 were male subjects. Mean D-dimer value of patients in the study was  $714 \pm 80$ . Out of 200 patients enrolled in the study 42 patients had DVT and 14 patients had PE.

**Conclusion:** As observed in the study there is high a risk of developing DVT and PE in the patient even if the patient is non- ambulatory for 3 days. Thus bed ridden patients should be screened for DVT, also anticoagulation should be started in such patients prophylactically.

**Keywords:** Deep Vein Thrombosis (DVT), Bed ridden patients, Venous thromboembolism (VTE).

### Introduction

Venous thromboembolism (VTE) is a common and potentially life threatening condition which is under diagnosed and undertreated. The risk of venous thromboembolism is especially high in hospitalized non-ambulatory patients.

It is one of the commonest causes of unplanned readmission and preventable death<sup>1</sup>. About one-third of patients with symptomatic VTE lead to pulmonary embolism whereas two-third patients manifest as deep venous thrombosis (DVT)<sup>2</sup>.

Venous thrombo-embolism (VTE) has traditionally been considered to be rare in Asia. Most of the available data on VTE are of Western origin. This may be attributed to a paucity of published literature on VTE from Asian countries. In developed countries the incidence is one case of DVT and 0.5 cases of PE per 1000 population per year<sup>3,4</sup>. In recent times, there have been studies from Asia documenting an increasing incidence of VTE<sup>1,4</sup>. The incidence is between 15.8 and 17.1 per 10 000 hospital admissions in Asian

countries<sup>5</sup>. The incidence of VTE is presumed to be low in India as well as other Asian countries as compared to Western countries. This could partly be due to low awareness of VTE. It may also be that Asians are less prone to thrombosis, as has been traditionally believed. Bedridden patients are more predisposed to these conditions. Most studies on thromboembolic diseases were done in western countries but there is lack of data from India regarding incidence of VTE. Hence in this observational study we tried to evaluate the incidence of DVT and pulmonary embolism in bed ridden patients.

### Methods and Materials

This was a Hospital based observational study carried out in the department of General Medicine

at Gandhi Medical College and associated Hamidia Hospital, Bhopal.

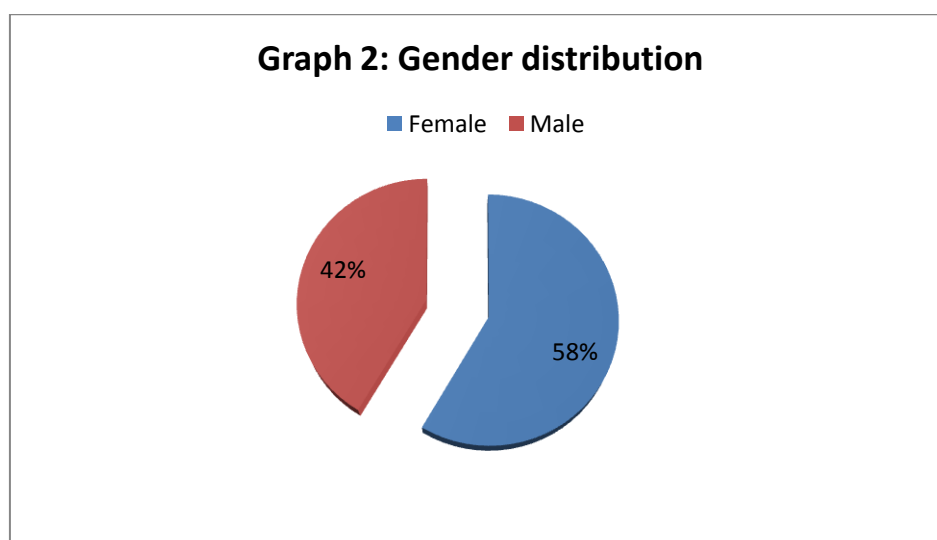
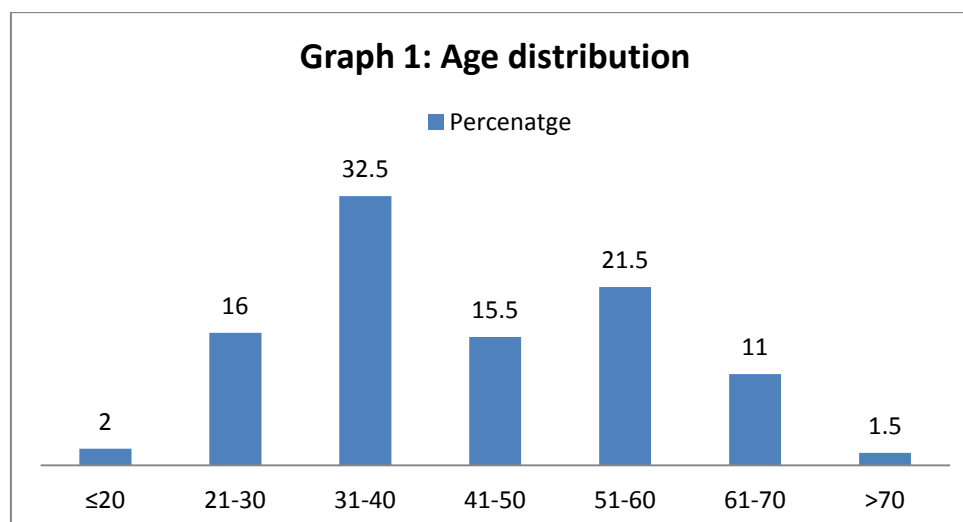
**Sample Size:** In this study 200 patients were studied

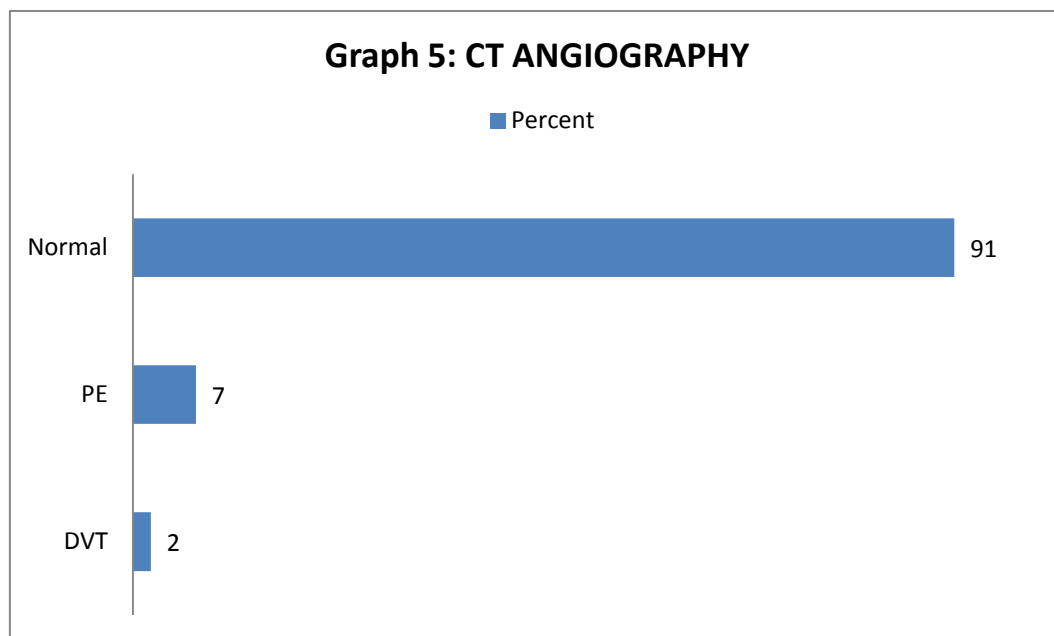
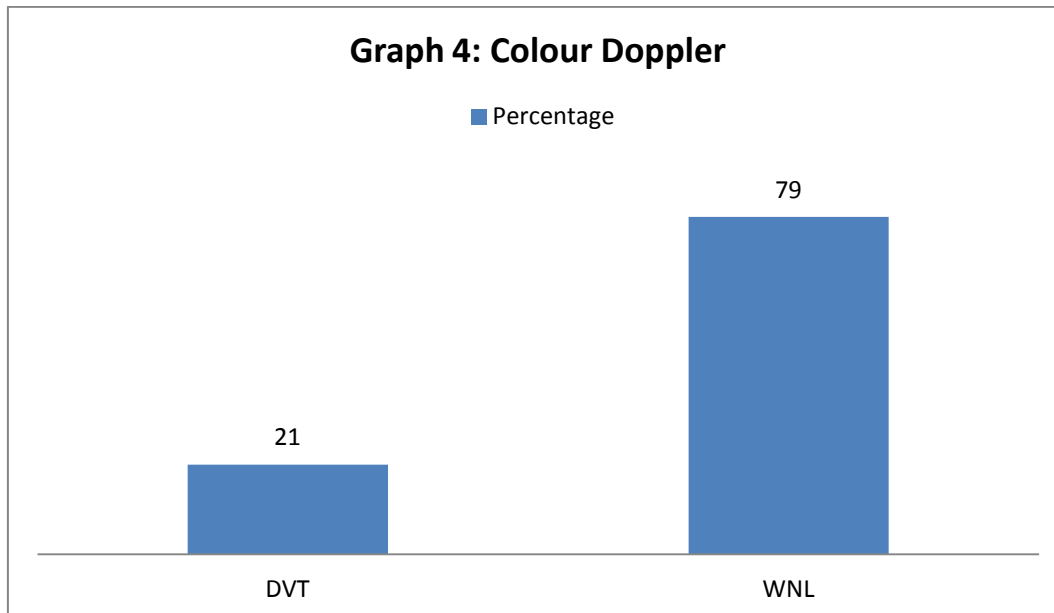
**Inclusion Criteria:** Patients who were bed ridden for 3 days were enrolled after taking informed consent and they were interviewed and examined in detail.

**Exclusion Criteria:** those who did not give consent, or did not fulfil inclusion criteria.

**Approach to data collection and analysis:** After taking due consent, their detailed history, demographic data and clinical examination of patients, they were subjected to routine blood investigations, PT/INR, D-dimer, color Doppler of both lower limb and pulmonary CT Angiography.

### Results





Mean pulse, RR, SBP and DBP was  $84.40 \pm 8.9$ ,  $22.05 \pm 3.23$ ,  $121.91 \pm 15.51$  and  $73.92 \pm 5.83$  respectively. Mean PE and D DIMER was  $1.27 \pm 0.32$  and  $714.71 \pm 80.9.53$  respectively.

### Discussion

In this study patient's age ranges from 20-70 years of which maximum no. of patients were in age group 31-40 years. Mean D-dimer and INR values in the study population was  $714.71 \pm 81$  and  $1.27 \pm 0.32$  respectively. Color Doppler revealed that 21% patients had DVT where as 7% patients were found to have pulmonary embolism on pulmonary CT angiography. These results are in agreement

with some other studies<sup>5,6,7</sup> conducted in India and abroad. Incidence of VTE is high in patients who were bed ridden for 3 or more days. Thus screening is recommended in bed ridden patients to decrease morbidity and mortality from these conditions. Also prophylactic anticoagulation therapy is indicated in such patients as it is expected to reduce the incidence of DVT and pulmonary embolism in such patients.<sup>5,6,7</sup>

In this study most of the patients were in the age group of 31-40 years [65 (32.5%)] followed by 51-60 years [43 (21.5%)]. Naqvi et al reported that mean age of patients was  $34.5 \pm 11.5$  (range 13–69 years) and that most common age group in our

study was 20–30 years (33.79%), due to high number of postpartum patients presenting with DVT<sup>6</sup>. In present study mean age of study cohort was  $43.37 \pm 14.19$  years while Lee et al reported that mean age was 45.1 years and ages ranged from 3 to 78 years. Borde et al reported that in the DVT group, the mean age was 43 years, ranging from 19 to 70 years<sup>6-8</sup>

In present study majority of the patients were female [117 (58.5%)] followed by male [83 (41.5%)]. In a similar study by Lee et al reported that men constituted 48% and women 52%<sup>5</sup>. Naqvi et al reported that the male:female ratio was 83/210 (2:5)<sup>6</sup>. Borde et al studied the incidence of deep venous thrombosis in 273 bedridden patients and reported that there were a total of 171 male (62.6%) and 102 female (37%) patients.<sup>7</sup> Among patients who developed DVT, the female subjects constituted 57.6% and the males ones, 42.4%.

In present study, colour Doppler revealed that 42 (21%) patients had DVT. That means incidence of DVT in present study population was 21% in Doppler findings. CT ANGIOGRAPHY revealed that out of 200 patients 4 (2%) had DVT and 14 (7%) patients had PE. Incidence of DVT in angiography was 2%. Dhillon et al. in a prospective study of 88 patients from Singapore without any prophylaxis, reported that 62.5% of the patients demonstrated venographic evidence of DVT.<sup>11</sup> Ko et al. in a prospective study of 80 'low-risk' Chinese patients undergoing total knee arthroplasty (TKA) and total hip arthroplasty (THA) showed 27-31% incidence of post operative DVT detected by duplex sonography<sup>13</sup>. Both the studies suggested that the present practice of withholding routine prophylaxis against thromboembolism in Asian patients labeled 'high-risk' should be reconsidered.

Angral et al showed that Five patients with distal DVT did not show evidence of further propagation of thrombus on repeat Doppler study. In fact, there was resolution of thrombosis in all the patients.<sup>14</sup> In agreement to that we found in colour doppler we found an incidence of 21% of

DVT, confirmation was done by ANGIOGRAPHY which revealed the incidence of DVT to be 2% only. Angiography also revealed that 7% patients had PE. which is contrary to the study done by Angral et al which showed that none of the patients developed clinically evident P.E. while in hospital or during first six weeks following surgery or hospitalization.

Our results are also in accordance with the study done by Mavalankar et al. who reported that DVT was detected in only nine patients out of 125 by duplex ultrasonography. Out of these nine patients, only three patients had evidence of proximal DVT while the remaining six patients showed distal DVT<sup>21</sup>. All these authors concluded that DVT has a lower incidence in Indian patients as compared with other ethnic groups.<sup>15</sup>

In present study out of 4 DVT patients in CT angiography, all were female whereas out of 14 PE patients, maximum were males (n=8) (p=0.027). Angral et al did a prospective study over a period of 3 years including 150 patients (average age 55 years) to determine the incidence of DVT in bedridden patients and reported that out of 150 patients DVT was detected in 10 patients (5 males; 5 females) with average age 51.5 years<sup>3</sup>.

In our study, all female patients were involved with DVT as compared to male. Borde et al reported that male subjects constituted 62% and 65% of patients in the DVT and non-DVT groups, respectively. 37.4% female subjects developed DVT and 34.6% did not develop DVT.<sup>5</sup> There was a significant increase in the incidence of DVT among the female as compared to the male (P = 0.025) patients.<sup>5-8</sup>

The Wells Clinical Prediction Rule state that patients who were recently bedridden > 3 days, or major surgery within 12 weeks requiring general or regional anaesthesia have higher incidence of DVT and for such patients score one is given. In present study mean wells scores and Geneva score was  $0.03 \pm 0.18$  and  $0.23 \pm 0.86$  respectively.<sup>16,17</sup>

**Conclusion**

As observed in the study there is high a risk of developing DVT and PE in the patients even if the patient is non- ambulatory for as less as 3 days. Thus bed ridden patients should be screened for DVT, along with keen observation of the patients. Also anticoagulation therapy should preferably be started in such patients prophylactically, so as to improve outcomes.

**Conflict of Interest:** None

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