Venous Thrombo-embolism in India

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Abstract

Introduction: Venous thrombo-embolism (VTE) has traditionally been considered rare in Asia. Recent reports from Hong Kong and Singapore indicate an increasing incidence of VTE. Objectives: To determine the incidence of VTE among hospitalised patients and study the predisposing factors and hence to increase the awareness of the need for VTE prophylaxis.

Methods: This is a retrospective study carried out on all patients diagnosed with VTE between 1996 and 2005 at our hospital. In-patient records were used to collect data while out-patient records were used for follow-up outcomes.

Results: The incidence of VTE was 17.46 per 10 000 admissions. Malignancy (31%) was the most common predisposing factor, followed by postoperative status (30%). The incidence following surgery was five per 10 000 operations. General surgery patients had the highest incidence of deep vein thrombosis (DVT; 40.3%), while the incidence in orthopaedic patients was 20.1%. Low-molecular-weight heparin (LMWH) has been increasingly used therapeutically over the years. Pulmonary embolism was diagnosed in 14.9% of the study patients. Mortality in those with confirmed pulmonary embolism was 13.5%.

Conclusion: VTE is no longer a rarity in India. General surgical operations are the most common causes of postoperative DVT. Pulmonary embolism continues to be ‘suspected’ more often than it is diagnosed.

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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 recent times, there have been studies from Asia documenting an increasing incidence of VTE.1–3 The incidence is between 15.8 and 17.1 per 10 000 hospital admissions from Hong Kong and Singapore,4,5 as compared to an incidence of 130 per 10 000 hospital admissions in the USA.6 The latter data include VTE developing during hospital admission. However, there are reports claiming that VTE is uncommon in Indian patients.7 The objective of this study was to determine the incidence of VTE in a referral and teaching hospital in India.

Methods

A retrospective study was carried out in the Christian Medical College, Vellore, India, from January 1996 to
December 2005. Patients were identified from a computerised database of all in-patient diagnoses classified based on the International Classification of Diseases (ICD) code (1-89). The in-patient records were used to collect data, while the out-patient records were used to determine follow-up and outcomes. The collected data were categorised into predisposing conditions, clinical details of the episode of VTE and follow-up. Deep vein thrombosis (DVT) was suspected based on the clinical criteria of limb pain and swelling. We did not use Wells’ criteria. DVT was diagnosed by duplex ultrasonography, based on the presence of a thrombus seen on B-mode imaging, compressibility of the veins, respiratory phasicity and augmentation response. Proximal DVT was taken to be DVT involving the popliteal vein and the veins above this level. Cortical venous thrombosis refers to thrombosis in a cortical vein in the brain. Pulmonary embolism (PE) was diagnosed using a combination of computed tomography (CT) angiogram, ventilation–perfusion (VQ) scan, D-dimer, electrocardiogram (ECG) and chest radiograph. Not all of these investigations were performed in every case. A diagnosis of confirmed PE was made on the basis of these investigations. Diagnosed PE included the above group as well as the post-mortem results of those suspected to have had PE.

Results

During this period, of the total 438,667 admissions, 722 were diagnosed with VTE, with an incidence of 17.46 per 10,000 admissions. However, as seen in Fig. 1, the incidence increases over time and stabilises at about approximately 22 per 10,000 admissions.

General Patient Characteristics

Men constituted 48% and women 52% of this group. Mean age was 45.1 years and ages ranged from 3 to 78 years. Forty-five percent of the patients had primary DVT while 55% had secondary DVT. There were no significant age or sex differences between primary and secondary DVT. However, as expected, patients were older in the secondary DVT group (36.8 vs. 51.8 years).

Malignancy and surgery were the major contributors to secondary DVT (Table 1). The malignancies included carcinoma cervix (31%), intra-abdominal malignancies (19%), urological malignancies (17%), germ cell tumours (15%) and others (18%). During the study period, 236,532 operations were conducted, including day-care operations. Of these, 119 patients had DVT. The incidence due to surgery was five per 10,000 operations. It is significant that none of the 119 patients who developed postoperative DVT had received prophylaxis for DVT. The distribution of DVT, according to specialty, is shown in Fig. 2. The mean hospital stay was 11.4 days (primary VTE = 10.5 days, secondary VTE = 12.2 days).

As listed in Table 2, 60% of the patients had proximal-lower-limb DVT; 95% of the DVT was diagnosed by duplex ultrasonography and 4% of the patients were diagnosed based on clinical suspicion and D-dimer study. These were critically ill patients, who were admitted to the intensive care units, and were treated during the earlier part of the study when portable ultrasound was not available in the hospital. Anticoagulation alone was used to treat 98% of the patients. Six patients received thrombolysis, while nine patients had inferior vena cava filter (IVC) inserted. A thrombolysar was installed at our institution in 2004, and only those ilio–femoral DVT patients who could afford the cost of thrombolysis were treated. Patients contraindicated for anticoagulation or those with advanced disease progression despite anticoagulation were treated with IVC filter, again based on affordability. No patient underwent surgical thrombectomy. An interesting aspect revealed by the study was an increase in the therapeutic use of low-molecular-weight heparin (LMWH) over time (Fig. 3). The mortality in patients with VTE was 13% (95 patients). Of these, majority (76 patients) were in the secondary VTE group (80%), while 107 of the 722 patients with VTE were diagnosed to have PE (14.9%). Of these, only 52 patients had confirmed PE (48.5%) — PE was confirmed by CT angiography in 44.2%, VQ scan in 26.9% and by D-dimer study/ECG/chest radiograph in the remaining 28.8%. The mortality in patients with PE was 50% (53 deaths). In the subset of patients who had confirmed PE, mortality was only 14% (seven patients).

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignancy</td>
<td>31</td>
</tr>
<tr>
<td>Postoperative</td>
<td>30</td>
</tr>
<tr>
<td>Other medical conditions</td>
<td>21</td>
</tr>
<tr>
<td>Haematological conditions</td>
<td>12</td>
</tr>
<tr>
<td>Others, including trauma</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1  Predisposing conditions

Figure 1  Distribution of VTE over time.

Figure 2  Distribution of DVT according to specialty. General surgery = 40.3%, Orthopaedics = 20.1%, Obstetrics and gynecology = 18.5%, Neurosurgery = 14.2%, Others = 9.5%.
Discussion

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. In our study, we had an overall incidence of 17.46 VTEs per 100,000 admissions. So far, no Indian study has been published that documents the overall incidence of VTE in hospitalised patients. Our study revealed the incidence of eight VTEs per 100,000 admissions in 1996, which increased to 24 per 100,000 admissions in 2005. This can be explained by the increased awareness of VTE in India as well as the advent of better diagnostic modalities, such as duplex ultrasonography becoming more readily available and accepted. There was no alteration in the incidence between men (48%) and women (52%). The incidence of proximal DVT was 60.7%, while that of distal DVT was 33.6%. In a study by Ng et al., the incidence of proximal DVT was found to be 61.8% and that of distal DVT was 38.2%. The statistical results for DVT site were generally comparable to current published statistics, with proximal-lower-limb DVT being present in 60.7% of our patients. Among the predisposing conditions for VTE, malignancy (31%) and post-operative status (30%) were the major contributing factors. In a study by Cushman et al., the incidence of DVT secondary to malignancy was 25%, while White reported an incidence of 18%. Among the malignancies, carcinoma of the cervix had the highest incidence (31%). The high incidence of carcinoma cervix in India could be a possible explanation for the prevalence of DVT. Postoperative VTE has been the most common cause for VTE in many studies. However, in our study it was secondary to malignancy as the predisposing factor. Dhillon et al., in a prospective study from Malaysia, found a high incidence of DVT following orthopaedic surgery. Generally, orthopaedic surgery has a high incidence of VTE. However, in our study general surgerical operations were the most common postoperative predisposing factors for VTE (40.3%). In contrast to published data, incidence of VTE following general surgical operations is high in our study. Pooled data show the incidence of VTE following general surgical operations as being between 25% and 29%. Incidence of VTE following general surgery in Asian patients constitutes about 13%. There is a greater awareness regarding VTE among the general surgeons at our institution. The Department of Vascular Surgery, a part of General Surgery department, has been treating most VTE patients. We have been working at increasing the awareness of VTE among general surgeons for the last 10 years. This contributes to better clinical suspicion and earlier diagnosis among the surgical patients, as compared to orthopaedic patients. Many orthopaedic surgeons still believe that DVT is rare in India and rarer still in orthopaedic patients. They do not routinely investigate patients with lower-limb complaints for DVT. Ninety-eight percent of the patients with VTE were managed by anticoagulation alone, consisting of both unfractionated heparin (UFH) as well as LMWH. During the initial part of the study (1996–2000), UFH alone was used. The latter part of the study saw increasing use of LMWH for the treatment of VTE. This was attributed to better acceptance and ease of using LMWH. However, mortality from PE continues to remain high. In our study, the overall mortality for PE was 49.5% compared to 45.1% in the Western countries. It is interesting that the mortality is only 13.5% with early diagnosis of PE. Thus, high clinical suspicion of PE will lead to early detection and reduced complication rates. PE continues to be detected post-mortem in most hospitals in India.

This retrospective study is limited by lack of crucial data, such as details of prophylaxis, type of heparin used, mortality breakdown statistics, etc. With this study, we hope to establish better VTE prophylaxis and treatment at our institution.

Conclusion

DVT is an area of concern as it no longer is a rare phenomenon in India. General surgical operations are the most common cause of postoperative DVT and malignancy is the most common cause of secondary VTE. PE continues to be ‘suspected’ more often than diagnosed. Morbidity and mortality from VTE is a significant problem in India. DVT prophylaxis would reduce the incidence of VTE in India and bring down the mortality rates.

References

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