

Pattern of deep venous thrombosis in Jeddah area, Western Saudi Arabia

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Little is known about the pattern of Deep Vein Thrombosis in Saudi Arabia. Over 4 year period, 62 cases with strong evidence of venous thrombosis were studied in King Abdulaziz University and King Fahad Hospitals to learn the pattern of deep vein thrombosis in Jeddah, Western Saudi Arabia. There were 32 females and 30 males. The mean age of the group was 36.0 years (range 6-90 years). One or more risk factors was/were detected in 40 patients. Among these 14 factors, age more than 50 years, obesity, vasculitis, malignancy and postpartum were the common factors encountered. In other 22 patients, no risk factor was found. However, extensive laboratory search diagnosed 9 rare disorders out of these 22 cases. Antithrombin III, protein C, protein S deficiencies in 5, 2, 1 patients, consecutively. The last patient had significantly shortened PTT. The other 13 (21.0%) patients were considered real idiopathic DVT. Extremities were involved in 54 patients compared to only 8 cases with inferior vena cava or visceral thrombosis. The upper limb was affected in only 10 patients unlike the lower limb which was more commonly affected $n=37$.

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Deep vein thrombosis is a potentially fatal disease and associated with a high incidence of morbidity. About 100 years ago Virchow postulated that venous thrombosis may result from stasis, endothelial damage and hypercoagulation.¹ His triad is still practical in clinical practice particularly in developing countries with limited financial resources. Nevertheless, recent advances in the diagnosis, treatment and

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prophylaxis of deep vein thrombosis played an important role in the improvement of morbidity and mortality rates after venous thrombosis.

In our country, little is known about the pattern of deep vein thrombosis.² In this paper we aim to define the pattern of deep vein thrombosis in the Jeddah area, Western Saudi Arabia. Certainly, the final outcome of deep vein thrombosis patients is highly influenced by making an early and proper diagnosis. This necessitates a thorough knowledge of the different high-risk groups of patients, various methods of investigation and awareness about the rare clotting syndromes as locally seen in every country.

Diagnosis was documented by Doppler ($n=2$), nuclear venogram (32), conventional venogram (18) and others, e.g. CT laparotomy in 4 cases. A clinical diagnosis was made in only 6 patients. Deep vein thrombosis is a fairly preventable fatal disease if the underlying aetiological risk factors are understood as they are locally seen in each country. This study addresses the various patterns of this disease particularly in Saudi Arabia.

Patients and methods

During the period March 1988 through February 1992, all patients, with clinical evidence of deep venous thrombosis were studied to define the pattern of venous thrombosis in the Jeddah Area. The cases were collected from two major hospitals in Jeddah, namely the King Abdulaziz University Hospital located in the South of the city and draining about 500,000 population and

King Fahad Hospital located in the Northern part and draining about 700,000 population. All cases were examined by the two senior authors (vascular surgeon, haematologist). In every case one or more of the risk factors listed in table I were searched for and reported according to proposed definitions. Obesity was defined as an increase of more than 20% above the ideal body weight. Deep vein thrombosis occurring in patients above 50 years of age, those immobilized for more than 3 days and cases occurring within 10 days of delivery were considered as predisposing factors. If none of the listed factors was detected, deep vein thrombosis will be classified as idiopathic clinically and considered for extensive laboratory search. The clinical suspicion was confirmed by only Doppler ultrasound, nuclear venography, conventional venography and computed tomography or surgery in 2, 32, 18 and 4 cases, respectively. All venograms were reported by experienced radiologists while ultrasound was performed by the first author (HZ). Treatment was variable depending on the general condition of the patient. The majority of patients without contraindication to anticoagulation were started initially on heparin pump for 7 days and changed later to oral anticoagulant for 3-9 months. Aspirin was used in other patients in 300 mg doses.

Results

Over a 4 year period a total of 62 cases with evidence of deep venous thrombosis were seen. There were 30 males and 32 females; a ratio of 1:1.06. The mean age of the group was 36.0 years with a wide range varying from 6-90 years. The frequencies of different predisposing risk factors are shown in table I. Age more than 50 years, obesity, vasculitis, malignancy and postpartum were the common factors encountered. More than one factor was found in eight patients. In the postoperative group only one case followed orthopaedic procedure. Systemic lupus erythematosus (SLE) accounted for 4 patients while Behçet's disease was responsible for the other 3 patients in the vasculitic group. Twenty-two cases were diagnosed initially as idiopathic venous thrombosis. However, extensive laboratory search diagnosed 9 rare disorders out of

TABLE I.—*Risk factors in 62 deep vein thrombosis patients.*

Risk factors	N.	(%)
Age > 50 years	19	30.5
Obesity	9	14.5
Vasculitis	7	11
Postpartum	6	9
Malignancy	6	9
Postoperative	5	7
Cardiac	5	7
Immobility	3	4.5
Infection	3	4.5
Smoking	3	4.5
Polycythaemia	2	3.25
Hormonal therapy	2	3.25
Compression	1	1.5
Varicose veins	1	1.5
Idiopathic	22	35.5
*More than one factor	8	13

TABLE II.—*Distribution of deep vein thrombosis in 62 patients.*

Site	N.	(%)
1) Extremities	54	
— Upper unilateral	10	16
— Lower unilateral	37	60.5
— Bilateral	7	11
2) Central	8	
— Mesenteric	4	6.5
— IVC	3	4.5
— Hepatic	1	1.5
Total	62	(100)

the 22 patients. Antithrombin III, protein C and protein S deficiencies were detected in 5, 2 and 1 patient, respectively. One more patient had shortened PTT. The other 13 (21%) patients were considered real idiopathic deep vein thrombosis. The distribution of sites affected by deep vein thrombosis is listed in table II. Extremity veins were involved more commonly than central vessels e.g. mesenteric, inferior vena cava, hepatic veins. When deep vein thrombosis involved extremities it was encountered more in lower limbs (n=44) while upper limb was less common (n=10). Furthermore, in the lower limb

group unilateral disease was seen in 37 patients unlike bilateral disease which occurred in only 7 patients. Overall, there was no significant side (i.e. right or left) selection in both upper or lower limb cases. Only 15 cases were diagnosed as distal deep vein thrombosis, i.e. leg or thigh veins. The remainder of lower limb cases (n=29) were due to iliofemoral thrombosis. The clinical suspicion was confirmed by Doppler ultrasound (n=2), nuclear venography (32), conventional venography (18), and others, e.g. CT or laparotomy in 4 cases. The diagnosis in 6 patients was not confirmed by laboratory measurement for logistic and/or clinical reasons. In the whole group evidence of pulmonary embolism was demonstrated in 11 cases. During admission, 5 patients expired. The cause of death in the expired patients was pulmonary embolism in only 2 patients and indeed those 2 patients presented with pulmonary embolization. None of our patients was considered a good candidate for venous thrombectomy and surgery was undertaken for only excision of infarcted bowel in case of mesenteric venous thrombosis. Otherwise, patients were treated conservatively in a standard fashion with anticoagulation. Exceptionally, 4 patients were treated with aspirin 300 mg daily. In the whole series, 11 patients (17.7%) had previous history of one or more attack of deep vein thrombosis and were considered as a recurrent deep vein thrombosis. Unfortunately, the attendance of patients for follow-up was poor and therefore it may be difficult to comment on the late sequelae of deep vein thrombosis.

Discussion

Approximately 170,000 new cases of clinically recognized venous thromboembolism inpatients are treated in short stay hospitals in the United States each year and 99,000 hospitalizations for recurring disease.³ In contrast, the incidence of deep vein thrombosis is unknown in Saudi Arabia. In this study, an average of 16 cases only were seen annually in Jeddah in 2 large hospitals draining a population of about one million. This is definitely a very low incidence if compared with an incidence of more than 500/1 million in the United States.³ The very variable geographical distribution of vein throm-

bosis between temperate and tropical areas was recognized a long time ago.^{4 5} In our country, Mufti² found an incidence of 13.6% of deep vein thrombosis after major abdominal surgery which is again significantly lower than temperate regions but higher than Southeast Asia.⁶ Nevertheless, an interesting similar Australian study found that the geographical variation of post operative deep vein thrombosis may have been overestimated in previous reports and may be partly due to variations in screening techniques.⁷ In view of these conflicting data we feel that deep venous thrombosis is a multifactorial disease and one may find it difficult to compare different reports in the literature due to variation in the design of studies. Certainly, the lack of diagnostic methods in developing countries contributed to the underestimation of this fatal disease.

There was no relationship between thrombosis and sex in our study and this compared favorably with similar studies in the literature.⁸ Identification of the patients at greater risk is essential in making early diagnosis and perhaps screening of our patients. We found that old age, obesity, malignancy, and childbirth are the commonest risk factors. This was followed by vasculitic disorders particularly SLE and Behçet's syndromes. The latter is well described in our area⁹ and must be taken into consideration particularly in young deep vein thrombosis patients. The low incidence of post operative deep vein thrombosis in our series may be explained by the referral pattern as we got only the obvious dramatic cases. Definitely, a higher incidence is expected if one uses screening methods as demonstrated in other studies.^{2 4} Deep vein thrombosis associated with malignancy and myocardial ischaemia is well described in the literature^{10 11} and was detected in 10 of our patients. Prior to labelling the case as idiopathic deep vein thrombosis a careful search for the rare congenital clotting disorder should be done particularly in young patients with recurrent deep vein thrombosis and no obvious risk factors. Adopting this policy we managed to diagnose 8 uncommon cases. Antithrombin III deficiency was encountered in 5 patients. It is one of the common inherited hypercoagulable states with an

incidence as high as 1 in 2,000.¹² It is manifested by a spontaneous onset of deep vein thrombosis in the second decade.

Patients usually require higher doses of heparin as they have heparin resistance. Another 2 patients had protein C deficiency which is again uncommon with an incidence of 4-5%¹³ and was first reported in 1981.¹² The last patient had protein S deficiency which has an incidence similar to protein C deficiency. The treatment of the latter two deficiencies involves the administration of fresh frozen plasma or factor IX concentrate. Anticoagulation is appropriate for chronic treatment.

Seasonal variation was reported in the literature,¹⁴ however, this was not the case in this series. Similar to other studies⁸ we could not find significant side selection in upper or lower limb deep vein thrombosis. Furthermore, our results compare favorably with other studies with regard to limb selection as upper limb was relatively rare compared to lower limb.⁸

The accuracy for clinical diagnosis of deep vein thrombosis is only 50%.¹⁵ Therefore, one must use other diagnostic tools to confirm clinical suspicion. Of the various methods available, contrast venography is the useful method and remains the standard against which all other various methods are compared. The inaccuracy of clinical diagnosis in one hand and the problems of venography on the other hand prompted the development of non-invasive techniques, like Doppler sonography, iodine-125-labelled fibrinogen scanning, various types of plethysmography, radionuclide venography and recently duplex scanning. Summer and Lambeth¹⁷ found that 94% of proximal deep vein thrombosis and 91% of isolated calf thrombi were detectable by Doppler examination in contrast to iodine-125-labelled-fibrinogen which is of limited value in proximal deep venous thrombosis although its accuracy is relatively high in calf thrombosis.¹⁷ In our series, we aimed to confirm our clinical suspicion in every patient by contrast venography. However, we managed to perform that in only 18 patients. Nuclear venography was widely used as a minimally invasive test in another 32 patients. The latter has the advantage of giving information about pulmonary embolisation in the same scan. Its accu-

cy varies between 89-96% in two early studies.¹⁶ We feel that it is good alternative to contrast venography if the latter is difficult to perform. Recently, the real-time B-mode and Duplex scanning was introduced in our hospital. Certainly, it is a promising test with an accuracy rate of 93-100%.¹⁸ A number of enthusiasts suggested that it should replace venography as the gold standard investigation. However, it is early to justify this conclusion as the ultrasonic screening is still an operator dependent method of investigation.

Finally, it is not our aim in this article to comment on the various methods of prophylaxis and treatment for the sake of brevity. Nevertheless, few points may deserve attention in our series in that regard. Firstly, none of our patients was a suitable candidate for surgical venous thrombectomy as we feel that it should be reserved for isolated patients. Present indications include phlegmasia alba dolens in young active patients and phlegmasia cerulea dolens in patients who do not respond immediately to heparin administration.¹⁶ Secondly, although we feel that treatment with anticoagulants is the standard medical treatment in venous thromboembolism, we have used aspirin exceptionally in four of our patients who had recent bleeding. Wu *et al.* have identified a subgroup of patients with recurrent deep vein thrombosis who appear refractory to conventional anticoagulations therapy.¹⁹ Finally, thrombolytic agents were not used in the whole series. These agents are promising particularly the recent introduction of tissue plasminogen activator (TPA). However, they have higher risk of bleeding and fairly expensive. Their role is still evolving and the justification for their general use in day-to-day practice needs to be defined as the reports in the literature are still contradictory.^{20 21} Certainly, heparin remains the agent of choice in treatment of thromboembolism.

In summary, deep vein thrombosis is fairly preventable fatal disease if the underlying aetiological risk factors are understood as they are seen locally in each country. In our country, a well designed prospective epidemiological study may be helpful in defining the incidence and the various high risk groups. An early and proper

diagnosis is mandatory once it is clinically suspected. In recent practice the new modalities in investigation and treatment should be used whenever possible.

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