AFRICAN JOURNAL OF MEDICINE and medical sciences

SEPTEMBER 2006

VOLUME 35 NUMBER 3

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Prevalence of venous thromboembolism at post-mortem in an African population: a cause for concern.

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Summary

Venous thromboembolism (VTE) remains a fatal complication and a frequent cause of death among patients hospitalized for remediable and often minor conditions. Various prevalence and associated risk factors of VTE have been documented in different parts of the world. It has been reported that the prevalence of VTE in Africans and Asians is not as pronounced as it is in the Caucasians. However, there is still a relative paucity of information about the prevalence of VTE and its associated risk factors in Nigeria, which is an African population. Data was collected retrospectively from records of post-mortem reports at the University College Hospital, Ibadan, Nigeria between January 1991 and December 1998. Of the 989 autopsies documented within the 8-year period, 29 autopsies confirmed VTE. This indicates a prevalence of 2.9%. Sixty five percent of the subjects were older than 40 years and male to female ratio was 2.6:1. Hence the condition is moré prevalent in males than females. Malignancy was the commonest predisposing risk factor for VTE (37.9%). Other predisposing factors included immobility for more than 4 days (27.6%), neuromuscular paralysis (24.1%), septicaemia (20.7%), multiple trauma involving the pelvis, abdomen and head (17.2%), major surgery (13.8%), congestive cardiac failure (3.4%) and obesity (3.4%). This study highlights the need to have a closer look at this grave but preventable and treatable health condition. VTE is a preventable and treatable condition, especially where haematological services, intensive care management and good pre-emptive physiotherapy are available. Thus, mortality from this condition should be considered as a cause for concern even in a poorly funded health care delivery system such as in Africa. It is therefore recommended that appropriate physical and pharmacological methods of prophylaxis should be prescribed according to the degree of risk of VTE in individual patients.

Keywords: Venous thromboembolism, pulmonary embolism, deep venous thrombosis

Résumé

Le thrombœmbolique veineux (TEV) reste une complication fatale et une cause fréquente de décès parmi les hospitalisés de diverses conditions. Plusieurs paramètres et de facteurs a risque au TEV ont été documenté de part et d'autre dans le monde. Mais moins prononcé chez les

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africains, indiens que la race blanche. Cependant il y a un manque relatif d'informations sur la prévalence du TEV et les facteurs a risque dans la population nigériane. Ces données ont été collectées au centre universitaire hospitalier, UCH, à Ibadan entre Janvier 1991 à Décembre 1998. Sur un total de 989 autopsies documentés pendant 8 ans, la prévalence du TEV était confirmé sur 29 (2.9%) d'autopsies.65 % des sujets avaient plus de 40ans et la proportion male / femelle de 2.6 : 1 ; avec une prédominance des males sur les femelles. La prolifération non-controllé des cellules était la cause la lus commune (37.7%). D'autre facteurs inclus l'immobilité de plus de 4 ans (27.6%), la paralysie neuromusculaire, La septicémie (20.7%), de multiple traumatisme du pelvis, abdominal et de la tête (17.2%). Cette étude illumine le besoin d'apporter une attention particulière vu la mortalité en Afrique bien que préventif et traitable condition de santé. Le TEV est préventif et traitable ou les services hématologiques, les soins intensifs et les soins thérapeutiques sont disponibles. Il est recommandé des méthodes physiques et pharmacologiques appropriées pour la prophylaxie soient prescrit vu la fréquence de risque du TEV aux patients.

Introduction

Homans described the relationship between deep venous thrombosis (DVT) and pulmonary embolism (PE) in 1934 [1], and since then venous thromboembolism (VTE) has been a well recognized major health problem [2,3]. PE is a frequent cause of death among patients hospitalized for minor conditions [4]. It has been estimated that 0.9% of all hospital admissions die of fatal PE [5] and in 90% of all PE cases, DVT of the lower limb is the predisposing condition [6].

Various prevalence rates of VTE have been documented depending on the study population. Reported rates of VTE from autopsies are 3.4% to 9.0% in United States [7], 12.8% in the United Kingdom [8] and 0.75 % in the Hong Kong Chinese population [9]. The difference in prevalence rates may be due to interaction of acquired environmental risk factors such as diet with several genetic predispositions. These risk factors could either be due to pre-existing patient factors such as prolonged immobility, or due to cardiac diseases such as atrial fibrillation, polytrauma or major surgical procedures especially involving the iliofemoral vessels, as demonstrated in a previous study from Ibadan by Okunade *et al.* (1998 [10]. Another study from Ibadan by Awotedu *et al.* (1992) revealed that in 3.8% of autopsies PE was a major contributing factor to death [11].

Prophylaxis against VTE has been reported to reduce the incidence of DVT by 66% and that of PE by 50% [12]. For this reason, adequate physical and pharmacological prophylactic measures should be put in place [11] especially in patients at high risk of VTE. This will reduce the morbidity and mortality associated with VTE. The dose, duration and intensity of both physical and pharmacological methods of prophylaxis should be prescribed according to the degree of risk of VTE.

The aim of the present study is to determine the prevalence of venous thromboembolism at postmortem as seen in the University College Hospital, Ibadan and identify the risk factors associated with VTE.

Methodology

Data was collected retrospectively from records of postmortem reports at the University College Hospital, Ibadan, Nigeria between January 1991 and December 1998. Information recorded included age, sex, clinical summary and provisional anatomical summary. All the data obtained were analysed using frequency distributions.

Results

Of the 989 autopsies documented within the 8-year period, 715(72.3%) were males while 274 (27.7%) were females ,giving a male to female ratio of about 2.6: 1.Of these 29 autopsies confirmed VTE. This indicates a prevalence rate of 2.9%. Sixty-five percent of the autopsies with VTE were in patients older than 40 years. The mean age of patients at autopsies with VTE was 42.2 years. See (Table 1).

Table 1: Age and sex distributions of patients with VTE

Age (years)	Male	Female	Total
0 - 19	0	1	1(3.5%)
20-29	2	0	2(6.9%)
30-39	6	1	7(24.1%)
40-49	5	0	5(17.2%)
50-59	3	2	5(17.2%)
60-69	3	1	4(13.8%)
70-79	2	3	5(17.2%)
	21 (72.4%)	8 (27.6%)	29(100%)
Male : Female	Rati 2.6	1	

Pattern of distribution of risk factors of VTE

The records of clinical summary and provisional anatomical summary revealed that malignancy is the commonest predisposing factor for VTE (37.9%) (Table 2). Others include immobility for more than 4 days (27.6%), neuromuscular paralysis (24.1%), septicaemia (20.7%), multiple trauma involving pelvis, femur, abdomen and head (17.2%), major surgery (13.8%), congestive cardiac failure (3.4%) and obesity (3.4%).

Table 2: The pattern of distribution of VTE risk factors

* Risk factors	Frequency (n)	% Frequency
Malignancy	11	37.9%
Immobility	8	27.6%
Paralysis	7	24.1%
Septicaemia	6	20.7%
Trauma	5	17.2%
Surgery	4	13.8%
Congestive cardiac		
failure	1	3.4%
Obesity	1	3.4%

* Some autopsies had more than one risk factor.

Pathological Criteria For Diagnosis of VTE

Following standard post mortem procedure the diagnosis of VTE is often based on finding clot in the popliteal and pelvic Venous plexuses.

Discussion

Various prevalence rates of VTE have been documented depending on the study population, while a variety of risk factors have also been reported in different parts of the world. Okunade *et al.* (1998) [10], observed that the high prevalence of VTE at post-mortem is a call for concern in the Nigerian population [10]. A prevalence of 2.9% was noted in this study, which is lower than the prevalence of up to 12.8% reported in Caucasians [7,8], but higher than that of 0.75% reported in Asian population [9] Awotedu *et al.* (1992) from Ibadan found a 3.8% post-mortem prevalence of PE [11]. The predisposing factors for PE highlighted by their study [11] included cancer, infection and congestive cardiac failure.

The lower prevalence of VTE in Africans and Asians may be partly explained by the observation that fibrinolytic activity in the blood is higher in Africans and Asians than in Caucasians [12-14]. This may be due to the interaction of various environmental and other acquired risk factors such as diet, climate and difference in life styles with several underlying genetic predispositions. Important contributory factors could also include pre-existing patient factors such as prolonged immobilization or underlying chronic diseases, multiple trauma or major surgical procedures [15].

This present study revealed that 65.5% of all autopsies with VTE were in subjects over 40 years. The risk of VTE is well known to increase with advancing age and it occurs more frequently after the age of 40 years [16]. This study also demonstrated a high proportion in males. The male to female ratio of 2.6:1 in the present study was lower than that of 1.4:1 reported in an earlier study from this environment [11]. This male predominance could be expected as males are usually more aggressive than females and many times engage in strenuous activities that may result in traumatic accidents with predisposition to VTE.

Patients with previous episode of VTE have an increased risk of post-operative DVT of over 50% [17] and it is even recommended that many of them should be placed on prophylaxis for life [18]. Patients with VTE under age of 45 years should be screened for causes of thrombophilia such as deficiency of antithrombin III, Protein C, Protein S, antiphospholipid antibody or lupus anticoagulant. Oral contraceptive therapies have been reported to have an increased risk of venous thromboembolism. However, a study by Farmer *et al* [19] in 2000 confirmed that the reduction in use of oral contraceptive therapy (from 53% to 14%) had no effect on the incidence of VTE among the women surveyed between 1993 to 1998.

In pregnancy, hormonal effects cause hypercoagulable state; relaxation of the vessel wall and mechanical compression of the left iliac vein at the pelvic brim and this may result in DVT. Pregnant women have a six-fold increased risk of VTE as compared to age matched non-pregnant women [20,21,22]. During the puerperium, the risk of thromboembolism may be further increased because of operative (caesarian or instrumental) delivery, prolonged bed rest after delivery and use of oestrogen to suppress lactation. The risk of dying from pulmonary embolism is much greater in older, multiparous women on bed rest [24], while obesity is an additional risk factor.

Critically ill patients are also at increased risk of VTE due to their pre-morbid conditions, admitting diagnosis and exposure to certain procedures in ICU such as invasive tests, drugs that potentiate immobility and central venous catheterization. DVT in the upper extremity is usually caused by central venous catheterization of intravenous ,drug [22,23] Hirsch *et al* (1995) [25] noted that all five upperextremity DVT seen in their prevalence study were associated with existing or prior central venous catheters.

Another risk factor of VTE documented is posttravel DVT. Reports about post travel DVT also known as the "Economy Class Syndrome" is very common. A number of factors in aircraft cabins have been reported to increase the risk of air travellers developing VTE. These include cramped seating positions, immobility, dehydration due to consumption of alcoholic drinks and other diuretics such as tea, and the presence of low humidity, reduced barometric pressure and relative hypoxia in the air- craft cabin.

Besides pharmacological methods already mentioned, physical methods of prophylaxis eliminate or reduce venous stasis by mechanical means. These mechanical mean encourage emptying of blood from venous valve pockets and increase the rate of blood flow in leg veins by intermittently squeezing the leg. Intermittent pneumatic compression enhances blood fibrinolytic activity. Hull *et al* (1990) [26] showed that sequential intermittent leg compression is effective in reducing the frequency of calf vein and proximal vein thrombosis following total hip replacement and further suggested that it would be prudent to commence leg compression pre-operatively and to continue this therapy beyond 14 days if the patient is confined to bed. This may be combined with anticoagulant prophylaxis (5,000 IU 8 hourly) to increase efficacy of prophylaxis in high-risk patients who have no contraindications to anticoagulant therapy [26]. According to a report by Ramos et al (1996) [27] a combination of intermittent pneumatic compression device with unfractioned heparin for cardiac surgery patients was a more effective prophylaxis than heparin alone for prevention of DVT. Active leg exercises and passive movement including passive motor-driven dorsiflexion of leg may also be carried out [28]. Anti-embolic stocking and elevation of bed end by 15-22cm should be considered in low risk patients. The limitations of physical methods of prophylaxis include, lack of compliance in some patients who find them either uncomfortable or irritable, cases of overt leg ischaemia or when their use is impracticable as seen in post orthopaedic surgery patients under traction

Generally, it is recommended that all patients admitted to hospital should be assessed for overall risk factors. The dose, duration and intensity of prophylaxis should be related to the individual patient risk for VTE. Prophylaxis may be given pre-operatively (5,000 IU 8 hourly) according to the individual patient needs. Continued prophylaxis after discharge should be considered in individual patients in consultation with the haematologists.

Conclusion

Venous thromboembolism (VTE) as a frequent cause of death is considered a very important and prophylactically treatable condition. The major risk factors for VTE revealed by this study were malignancy, prolonged immobility and neuromuscular paralysis. The prevalence of VTE should be a cause for concern for all those involved in the management of patients at risk for the condition. A multidisciplinary approach to treatment involving the haematologist, anaesthetist and intensive care physician and the physiotherapist is required for a successful outcome in all at risk patients. It is recommended that all patients admitted in hospital should be assessed for VTE risk factors and proactively treated prophylactically.

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Received: 29/07/05 Accepted: 22/08/06