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Epidemiology and risk factors for venous thromboembolic disease: a Senegalese study

Épidémiologie et facteurs de risque de maladie veineuse thromboembolique : une étude sénégalaise

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Abstract

Venous Thromboembolic Disease (VTE) is a public health concern due to diagnosis challenges, anticoagulant therapy and essential prevention for some high-risk cases. The aim of this study is to determine the prevalence of VTE, to identify its main risk factors and to describe the evolution of the disease.

Methodology: We conducted a descriptive and retrospective mono-centric study over seven years from January 2008 to December 2014 in the medical department of the Principal Hospital in Dakar, Senegal.

Results: Two hundred and sixteen (216) patients were enrolled. The hospital prevalence of VTE was 1.2%. The sex ratio M/F was 1.13. The average age of patients was 47 +/- 8.7 years (16-96 years) with the highest number of patients aged between 41 and 60. Nineteen patients (9%) developed a VTE during their hospitalization. The mostly spread risk factors were: advanced age (> 60), prolonged immobilization and recent surgery. Mortality was 6.4 %. Advanced age, stroke, respiratory infections, heart disease and cancer were the main causes of death.

Conclusion: VTE is a public health problem. Etiology should be sought carefully while introducing

anticoagulant therapy to reduce morbidity and mortality of this disease.

Keywords: pulmonary embolism, deep vein thrombosis, venous thromboembolism, risk factors, Senegal.

Résumé

La maladie thromboembolique veineuse est un problème de santé publique de par : son diagnostic parfois difficile, son traitement qui repose sur les anticoagulants et enfin sa prévention qui est indispensable dans certaines situations à risque.

Les objectifs de ce travail étaient de déterminer la prévalence de la MTEV, décrire les principales manifestations cliniques et paracliniques, identifier les principaux facteurs de risque et décrire les modalités évolutives.

Méthodologie : Nous avons effectué une étude descriptive, analytique, rétrospective monocentrique sur sept ans de janvier 2008 à décembre 2014 dans les services médicaux de l'Hôpital Principal de Dakar.

Résultats : Deux cent seize patients étaient inclus. La prévalence hospitalière de la MTEV était de 1,2 %. Le sex-ratio était de 1,13. L'âge moyen des patients était de 47 +/- 8,7 ans (16 - 96 ans) avec un pic entre 41 et 60 ans. Soixante-quinze patients (35%) avaient

plus de 60 ans. Le quart des patients avait moins de 40 ans. Dix-neuf (9%) patients avaient présenté une MTEV en cours d'hospitalisation.

Les facteurs de risque les plus retrouvés étaient : l'âge supérieur à 60 ans, l'immobilisation prolongée, la chirurgie récente. La mortalité était de 6,4 %. L'âge avancé, l'accident vasculaire cérébral, les infections respiratoires, les cardiopathies et le cancer étaient les causes de décès de nos patients.

Conclusion : La MVTE est un problème de santé publique. Une étiologie doit être recherchée minutieusement tout en instaurant le traitement anticoagulant afin de réduire la morbidité de cette affection

Mots-clés : Embolie pulmonaire, thrombose veineuse profonde, Maladie thromboembolique veineuse, facteurs de risque, Sénégal.

Introduction

Venous Thromboembolic Disease (VTE) includes deep vein thrombosis (DVT) and pulmonary embolism (PE). These two nosological entities have the same pathophysiological basis and the same risk factors [1]. VTE represents a major public health concern in Senegal, and its prevention remains high priority in the medical field [2]. There are a few studies about VTE (DVT and PE) in Senegal and Africa. However, most studies dealt with either DVT or PE alone. The objective of this study was therefore to describe the epidemiological, etiological and evolutive aspects of VTE, as observed in the medical departments of the Principal Hospital of Dakar, Senegal.

Methodology

We carried out a descriptive and retrospective monocentric study over a period of seven years from January 2008 to December 2014 at the Principal Hospital of Dakar. The patients included in this study were hospitalized and were diagnosed with DVT and / or PE. Survey forms were completed from patient

file data and served as basis of the analysis. We used SPSS software version 17.0 for data analysis. A value of $p < 0,05$ was considered significant.

Results

Two hundred and sixteen (216) patients were included, showing an average of 30 VTE cases per year. The prevalence of VTE was 1.2 %. There were 140 cases of isolated DVT (65%), 61 cases of isolated EP (28 %), and 15 patients (7%) with both DVT and PE. In 19 cases (9 %), there was a complication that appeared during hospitalization. The sex ratio was 1.11. The mean age of the patients was 47 +/- 8.7 years, with extreme ages of 16 and 96. The disease was more common in the 40 to 60 age group. Seventy-five patients (35%) were aged 60 and above. A quarter of patients (25%) was less than 40. Two patients (1%) were under 20 (Figure 1).

For 14% of the patients, no etiology was found. For 186 patients (86%), at least one risk factor of VTE was found. Most of the risk factors were linked to age over 60 years (35%), prolonged immobilisation / bed rest (29%), recent surgery (13%) and cancer (12%). (Table 1)

Cancer was a risk factor for 25 patients (12%). The mean age of these patients was 59 years \pm 17 years (range 33 and 84 years). Cancers of prostate, colon and pancreas were highly associated with VTE (Table 1).

We had eight cases of chronic inflammatory diseases: two cases of lupus erythematosus (1%), four cases of Behçet's disease (2%) and one case of Crohn's disease (0.45%). Thromboembolic disease occurred during the disease in five cases in a period of outbreak (in four patients with Behçet's disease and one in lupus). Thrombophilia was found in seven patients. The mean age of these patients was 42.8 \pm 6.5 years [16-68 years]. Only one case of thrombophilia was observed in a patient over 60 without a known thromboembolic antecedent. Two of the nine patients (22%) with bilateral DVT had thrombophilia.

The evolution with anticoagulant treatment was good

(Low Molecular Weight Heparin or Non-Fractionated Heparin) followed by an oral relay with Antivitamin K). Sixty-three patients had elastic compression (41% of the 155 patients with DVT). The outcome was favourable for 201 patients (93%). A haemorrhagic complication during hospitalization related to an antivitamin K overdose was observed in five patients, including two cases of mucocutaneous haemorrhage, one case of epistaxis, one case of haematuria and one case of haemorrhage with unspecified localisation. Mortality was 6.9% (15 patients). Cancer alone was responsible of 9 of 15 deaths. Mortality related to cancer was 36%.

Table I: Risk factors for VTE

Risk Factors		Number of patients	Percentage of patients (%)
Age > 60		75	35
Immobilization /bed rest		62	29
Recent surgery < 4months		28	13
Cancer	All cancer	25	12
	Prostate	6	3
	Colon	6	3
	Pancreas	5	2
	Lung	4	2
	Ovaries	2	1
	Liver	1	0,5
	Uterus	1	0,5
Oestrogen therapy		18	8
Abortion		16	7
Pregnancy / Postpartum		11	5
Severe inflammatory disease		8	3
Thrombophilia	All Thrombophilia	7	3
	Protein C deficiency	2	1
	Protein S deficiency	2	1
	Antithrombin III deficiency	1	0,5
	Lupus anticoagulant circulating	1	0,5
	Anti-cardiolipin antibody	1	0,5
Varicose veins of lower limbs		1	0,5
Nephrotic syndrome		1	0,5

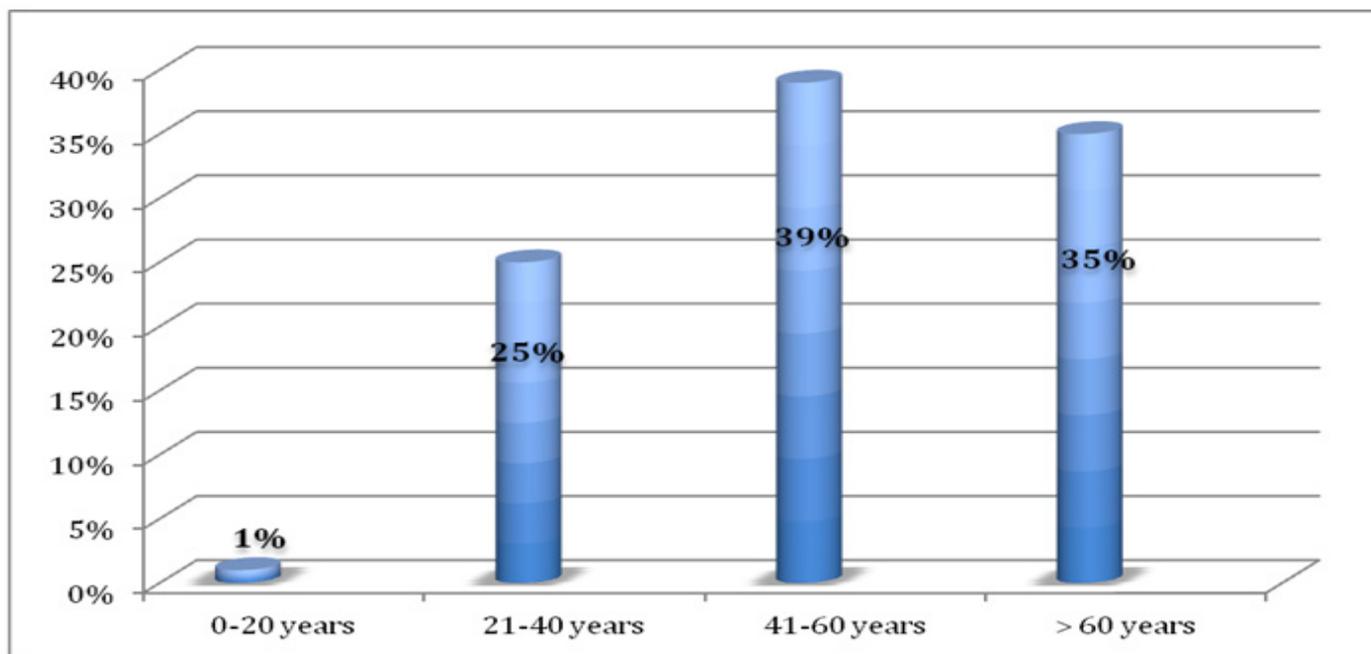


Figure 1: Distribution of Patients by Age Range

Discussion

Our study reports a prevalence of 1.2%. Formerly known as «clinical curiosity in black Africa», VTE is now more frequent, with a prevalence between 1.4 and 5% in sub-Saharan Africa [3,4]. This is probably explained through better knowledge of this pathology, progress in the imagery and especially availability and accessibility of means of exploration in our regions. The VTE was a complication occurring during hospitalization for 19 patients (9%). The overall incidence of secondary VTE occurring during hospitalization in medicine was estimated at 15% in the MEDENOX study [5]. A bed rest of more than 3 days is a risk factor for VTE. After one week of bed rest without prophylactic treatment, the frequency of DVT is estimated at 15% [6]. These cases of “hospital VTE” can be avoided by a good prevention using prophylactic heparin therapy and an early rise. Recommendations on the prevention of VTE in the medical environment have recently been updated [7]. Venous thromboembolism is associated with Virchow’s triad; three conditions that predispose to thrombus formation (stasis, hypercoagulability and endothelial damage) [5]. VTE is usually multifactorial, and all efforts should be undertaken to find a cause for each case. At least one risk factor was found in 86% of our patients. A similar outcome (86.1%) was found in the Maghreb study conducted by R. Ben Salah [8]. In the ENDORSE study (Senegal), a risk factor was found in 57% of cases [2]. Age is a significant risk factor for VTE. The incidence of VTE increases with age, and after 40, the risk doubles every 10 years. Several mechanisms are mentioned: limitation of physical mobility, increased blood stasis, comorbidity, increase in factor VIII and fibrinogen [8].

The average age of our patient population is 47.23, higher than the average age seen by other African authors (42-46) [3, 9]. On the other hand, in France, the average age of patients who were hospitalized in 2010 for VTE was higher at 67.6 [7]. This geographical difference between western countries and Africa could be explained by the fact that the

western population is older than ours. The prevalence of VTE is low in young subjects; One-quarter of our patients were under 40 and only 2 patients were under 20. An American study confirms the rarity of VTE in young subjects with a prevalence of PE of 12 per 100 000 patients of 15 to 44 versus 265 per 100 000 for those of more than 65 [10]. Exhaustive etiological research of constitutional or acquired thrombophilia is required for this age group. The age of onset of the first thrombotic episode is usually between 15 and 45 [11]. In our study, most of our patients with thrombophilia were under 40. In cases of bilateral venous thrombosis, thrombophilia was present twice in nine cases (22% of cases). Acquired thrombophilia was observed in two of our patients (1%).

In the elderly, a neoplastic cause should be systematically investigated. A VTE reveals a type of cancer in 10 to 20% of cases, particularly in the case of recurrence, localization of upper or bilateral limb, or occurring under AVK [12]. A bilateral character was noted in seven patients with cancer (36% of cases). This prevalence is slightly higher than prevalence reported by some authors (28%) [13]. It seems that a bilateral character of VTE must always point to thrombophilia or neoplasia. In 14% of our patients, no risk factors were found. Perhaps the systematic search for thrombophilia for any young patient under 40, as well as search for other etiologies such as Cockett’s Syndrome, would have reduced the number of idiopathic cases. However, due to the prohibitive cost of an exhaustive thrombophilia risk assessment in Senegal (at an average price of 300 \$), these tests are not always affordable for patients with limited earnings. Treatment in our study was mainly based on LMWH and / or HNF and Antivitamin K, with the target INR between 2 and 3. This classical attitude is consistent with the literature [14]. The use of elastic compression in our study (41%) was limited by the prohibitive cost of compression stockings (112 \$). Direct oral anticoagulants (DOACs) were not used for our patients because they were not available in our pharmacies. DOACs have the same efficacy as conventional treatment with antivitamin K and

are associated with a significantly high degree of safety in relation to hemorrhagic complications [15]. Evolution under treatment was good for 83% of patients. Mortality was 6% and particularly higher (36%) in patients with cancer. Our work confirms that the association of VTE and cancer is a factor of negative prognosis. Our study has some limitations. It is a retrospective study, thus including restrictions proper to studies of this type. Moreover, all our young patients didn't have an exhaustive thrombophilia risk assessment, which is another limitation of our work.

Conclusion

VTE is a reality in Senegal. It can occur at any age. Etiology is dominated by neoplasia in the elderly and thrombophilia in young subjects. The association of VTE and cancer is a factor of negative prognosis.

Contribution of authors

All the authors contributed to the conduct of this work. All authors also declare that they have read and approved the final version of the manuscript.

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Conflict of interest : None

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