



ISSN (P): 2521-3466
ISSN (E): 2521-3474
© Clinical Orthopaedics
www.orthoresearchjournal.com
2020; 4(2): 09-11
Received: 10-02-2020
Accepted: 14-03-2020

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Thromboembolic complications secondary to limb trauma in orthopedic surgery department of Sylvanus Olympio university hospital

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DOI: <https://doi.org/10.33545/orthor.2020.v4.i2a.217>

Abstract

Introduction: Thromboembolic complications arise when the Virchow triad is brought together. In trauma, trauma, bed rest and even treatment promote these complications.

The aim: To determine the epidemiological aspects of these complications in trauma patients of the limbs in order to improve prevention and management.

Material and method: It was a prospective study from January 1 to December 31, 2018 on the trauma of members admitted to the orthopedic trauma service and who presented a thromboembolic complication. The parameters studied were age, sex, weight, nature of the limb lesion, site of the lesion, type of thromboembolic complications, time to onset of the complication.

Results: Twelve (12) patients including 8 men and 4 women presented thromboembolic complications after their trauma. The average age of the patients was 35.4 years. Complications were observed after surgery in 5 cases and after orthopedic treatment in 3 cases. Deep vein thrombosis (DVT) was found in 9 cases and pulmonary embolism in 3 cases. The limb trauma consisted of a fracture in 10 patients and a dislocation of the knee in 2 cases. Complications mainly occurred on pelvic fracture with 4 cases. The delay of onset of these complications was the first 4 post-traumatic days in most of the patients.

Keywords: Thromboembolic complications, trauma, limbs, prevention

Introduction

Thromboembolic complications represented by pulmonary embolism and venous thrombosis of the limbs were sometimes considered rare or non-existent in African black subjects [1]. They are more and more found in our practice and are sometimes fatal when the diagnosis is made late thus constituting a real public health problem [1-3]. They occur after Virchow triad disorder formed by hypercoagulation, venous stasis and an intimal lesion. In traumatology, trauma, bed rest and sometimes orthopedic or surgical treatment contribute to these complications. The risk of these complications occurring in bone surgery is 50% in the lack of prophylaxis and 5 to 15% in case of prophylaxis [4]. The mortality rate varies from 2% to 3% for prosthetic surgeries and can reach 4% to 7% in pelvis and hip surgery [5]. Prevention remain an important step in care.

The Orthopedic Surgery Department of the Sylvanus Olympio Hospital Center is the referential department for bone surgery. Some patient hospitalise or externally followed present thromboembolic complications which are sometimes diagnosed late. Faced to theses complications whose number continues to increase, we decided to conduct this study to determine the epidemiological aspects of these complications in patients with traumatized limbs to improve prevention and management.

Material and Method

It was a prospective study from January 1 to December 31, 2018 Carried out in the traumatology and orthopedic department of the Sylvanus olympio hospital. It focused on the

trauma of members hospitalized in the department or externally followed with a thromboembolic complication such as deep vein thrombosis or pulmonary embolism. The diagnosis was made after a clinical suspicion confirmed by a paraclinical assessment. Patients who did not have paraclinical confirmation were not included in the study. The interrogation allowed to look for other favoring factors apart the traumatic context.

Thus, the history of inflammatory disease, thrombophilia and varicose veins of the limbs was sought.

The parameters studied were the age, sex, weight, the nature of the injury on the limb, the seat of the lesion, the type of thromboembolic complications, the taking or not of a prophylactic treatment, the delay of occurrence of the complication.

Results

During the study period, 1132 patients were admitted for limb trauma of which nearly $\frac{3}{4}$ was sitting in the lower limbs. Thirty-seven patients (37) had clinical manifestations of thromboembolic complications. Among them only twelve (12) patients had performed the paraclinical assessment to confirm the diagnosis. Our study included twelve patients including 8 men and 4 women. The average age was 35.4 years with the extremes of 18 and 58 years old. No patient had an antecedent of inflammatory disease or thrombophilia. Two patients had varicose veins before the apparition of the complication. Three patients had a higher BMI (obesity). Complications occurred during hospitalization in 5 patients. The remaining seven patients were followed externally. Complications were observed after surgery in 8 cases and after orthopedic treatment in 4 cases. Deep vein thrombosis (DVT) was found in 9 patients and pulmonary embolism in 3 patients. The main paraclinical confirmatory examinations were thoracic CT angiography, pelvic limbs doppler and the D-dimer assay. Member trauma consisted in a fracture in 10 patients and dislocation of the knee in 2 cases. The fracture was mainly found on the pelvis in 5 cases, on femur in 3 cases and in 2 cases on the tibia. All patients received anticoagulant prophylactic therapy with enoxaparin. Five of seven patients who were external followed stopped their anticoagulant prophylaxis before the complication occurred. The average delay of complications was 3.2 days post-injury. They occurred during the first 4 post-traumatic days in 6 patients, between the fourth and the tenth day in 4 patients, and on two patients after tenth days. The management of these patients was done with the services of resuscitation and cardiology. None of these complications was fatal.

Discussion

The aim of This study was to identify the epidemiological profile of thromboembolic complications in traumatized limbs. This study has many biases related to the short duration and low sample making a statistical study difficult. A comparison with the data from the literature will nonetheless allow us to draw conclusions in order to improve our management of these complications. The frequency of occurrence of thromboembolic complications varied. Jumel et al. [6] estimated from 0.5 to 1% these complications in his study. We have 1% of complications in our study. This frequency is close to the values of the literature, but it was below the real values because we did not integrate patients who had not paraclinical confirmations in our study. In contrast to the work of Takeshi et al. [7], who found an average age of 75 years old, we found an average age of 35.4 years which approaching the value of oyono et al. [8]. This disparity could be explained by the fact that in our contexts,

traffic accidents, especially young, very active subjects. Male dominance is also related to the context of the occurrence of injuries that affect males more than females [9]. Obesity is described as a promoting factor in thrombo-venous occurrence [10]. Only three patients had a BMI greater than 30. The weakness of our sample did not allow us to draw a correlation in the context of limb trauma. We found 9 cases of deep vein thrombosis and three cases of pulmonary embolism. Traumatized patients are at high risk of thromboembolic complications as Niikura et al. [11] found 19% in their Japanese series in 2017. The most common complication is deep vein thrombosis. Pulmonary embolisms are less frequent but often fatal. Flevas et al estimates the fatal pulmonary embolism rate to be 5 to 10% and this rate is particularly high in traumatic lesions of hip [12]. The delay usually occurs between the fourth and tenth post-traumatic days. Tetsuya Yumoto et al. [13] found an average delay of 10 days in her traumatized patients. We found a shorter delay due to the delay in the management of fractures and the nonobservance of patients to prophylaxis. Doppler ultrasonography, thoracic CT angiography and D-dimer help to confirmation of diagnostic. Although Doppler is considered to be the gold standard [14] in several studies, CT angiography has the advantage of refining the diagnosis of embolisms and thromboses. Niikura et al. [11] suggests that in the absence of Doppler ultrasound and CT angiography, D-dimmers may be helpful in diagnosis, especially when values approach 15.2 lg / mL after the seventh post-traumatic day.

Prophylaxis occupies an important place in the care. Several means are evaluated and are grouped into mechanical and medicinal means. The principle of physical methods is used instead of the venous pump and calf pump function and vegetable voice to accelerate blood flow in the lower limbs [15]. They allowed to reduce the TVP environment by 68% [16]. This prophylaxis is inexpensive and accessible but difficult to apply in fractured patients. Heparin prophylaxis of low molecular weight showed superiority over unfractionated heparin and anti-vitamin K, especially in the traumatic context. The efficacy dosage is the dose of 5000 IU in two daily administrations [17]. The main difficulty of the drug prophylaxis in our patients is represented by the cost of these molecules which explain the non-observance of the treatment instituted. Oral anticoagulants have appeared on the market but the cost is still inaccessible for our populations. We are proceeding with an early lifting of patients and allow walking on the limb as quickly as possible. The mechanical means are proposed in combination with the antithrombotic treatments to have the best results for the patients.

Conclusion

Thromboembolic complications are more and more common in traumatology. Apart the traumatic context, the other contributing factors are represented by the delay of management and the non-observance of the prophylactic treatment. The combination of mechanical prophylaxis with anticoagulants significantly reduces the risk of occurrence of these complications. Early lifting and early walking on the limb are very effective and inexpensive way to reduce and avoid these complications.

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