

Prevalence of Risk Factors of Thromboembolic Complications in Women after Major Joint Arthroplasty in the Republic of Sakha (Yakutia)

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Abstract

The aim of this study was to assess the risk factors for thromboembolic complications after total arthroplasty of large joints in women in Yakutia conditions to optimize the management tactics of this category of patients. The average age of women was 59.98 ± 11.56 years in the age range from 50 to 70 years. In order to validate the study, women were divided into 2 groups. The main group consisted of 284 women undergoing total knee arthroplasty (Group 1). The comparison group included 147 women undergoing total hip arthroplasty (Group 2). The study demonstrated that hypertension was more common in patients of Group 1 than in patients of Group 2. However, the incidence of coronary heart disease and heart rhythm disorder was detected most frequently in patients with total hip arthroplasty. Obesity, thrombosis of the veins of the lower extremities, and liver disease were detected with almost the same frequency in women with total knee arthroplasty and those with total hip arthroplasty. The frequency of occurrence of complications depending on the risk factors for thromboembolic complications and the type of surgical treatment of the joint was equal in the two groups of studied patients. (**International Journal of Biomedicine. 2018;8(4):333-336.**)

Key Words: thromboembolic complications • women • total arthroplasty • large joints

Introduction

A significant prevalence of degenerative-dystrophic diseases of the joints of the lower extremities leads to a further search for effective methods of treatment.⁽¹⁻³⁾ Among the latter, arthroplasty of the joints occupies a rather significant place, which allows eliminating pain syndrome and restoring range of motion and supporting ability of the lower limb.^(4,5) The risk of venous thromboembolic complications is maximal precisely in orthopedic practice, especially in endoprosthetic replacement of large joints. According to the summary statistics by W. Geertsetal (2004), after endoprosthetics of large joints in the absence of thromboembolic complications prevention, the incidence of deep vein thrombosis in the lower extremities

reaches 40% to 80% and pulmonary embolism, 4% to 10%. The frequency of symptomatic thromboembolic complications in hip joint arthroplasty on the background of thromboprophylaxis is, according to various sources, from 1.3% to 3.4%, and in case of knee arthroplasty, from 1.7% to 2.8%.⁽⁶⁾ Interestingly, fatal pulmonary embolism has remained consistent in primary total hip arthroplasty and total knee arthroplasty, between 0.1 and 2%, no matter which agents are used.^(7,8) According to Pedersen et al.⁽⁹⁾, a high level of comorbidity and general anaesthesia were strong risk factors for both venous thromboembolism and bleeding, with no difference between patients undergoing total hip and knee replacement. The assessment of the level of influence of various risk factors on the development of venous thromboembolic complications for many decades has been the subject of discussion in the medical literature, since an adequate prevention of venous thromboembolic complications is interconnected with the assessment of risk factors.^(4,6,10) Considering the above-mentioned, the goal of our study was to

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assess the risk factors for thromboembolic complications after total arthroplasty of large joints in women in Yakutia conditions to optimize the management tactics of this category of patients.

Materials and Methods

This work is based on the results of a prospective clinical study of female patients who underwent knee and hip joint arthroplasty between 01.01.2012 and 12.31.2014. The average age of women treated in the trauma and orthopedic department was 59.98±11.56 years in the age range from 50 to 70 years. Large joint arthroplasty was performed in 592 female patients (Fig.1)

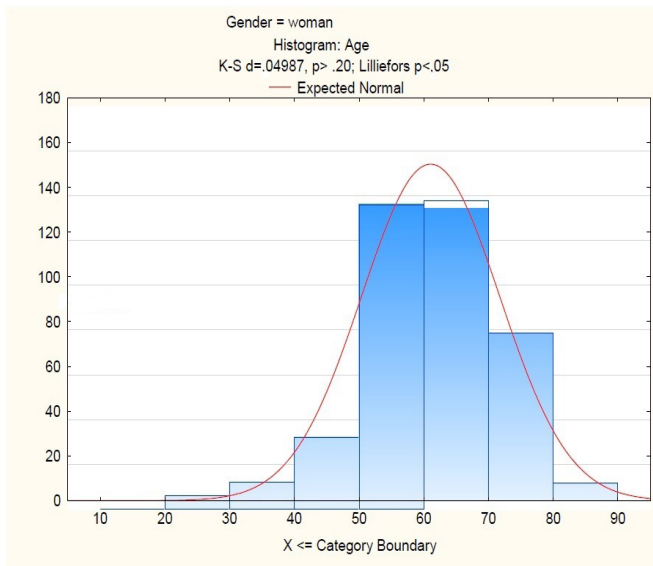


Fig.1. The incidence of large joint arthroplasty depending on age

Inclusion criteria: surgical treatment (total arthroplasty of the knee and hip joints) of degenerative-dystrophic diseases of the joint, false joint of the femur neck, systemic diseases, endoprosthesis instability, and written informed consent.

Exclusion criteria: lack of capacity to give informed consent; patient refusal.

The study was approved by the local Ethics Committee of M. K. Ammosov North-Eastern Federal University.

Patients eligible for all criteria included 431 people. In order to validate the study, women were divided into 2 groups. The main group consisted of 284 women undergoing total knee arthroplasty (Group 1). The comparison group included 147 women undergoing total hip arthroplasty (Group 2).

After the onset of hemostasis, all patients were prescribed prophylactic doses of anticoagulants in accordance with the clinical guidelines for the prevention of thromboembolic complications of the national standard of the Russian Federation. At discharge from the hospital, all patients were given recommendations for further prevention of thromboembolic complications; the goals of these drugs and possible complications were re-explained. It is also

recommended to control the indicator of international normalised ratio to patients who took an indirect anticoagulant. Evaluation of the effectiveness of prophylactic treatment regimens for thromboembolic complications was carried out at the end of the course of prophylaxis and 12 months after surgical treatment.

Statistical analysis was performed using statistical software package SPSS version 19.0 (SPSS Inc, Chicago, IL). The normality of distribution of continuous variables was tested by one-sample Kolmogorov-Smirnov test. Quantitative parameters were presented as Median (Me) and 25th and 75th percentiles as Inter Quartile Range (IQR). Mann-Whitney U test was used to compare means of 2 groups of variables not normally distributed. The frequencies of categorical variables were compared using Pearson χ^2 or Fisher's exact test, when appropriate. A value of $P < 0.05$ was considered significant.

Results and Discussion

Many studies in the literature describe a number of risk factors that act as factors for the development of venous thromboembolic complications. These include coronary heart disease, arterial hypertension, chronic circulatory failure, varicose veins of the lower extremities, obesity, and a history of thrombosis.⁽¹¹⁻²²⁾ In systematic review performed by Zhang et al.⁽²³⁾, older age, female gender, higher body mass index and bilateral surgery were found to be venous thromboembolism risk factors for both total hip arthroplasty and total knee arthroplasty. Considering the above-mentioned, we carried out an analysis of these concomitant diseases in order to determine their significant effect on venous thromboembolic complications in the studied patients.

Analysis of the clinical characteristics revealed that in all patients the most frequently associated diseases were obesity, arterial hypertension, and coronary heart disease (Table 1).

Table 1.

The frequency of concomitant diseases, depending on the type of joint replacement

Concomitant pathology	Group 1 (n=284)	Group 2 (n=147)	P ₁₋₂
Obesity	110 (38.7%)	68 (46.2%)	0.132
Varicose veins of the lower extremities	79 (27.8%)	39 (26.5%)	0.776
Hypertension	194 (68.3%)	82 (55.8%)	0.010
Coronary heart disease	75 (26.4%)	55 (37.4%)	0.018
Thrombosis of the veins of the lower extremities in history	2 (0.7%)	4 (2.7%)	0.090
Heart rhythm disorder	1 (0.35%)	8 (5.4%)	0.000
Hepatitis C. liver failure	7 (2.46%)	4 (2.7%)	0.872

Hypertension was more common among women in Group 1 (68.3%) than among those in Group 2 (55.8%). However, the incidence of coronary heart disease and heart rhythm disorder was detected most frequently in Group 2. Thrombosis of the veins of the lower extremities and liver disease were detected with almost the same frequency in women with knee prosthesis and those with hip prosthesis.

As can be seen from Table 2, the frequency of occurrence of complications depending on the risk factors for venous thromboembolic complications and the type of surgical treatment of the joint was equal in the two groups of studied patients.

Table 2.

The frequency of complications depending on risk factors for thromboembolic complications and the type of joint replacement

Risk Factor	Complication* (n=14)		No complication (n=417)	
	Group 1	Group 2	Group 1	Group 2
Obesity	3	-	107	68
Varicose veins	3	2	76	37
Hypertension	3	2	147	80
Coronary heart disease	1	1	74	54
Thrombosis of the veins of the lower extremities in history	-	1	2	3
Heart rhythm disorder	1	-	6	8

*- no statistically significant differences between Group 1 and Group 2

In conclusion:

The study demonstrated that hypertension was more common in patients with total knee arthroplasty than in patients with total hip arthroplasty. However, the incidence of coronary heart disease and heart rhythm disorder was detected most frequently in patients with total hip arthroplasty. Obesity, thrombosis of the veins of the lower extremities, and liver disease were detected with almost the same frequency in women with knee prosthesis and those with hip prosthesis. The frequency of occurrence of complications depending on the risk factors for venous thromboembolic complications and the type of surgical treatment of the joint was equal in the two groups of studied patients.

Conflict of interest

The authors declare that they have no competing interests.

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