ORIGINAL RESEARCH

Assessment of hematological complications after orthopaedic surgery

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Received: 22 May, 2023 Accepted: 27 July, 2023

ABSTRACT

Background: Orthopedic surgeons treat fractures, dislocations, and other traumatic injuries resulting from accidents, falls, and sports-related incidents. The present study was conducted to assess various hematological complications after orthopaedic surgery.

Materials & Methods: 158 patients undergoing hip or knee arthroplasty of both genderswho were prescribed with 5000 units of heparin once daily for a period of 10 days were included.All cases were treated by single orthopaedic surgeon. Parameters such as operative type, duration of procedure and complications etc. were recorded

Results: Out of 158 patients, males were 88 and females were 70. Type of surgery was primary total knee arthroplasty in 50, primary total hip arthroplasty in 48, hip resurfacing in 24 and uni-compartmental knee arthroplasty in 36 cases. The difference was significant (P< 0.05). Out of 158 cases, thromboembolic complications were noted in 4 (2.5%) cases.

Conclusion: After arthroplasty of the knee or hip, heparin is required. Heparin has certain benefits, but it should be used with caution and thorough preoperative and postoperative platelet count monitoring. 2.5% of the participants in our study experienced heparin-induced thrombocytopenia.

Key words: thromboembolic complications, heparin, complications

INTRODUCTION

Orthopedic surgery, also known as orthopedics, is a medical specialty that focuses on the diagnosis, treatment, and prevention of disorders and injuries related to the musculoskeletal system. The musculoskeletal system includes bones, joints, ligaments, tendons, muscles, and nerves that provide structure, support, and movement to the body.[1] Orthopedic surgeons treat fractures, dislocations, and other traumatic injuries resulting from accidents, falls, and sports-related incidents.[2]Joint replacement involves replacing damaged or arthritic joints, such as the hip, knee, shoulder, and ankle, with artificial implants to relieve pain and improve joint function. Orthopedic surgeons address spinal conditions such as herniated discs, spinal stenosis, and deformities like scoliosis through surgical procedures.[3] The NICE society advises giving chemical thromboprophylaxis to patients who have undergone hip and knee replacement surgery. Low molecular weight heparin is used for this reason, however it has an inherent and substantial risk of heparin-induced thrombocytopenia (HIT).In addition to thromboembolic consequences such deep vein thrombosis (DVT), embolism, embolic ischemia of limb, cerebrovascular accident, and myocardial infarction, ulcerating skin lesions at the injection site are the characteristic presenting signs of heparin-induced thrombocytopenia.[4] Even though postoperative thrombocytopenia's exact prevalence has not been quantified in the literature, it is a common hematologic side effect following surgery.[5]The present study was conducted to assess various hematologicalcomplications after orthopaedic surgery.

MATERIALS & METHODS

The present study consisted of 158 patients undergoing hip or knee arthroplasty of both genders. All gave their written consent to participate in the study. Data such as name, age, gender etc. was recorded. Patients who were prescribed with 5000 units of heparin once daily for a period of 10 days were included.All cases were treated by single orthopaedic surgeon. Parameters such as operative type, duration of procedure and complications etc. were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table: I Distribution of patients

Total- 158		
Gender	**Male**	**Female**
Number	88	70

Table I shows that out of 158 patients, males were 88 and females were70.

Table II Type of surgery performed

Surgery	Number	P value
Primary total knee arthroplasty	50	0.05
Primary total hip arthroplasty	48	
Hip resurfacing	24	
Uni-compartmental knee arthroplasty	36	

Table: II, graph I shows that type of surgery was primary total knee arthroplasty in 50, primary total hip arthroplasty in 48, hip resurfacing in 24 and uni-compartmental knee arthroplasty in 36 cases. The difference was significant (P< 0.05).

Graph I Type of surgery performed

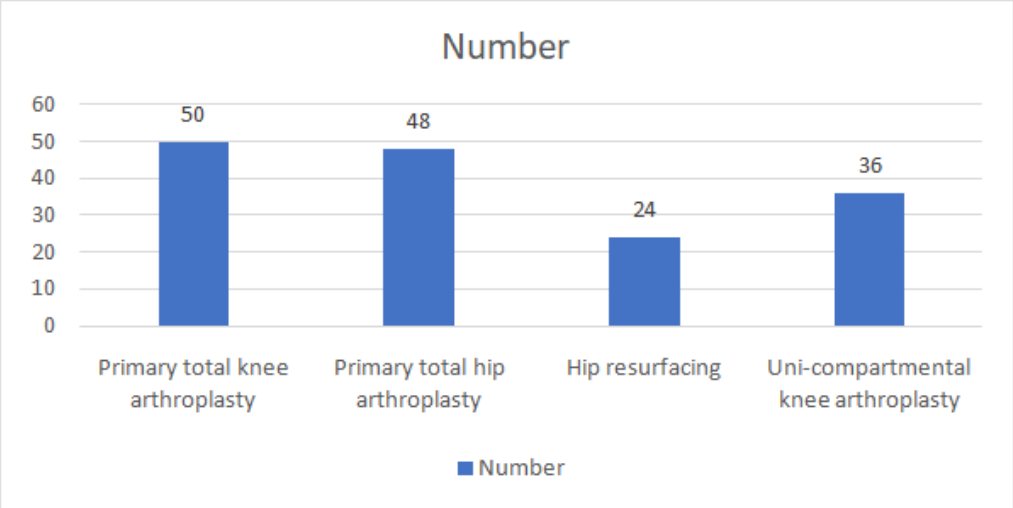

Table: III Thromboe mbolic complications

Total cases	Thromboembolic complications	Percentage
158	4	2.5%

Table: III shows that out of 158 cases, thromboembolic complications were noted in 4 (2.5%) cases.

DISCUSSION

Heparin-induced thrombocytopenia (HIT) is a rare but serious immune-mediated complication that can occur in response to heparin, a commonly used blood-thinning medication.[6] HIT is characterized by a significant decrease in the number of platelets in the blood (thrombocytopenia) and an increased risk of abnormal blood clot formation (thrombosis).[7]HIT occurs when the immune system recognizes complexes formed between heparin molecules and a protein called platelet factor 4 (PF4) as foreign substances. This recognition triggers an immune response that leads to the production of antibodies against these complexes.[8] The antibodies can activate platelets and promote the formation of blood clots, which can cause various complications.[9,10]The present study was conducted to assess various hematological complications after orthopaedic surgery. We found that out of 158 patients, males were 88 and females were 70. In a study by Sanjoy et al[11]a total of 2700 patients were operated for total hip arthroplasty, compartmental knee arthroplasty or primary knee arthroplasty, all these patients were discharged with daily dosage of 5000 units of subcutaneous heparin. Out of these only 1500 responded after a 6-week follow-up period. There were 2.4% (n=36) who developed thromboembolic complications. There were 51% (n=1377) cases of primary total knee arthroplasty. In 42% cases (n=1134) primary total hip arthroplasty was done. In 5% cases (n=135) uni compartmental knee arthroplasty was done. We found that type of surgery was primary total knee arthroplasty in 50, primary total hip arthroplasty in 48, hip resurfacing in 24 and uni-compartmental knee arthroplasty in 36 cases. Out of 158 cases, thromboembolic complications were noted in 4 (2.5%) cases.Warkentin et al[12]evaluated the occurrence of thrombocytopenia amongst 439 patients

who received low molecular weight heparin after hip arthroplasty and fou d the incidence to be 0.9%, and 3.2% of patients in his study developed anti–PF4/ heparin antibodies. Mohan et al[13] included study of patients with haemophilia types A or B who underwent a TKA over a 12-year period. These patients were compared to both a non-haemophiliac control group. Twenty-one TKA procedures in 18 patients (72% haemophilia A, 28% haemophilia B) were suitable for inclusion with a mean age of 44 years. The mean haemoglobin drops at 24 and 48 h postoperatively were 2.7 g/dl and 3.8 g/dl respectively. There was no significant difference in haemoglobin drop at 48 h postoperatively when compared to the non-hemophiliac control group (P = 0.2644). There were no immediate perioperative complications and two patients (9.6%) required postoperative transfusion. Diagnosing HIT involves a combination of clinical evaluation, laboratory tests, and exclusion of other potential causes of thrombocytopenia. A significant decrease in platelet count is a hallmark of HIT.Tests that assess the activation of platelets by HIT antibodies, such as the serotonin release assay (SRA) and the heparin-induced platelet activation (HIPA) assay.Enzyme-linked immunosorbent assay (ELISA) can detect the presence of HIT antibodies.[14] The limitation of the study is small sample size.

CONCLUSION

Authors found that after arthroplasty of the knee or hip, heparin is required. Heparin has certain benefits, but it should be used with caution and thorough preoperative and postoperative platelet count monitoring. 2.5% of the participants in our study experienced heparin-induced thrombocytopenia.

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