

ORIGINAL RESEARCH

Prospective clinical trial for decoding the prevalence and intensity of hematologic complications in postoperative orthopaedic patients

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ABSTRACT

Background: Hematologic problems are frequently found postoperatively after orthopaedic operations worldwide. **Aim:** The current retrospective clinical study's objective was to evaluate the numerous hematologic complications that patients experienced after orthopaedic surgery. **Materials and Methods:** Transfusion information was evaluated in the medical records of 78 patients who had orthopaedic surgery. The results were developed via statistical analysis of the collected data. **Results:** Following surgery, 6.41% (n=5) research participants required blood transfusions, 24.35% (n=19) study participants experienced significant bleeding, and 2.56% (n=2) study participants experienced cardiac necrosis. Coded strokes were seen in 3.84% (n=3) study participants. The 1.28% (n=1) patient experienced further mild problems. 37.17% (n=29) of the research individuals had all problems mentioned. **Conclusion:** According to the results of the current investigation, orthopaedic surgery patients frequently have hematologic problems. To get to a firm conclusion, additional research in the future is necessary.

Keywords: Complications, Hematological parameters, Orthopaedic surgery, Surgical site evaluation

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INTRODUCTION

According to WHO (World Health Organization), routine and frequent usage of a checklist for surgical safety is essential and required before every surgical treatment. According to estimates from earlier literature, there are an estimated 235 million procedures performed worldwide each year.¹ In order to enhance the safety of the patient having surgery, a system must be put in place and maintained. According to various clinical data, following a surgical safety checklist can help prevent over 50% of postoperative problems.²

OTS (orthopaedic and trauma surgery) can result in severe blood loss and acute postoperative anaemia, which frequently calls for allogeneic blood transfusions (ABT). The clinical, financial, and logistical drawbacks of ABT have prompted the

creation of multidisciplinary, multimodal patient blood management (PBM) programs, whose goal is to lessen or do away with the need for ABT and enhance therapeutic results.³

The bulk of difficulties are not technological in nature, but rather result from poor situational awareness, decision-making, communication, leadership, and collaborative abilities. In light of these considerations, WHO had developed a number of guidelines to guarantee surgical safety in patients having surgery all over the world.⁴

Following are evidence-based recommendations for blood transfusion in perioperative and postpartum situations from the American Society of Anesthesiologists:^{5,6}

1. When the haemoglobin concentration is less than 6 g/dl and usually always when it is less than 10

g/dl, especially when anaemia is severe, transfusion is almost always necessary.

2. The patient's risk for consequences from insufficient oxygenation should be taken into consideration when determining whether intermediate haemoglobin concentrations (6–10 g/dl) warrant or necessitate RBC transfusion.
3. Methods that ignore the significant physiological and surgical aspects impacting oxygenation, such as using a single haemoglobin trigger for all patients, are not advised.
4. Due to the lesser (albeit still considerable) hazards associated with autologous RBC transfusion compared to allogenic RBC transfusion, the indications may be more flexible.
5. When necessary, preoperative autologous blood donation, intraoperative and postoperative blood recovery, acute normovolemic hemodilution, and methods to reduce blood loss (intentional hypotension, pharmacological drugs, etc.) may be helpful.⁶

Following orthopaedic surgery, postoperative problems linked to hematologic parameters are often found internationally. Post-surgical death rates are 2-3 times higher after infection.⁴ Organ space infection and incisional infections are connected to the infection of surgical wounds at the surgical site in the wound that was closed under clean conditions.⁷

Therefore, the goal of the current study was to evaluate the numerous postoperative hematologic complications that the individuals experienced after having orthopaedic surgery.

MATERIALS & METHODS

The objective of the current prospective clinical investigation was to evaluate the different postoperative hematologic problems experienced by the individuals after orthopaedic surgery. The study was carried out with approval from the relevant Ethical committee. Total 78 participants from both genders, the research participants receiving orthopaedic surgery at the institution and participants agreeing to engage in the study were the inclusion criteria for the study. Subjects who refused to volunteer to participate in the trial, those with

systemic disorders, women who were pregnant, and those receiving steroid medication were all excluded. All subjects gave their informed permission after being fully told about the study's design.

Following the individuals' ultimate participation in the research, each subject's complete history was transcribed along with a general examination. In order to examine the specifics of blood transfusion, medical records for each of the included participants were retrospectively reviewed by evaluating the records combined with data from the blood bank. Records from the year following surgery were evaluated.

Using SPSS software version 21 (Chicago, IL, USA) and one-way ANOVA and t-test for results formulation, the gathered data were statistically evaluated. The information was presented as percentages, numbers, means, and standard deviations. The significance threshold was held at 0.05.

RESULTS

The goal of the current retrospective clinical investigation was to evaluate the different postoperative hematologic complications that the individuals experienced after having orthopaedic surgery. Medical data for 78 patients who underwent orthopaedic surgery were examined, including information on transfusions. In the current study, there were 31 females and 47 men. In the Department of Orthopaedics, 71 elective procedures and 7 emergency surgeries were performed. The spine surgery was the most often done procedure, followed by hip and knee operations.

Table 1 includes a list of the research participants' demographic details. The study's participants ranged in age from 14 to 72, with a mean age of 57.6 5.66 years. In the current study, there were 60.25% (n=47) men and 39.74% (n=31) females.

Hip surgery was performed in 28.20% (n=22) of the study patients, knee surgery in 29.48% (n=23), and spine surgery in 42.30% (n=33) of the study participants. 8.97% (n=7) of the individuals underwent emergency orthopaedic surgery, whereas 91.02% (n=71) underwent elective surgical treatments (Table 1).

Table 1: Demographic and disease characteristics of the study subjects

S. No	Characteristics	Percentage (%)	Number (n)
1.	Mean age (years)	57.6±5.66	
2.	Age range	14-72	
3.	Gender		
a)	Females	39.74	31
b)	Males	60.25	47
4.	Orthopaedic surgery type		
a)	Hip	28.20	22
b)	Knee	29.48	23
c)	Spine	42.30	33
5.	Orthopaedic procedure type		
6.	Emergency	8.97	7
7.	Elective	91.02	71

The results of the current study's assessment of the postoperative hematologic complications in the study subjects after orthopaedic surgeries revealed that coded strokes were observed in 3.84% (n=3) subjects, blood transfusions were performed after surgery in 6.41% (n=5) study subjects, major bleeding after orthopaedic surgeries was observed in 24.35% (n=19)

subjects, and myocardial necrosis was observed in 2.56% (n=2) study subjects. In the 1.28% (n=1) case, there were some other small difficulties. Total complications reported in study subjects were in 37.17% (n=29) of study subjects as depicted in Table 2.

Table 2: Postoperative complications seen in orthopaedic subjects following surgery

S. No	Complications	Percentage (%)	Number (n)
1.	Coded strokes	3.84	3
2.	Transfusion	6.41	5
3.	Major bleeding	24.35	19
4.	Myocardial Necrosis	2.56	2
5.	Others	1.28	1
6.	Total	37.17	29

DISCUSSION

The goal of the current retrospective clinical investigation was to evaluate the different postoperative hematologic complications that the individuals experienced after having orthopaedic surgery. Medical data for 78 patients who underwent orthopaedic surgery were examined, including information on transfusions. In the current study, there were 31 females and 47 men. In the Department of Orthopaedics, 71 elective procedures and 7 emergency surgeries were performed. The spine surgery was the most often done procedure, followed by hip and knee operations. These findings were in line with studies conducted by Kable AK et al⁸ in 2002 and Catchpole K et al⁹ in 2008, where authors reported findings that were comparable to those of the current investigation.

When the research respondents' demographics were examined, it was discovered that their ages ranged from 14 to 72 years, with a mean age of 57.6 5.66 years. In the current study, there were 60.25% (n=47) men and 39.74% (n=31) females. Hip surgery was performed in 28.20% (n=22) of the study patients, knee surgery in 29.48% (n=23), and spine surgery in 42.30% (n=33) of the study participants. 8.97% (n=7) of the individuals underwent emergency orthopaedic surgery, whereas 91.02% (n=71) underwent elective surgical operations. These findings were consistent with research conducted by Lingard L. et al¹⁰ in 2008 and Mathur P. et al¹¹ in 2013 on patients with comparable illness features.

The current study's findings regarding the evaluation of postoperative hematologic complications in the study subjects after orthopaedic surgeries revealed that coded strokes were observed in 3.84% (n=3) subjects, blood transfusions were performed after surgery in 6.41% (n=5) study subjects, major bleeding after orthopaedic surgeries was observed in 24.35% (n=19) subjects, and myocardial necrosis was observed in 2.56% (n=2) study subjects. In the 1.28% (n=1) case, there were some other small difficulties. The total number of problems reported by research participants was 37.17% (n=29). These outcomes were comparable to those of the trials conducted by

Oberweis BS et al¹² in 2015 and Smilowitz NR et al¹³ in 2016, when the authors reported comparable problems.

CONCLUSION

OTS (orthopaedic and trauma surgery) can result in severe blood loss and acute postoperative anaemia, which frequently calls for allogeneic blood transfusions (ABT). The clinical, financial, and logistical drawbacks of ABT have prompted the creation of multidisciplinary, multimodal patient blood management (PBM) programs, whose goal is to lessen or do away with the need for ABT and enhance therapeutic results.

Within its constraints, the current study draws the conclusion that orthopaedic surgery patients have a considerable rate of hematologic problems. The present study did, however, have certain drawbacks, including a limited sample size, a cross-sectional design, and geographic region biases. A firm conclusion will thus be reached with the aid of more longitudinal studies that have bigger sample sizes and longer monitoring periods.

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