

A Hospital Based Prospective Study to Assess the Haematological Complications Among Patients Undergone Various Orthopaedic Surgery

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Abstract

Background: Hematological post-operative complications in orthopedic surgery are commonly encountered phenomena across the world. Hence, we planned the present study to assess various post-operative hematological complications occurring in patients undergoing orthopedic surgery. **Materials & Methods:** This is a prospective study was conducted on 80 patients who underwent orthopedic surgery in the department of orthopedic surgery of the Government Medical College, Pali, Rajasthan during one year period. We performed a medical record review of all blood bank data and obtained number and date of transfusions. All the postoperative data were separately recorded and analyzed in excel sheet. SPSS software version 17.0 was used for evaluation of results. Chi-square test was used for assessment of level of significance. **Results:** A total of 80 subjects were included in the present study. The mean age of the subjects was 57.4 years. Out of 80, 48 were males and 32 were females. In 72 subjects, the type of orthopedic procedure was elective, while in remaining 8, the procedure was emergency type. Spine surgery was the most commonly done surgical procedure in our study population, followed by knee and hip surgery. In total of 30 patients, post-operative hematological complications were seen. Out of these complications, transfusion occurred in 20 patients. Major bleeding occurred in 5 patients. **Conclusion:** We concluded that hematological complications do occur in significant proportion of subjects undergoing various types of orthopedic surgeries. However, future studies with larger study group are recommended for assessing the correlation of hematological complications and prognosis of patients.

Keywords: Hematological, Orthopedic surgery, Surgical site checklist (SSC), Complications.

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Introduction

The World Health Organisation (WHO) recommends routine use of a surgical safety checklist prior to all surgical operations. With an estimated 234 million surgical operations performed each year around the world, a system to implement and maintain practices designed to improve patient safety is a necessity [1,2]. Two retrospective reviews have suggested that at least 50% of all surgical adverse events are preventable [3,4]. The majority of these are not caused by technical problems but a failure of teamwork skills, leadership, communication, decision-making and situational awareness [5,6]. This prompted the World Health Organisation (WHO) to identify multiple recommended practices to ensure the safety of surgical patients worldwide [7].

Hematological post-operative complications in orthopedic surgery are commonly encountered phenomena across the world. The mortality rate increases 2–3 times after infection. Surgical site infection in clean wounds (closed uninfected wounds) includes incisional and organ space infections. The mortality rate increases 2–3 times after infection [8–10]. Hence; we planned the present study to assess various post-operative hematological complications occurring in patients undergoing orthopedic surgery.

Materials & Methods

This is a prospective study was conducted on 80 patients who underwent orthopedic surgery in the department of orthopedic surgery of the Government Medical College, Pali, Rajasthan during one year period.

Inclusion Criteria

- All patients undergone orthopedic surgery
- All age groups.

Exclusion Criteria

- Patients unwilling for given consent
- Pregnant women
- Any systemic disease
- Patients on corticosteroid therapy

Methods

Data for the present study was obtained from the hospital administrative database. Complete demographic and clinical details of all the subjects were collected. We performed a medical record review of all blood bank data and obtained number and date of transfusions. Troponin level was collected from laboratory data. Complete follow-up records of all the patients was done till one years' time. All the postoperative data were separately recorded and analyzed in excel sheet. SPSS software version 17.0 was used for evaluation of results. Chi-square test was used for assessment of level of significance.

Results

A total of 80 subjects were included in the present study. The mean age of the subjects was 57.4 years. Out of 80, 48 were males and 32 were females (table 1). In 72 subjects, the type of orthopedic procedure was elective, while in remaining 8, the procedure was emergency type. Spine surgery was the most commonly done surgical procedure in our study population, followed by knee and hip surgery. In total of 30 patients, post-operative hematological complications were seen (Table 2). Out of these complications, transfusion occurred in 20 patients. Major bleeding occurred in 5 patients.

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Table 1: Demographic profile of patients

| Demographic profile | No. of patients (N=80) | Percentage |
|-------------------------------------|------------------------|------------|
| Age (yrs) (Mean±Sd) | 57.4±5.68 | |
| Sex | | |
| Male | 48 | 60% |
| Female | 32 | 40% |
| Type of orthopedic procedure | | |
| Elective | 72 | 90% |
| Emergency | 8 | 10% |
| Type of orthopedic surgery | | |
| Spine surgery | 34 | 42.5% |
| Knee surgery | 24 | 30% |
| Hip surgery | 22 | 27.5% |

Table 2: Post operative hematological complications

| Hematological complications | No. of patients (N=30) | Percentage |
|-----------------------------|------------------------|--------------|
| Myocardial necrosis | 3 | 3.75% |
| Major bleeding | 5 | 6.25% |
| Any transfusion | 20 | 25% |
| Coded stroke | 1 | 1.25% |
| Others | 1 | 1.25% |
| Total | 30 | 37.5% |

Discussion

Our study showed that the mean age of the subjects was 57.4 years. Out of 80, 48 were males and 32 were females. Smilowitz NR et al [11] performed a retrospective comparison of adults undergoing knee, hip, or spine surgery at a tertiary care center during 2 year periods. A total of 5690 participants underwent 3075 joint and spine surgeries in the reference period and 2791 surgeries in the contemporary period. Mean age was 61±13 years, and 59% were female. In the overall population, incidence of myocardial injury, hemorrhage, and red blood cell transfusion were lower in the contemporary period. Among 614 participants with a preoperative diagnosis of coronary artery disease (CAD), inhospital aspirin use was significantly higher in the contemporary period; numerically, fewer participants developed myocardial injury, had hemorrhage, and had red blood cell transfusion in the contemporary vs reference period. In a large tertiary care center, the incidence of perioperative bleeding and cardiovascular events decreased over time. In participants with CAD, perioperative aspirin use increased and appears to be safe. We observed that post-operative hematological complications occurred in a total of 30 patients. Major bleeding occurred in 5 of our subjects.

Another study done by Oberweis BS et al [12] investigated mean age was 60.8 years, and 59% were women. Postoperative troponin was measured in 1,055 subjects (34.6%). Myocardial necrosis occurred in 179 cases (5.9%), and MI was coded in 20 (0.7%). Over 9,015 patient-years of follow-up, 111 deaths (3.6%) occurred. Long-term mortality was 16.8% in subjects with myocardial necrosis and 5.8% with a troponin in the normal range.

Acedillo RR et al [13] screened 9376 citations from multiple databases for cohort studies published between 1990 and 2011. Studies that met our inclusion criteria included patients undergoing any major surgery, with a sample size of at least 100 patients with chronic kidney disease. Their outcomes had to be compared with a reference group of at least 100 patients without chronic kidney disease. Our primary outcomes were (1) receipt of perioperative blood transfusions and (2) need for reoperation for reasons of bleeding. Twenty-three studies met our criteria for review (20 cardiac surgery, 3 non-cardiac surgery). Chronic kidney disease was associated with a greater risk of requiring blood transfusion (7 studies in cardiac surgery, totaling 22,718 patients) and weighted incidence in patients with normal kidney function was 53% and in chronic kidney disease was 73%; pooled odds ratio, 2.7 (95% confidence interval, 2.1-3.4). After adjustment for relevant factors, the association remained statistically significant in 4 studies. Chronic kidney disease was

associated with more reoperation for reasons of bleeding (14 studies in cardiac surgery, totaling 569,715 patients) and weighted incidence in patients with normal kidney function was 2.4% and in chronic kidney disease was 2.7%; pooled odds ratio, 1.6 (95% confidence interval, 1.3-1.8). However, after adjustment for relevant factors (as done in 5 studies), the association was no longer statistically significant. Chronic kidney disease is associated with perioperative bleeding but not bleeding that required reoperation. Further studies should stage chronic kidney disease with the modern system, better define bleeding outcomes, and guide intervention to improve the safety of surgery in this at-risk population.

The SSC is concerned with activity within the operating room. It requires a formal pause preoperatively for introductions and briefings followed by a second pause postoperatively for team debriefings. These practices are known to be associated with improved safety measures and interpersonal communication [14-16]. The underlying philosophy of the checklist is that a true team approach with good communication between operating team members is safer and more efficient than a hierarchical system that relies on individuals [17].

In this study despite a high percentage of urgent cases (10%), over 90% of patients had operations performed on scheduled operating lists where theatre staff knew each other preoperatively and were used to working together. This may be one reason why checklist use was not associated with a significant reduction in early major complications or mortality. Policies already in place [18-19] for reducing surgical risk to patients undergoing orthopaedic surgery may have also nullified potential benefits conferred by the checklist at our institution.

Conclusion

We concluded that hematological complications do occur in significant proportion of subjects undergoing various types of orthopedic surgeries. However, future studies with larger study group are recommended for assessing the correlation of hematological complications and prognosis of patients.

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