FACTORs CAUSING INFECTION IN SpINE SURGERY—A CROSS SECTIONAL STUDY BETWEEN SURGICAL TIME AND BLEED VOLUME

1 Dr. Suhasish Ray
1 Consultant Orthopaedic and Spine Surgeon, Kolkata

Corresponding author: Dr. Suhasish Ray, suhasishray@gmail.com

ABSTRACT

Hospital acquired infection is responsible for long hospital stays, increased cost, and mortality. Of the myriad factors associated with postoperative infections in spinal surgery a descriptive, retrospective, cross-sectional study was conducted in the spine surgery facilities under the aeges of spineservices-india (a teaching, research and spinal treatment facility in the city of Kolkata). India Pearson’s and Spearman’s correlation was calculated and all p < 0.05 values were considered significant. In this study the correlation between time of surgery and bleeding amount had the highest importance and relevance.

KEYWORDS: Hospital acquired infection, Spine surgery, Cross-sectional study, Surgical time bleeding amount.

INTRODUCTION

Surgical instrumentation techniques have given better outcomes in patients with many difficult-to-manage spine diseases. Many procedures require prolonged surgical times, extensive approaches, and the placement of large instrumentations. These often lead to postoperative complications, including infection in the surgical area. Postoperative infections have devastating sequelae, including osteomyelitis and these are often difficult to diagnose and treat [1]. Postoperative spinal infections are often a problem in many cases following successful surgical procedures [2]. They can occur in between 0.7% and 12% of patients, from 1% for lumbar discectomies to 1-2% for cervical spine surgery to 6% or more for lumbar spine surgery with instrumentation and/or fusion. Variety of risk factors for
infections following spine surgery can be divided into factors dependent on the patient and factors dependent on the surgeon [2], [3]. It is reported that they can occur in between 0.7% and 12% of patients, ranging from 1% for lumbar disectomies to 1-2% for cervical spine surgery to 6% or more for lumbar spine surgery with instrumentation and /or fusion, resulting in a rise in morbidity, mortality, and high health care costs [2], [3]. Variety of risk factors prevail for infections following spine surgery which can be divided into factors dependent on the patient and factors dependent on the surgeon. Host factors include age, obesity, urinary incontinence, smoking, malnutrition, neurological deficit, revision surgery, use of non-steroidal anti-inflammatory medication, posterior surgical approach, tumor resection, increased bleeding, prolonged surgical time, use of instrumentation, multilevel surgery, vertebral fusion, and the presence of 3 or more comorbid illnesses [3], [4], [5]. Included among the extrinsic factors are the absence of preoperative antibiotics, inadequate use of sterile techniques, and increased traffic in the operating room [5], [6]. In addition, unproven factors are fluoroscopy and drainage. Infections can occur both in deep and superficial tissues. The most common pathogens described are S. aureus and S. epidermidis [2]. Diagnosing an infection in the surgical site following spine surgery is often difficult, as with many deep infections which can present without symptoms. In many patients, surgical site infections occur 2 to 3 weeks following the surgical procedure, with symptoms of increased pain at the level of the surgical area, low-grade fever, local hyperthermia, pain, and exudates. Laboratory studies such as leukocyte count, C-reactive protein, erythrocyte sedimentation rate, and exudates cultures can help with the diagnosis [7], [8], [9].

MATERIALS AND METHODS

With prior approval by the Ethics and Review Board of the institution, a retrospective, descriptive study was conducted on the infectious process following spine surgery. 21 patients were identified with the diagnosis mentioned whose clinical records were requested, 14 of whom met the inclusion criteria. Six patients had imperfect clinical records and 1 patient incorrectly registered diagnosis were excluded. The final simple was made up of 14 patients. Statistical analysis and descriptive statistical analyses were performed. Type of sampling was non-probability sampling. Fourteen patients of which 11 female (78.6%)
and 3 male (21.4%) between 25-55 years (mean= 41.79 yrs). The most prevalent surgical sites were the lumbar region in 5 patients (35.7%) and the dorsolumbar region in 5 patients (35.7%), followed by the dorsal area in 3 patients (21.4%), and finally by the cervical region in 1 patient (7.1%). The posterior approach was used in all 14 patients (100%). In terms of etiological agents, S. epidermidis was documented in 5 patients (35.7%), S. aureus in 7 patients (50.0%), S. haemolyticus in 2 patients (14.2%). Friedman’s two way ANOVA, Pearson correlation and the Spearman correlation were performed, considering a value of p < 0.05 to be significant. Statistical analysis was done using SPSS software version 20, IBM, Inc [10], [11], [12].

RESULT
We found a significant correlation between surgical time and bleeding volume with post operative infection p < 0.05 (Figures 1, 2 and 3). But no relation between operation time, bleeding volume and type of infection, neither with age p > 0.05.

Figure no 1: Level of bleeding by patient evaluated.
Figure no 2: Surgical time by patient evaluated.

Figure no 3: Positive correlation between bleeding volume and surgical time.
DISCUSSION

Postoperative spinal infections are frequently a potential problem following successful surgical procedures [2]. According to reports published by Abdul-Jabbar [9], as well as by Pull ter Gunne [7], the most commonly isolated agent in postoperative infections of the spine is S. aureus, followed by S. epidermidis with E. coli identified less frequently. Our results show that in our environment the most common etiological agent was S. epidermidis followed by S. aureus and less frequently by S. haemolyticus, reflecting an inverse relationship to the results reported in the literature. The correlation that exists between surgical time and bleeding volume in this study confirms and supports the findings of Pull ter Gunne [3].

CONCLUSION

Infections present in patients following spine surgery have multifactorial origins, however, in this study we found greater significance and relevance in the correlation between bleeding volume and surgical time. We also determined that the most common etiological agent in our population was S. epidermidis, with S. aureus occurring less frequently, which is the opposite of the results reported in the literature. Thus, by identifying these risk factors, we can design a protocol and treatment guidelines to manage and reduce infections in patients following spine surgery.

The author declares that there are no potential conflicts of interest regarding this article.

REFERENCES


