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Original Research Article.

Evaluation of Postoperative Adverse Events in Patients with Diabetes Undergoing Orthopedic and ENT Surgeries at a Tertiary Care Hospital

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ABSTRACT

Background: Diabetes is a major public health problem that is approaching epidemic proportions globally. Stress related to surgery and anesthesia triggers the release of neuroendocrine hormones such as catecholamines and cortisol that can result in insulin resistance and hyperglycemia. Hence, the present study was conducted for assessing the postoperative adverse events in patients with diabetes undergoing orthopedic and ENT surgeries.

Materials & Methods: The present study was conducted for assessing the postoperative adverse events in patients with diabetes undergoing orthopedic and ENT surgeries. A total of 100 patients with presence of diabetes were enrolled. Complete demographic and clinical details of all the patients were obtained. Only those patients were enrolled which were scheduled to orthopedic and ENT surgeries were enrolled. All the patients were prepared for surgery. Baseline variables were assessed. Follow-up was done and adverse events were evaluated. All the results were assessed using SPSS software.

Results: Mean age of the patients was 51.3 years. 66 percent were males while remaining were females. The mean duration of diabetes was 11.6 years. Adverse events were seen in 25 percent of the patients. Delayed extubation, Circulatory disorders, non-healing of incision and Surgical site infection were seen in 12 percent, 8 percent, 3 percent and 2 percent of the patients.

Conclusion: Geriatric age and higher duration of diabetes were risk factors for postoperative adverse events among diabetic patients.

Key words: Diabetes, ENT, Orthopedic.

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INTRODUCTION

Diabetes is a major public health problem that is approaching epidemic proportions globally. Worldwide, the prevalence of chronic, noncommunicable diseases is increasing at an alarming rate. About 18 million people die every year from cardiovascular disease, for which diabetes and hypertension are major predisposing factors. Today, more than 1.7 billion adults worldwide are overweight, and 312 million of them are obese. In addition, at least 155 million children worldwide are overweight or obese. A diabetes epidemic is underway. According to an estimate of International Diabetes Federation comparative prevalence of Diabetes during 2007 is 8.0 % and likely to increase to 7.3% by 2025.[1-3] Stress related to surgery and anesthesia triggers the release of neuroendocrine hormones such as catecholamines and cortisol that can result in insulin resistance and hyperglycemia. Volume depletion, abrupt discontinuation of outpatient diabetes medications, and administration of steroids are frequent factors that also contribute to hyperglycemia. Even patients without prior history of diabetes can develop hyperglycemia in the setting of acute stress. When observed, an elevated hemoglobin A1c can distinguish a previously unrecognized diabetes or prediabetes condition from “de novo” stress hyperglycemia.[4-6]

Some postoperative patients may require enteral or parenteral nutrition. For recommendations on how to navigate these scenarios, it is best to reference the ADA Standards of Medical Care or the Endocrine Society Clinical Practice Guidelines on inpatient glycemic control in noncritical patients. It is important to monitor blood glucose levels even in previously normoglycemic patients as enteral/parenteral is known to cause hyperglycemia.[7,8] Hence; the present study was conducted for assessing the postoperative adverse events in patients with diabetes undergoing orthopedic and ENT surgeries.

MATERIALS & METHODS

The present study was conducted for assessing the postoperative adverse events in patients with diabetes undergoing orthopedic and ENT surgeries. A total of 100 patients with presence of diabetes were enrolled. Complete demographic and clinical details of all the patients were obtained. Only those patients were enrolled which were scheduled to orthopedic and ENT surgeries were enrolled. All the patients were prepared for surgery. Baseline variables were assessed. Follow-up was done and adverse events were evaluated.

RESULTS

The mean age of the patients was 51.3 years. 66 percent were males while remaining were females. The mean duration of diabetes was 11.6 years.

Adverse events were seen in 25 percent of the patients. Delayed extubation, Circulatory disorders, non-healing of incision and Surgical site infection was seen in 12 percent, 8 percent, 3 percent and 2 percent of the patients. Geriatric age and higher duration of diabetes were risk factors for postoperative adverse events.

Table 1: Demographic data

Demographic data	Number	Percentage
Mean age (years)	51.3	
Males	66	66
Females	34	34
Mean Duration of diabetes (years)	11.6	

Table 2: Adverse events

Adverse events	Number	Percentage
Delayed extubation	12	12
Circulatory disorders non-healing of incision	8	8
Surgical site infection	3	3
Others	2	2
Total	25	25

Table 3: Risk factors of adverse events

Risk factors	r-value	p-value
Male gender	0.221	0.752
Age more than 60 years	1.685	0.001 (Significant)
Duration of diabetes of more than 10 years	1.740	0.000 (Significant)
Postoperative antibiotic use	-0.958	0.000 (Significant)

DISCUSSION

Diabetes Mellitus (DM) is a rapidly growing chronic and multifactorial disease with a worldwide projection of 324 million diabetics by the year 2025. In Africa, the prevalence of diabetes is expected to rise by 98%, from 13.6 million at 2003 to 26.9 million at 2025. A similar increase (97%) is expected in the Middle East region with an estimated prevalence of 35.9 million diabetics by 2025. This emphasizes the health and economic threat diabetes poses in these countries as well as the importance of having recognized guidelines for the management of diabetes in order to prevent the complications and ensure a normal quality of life to the patients.[9, 10] Studies have shown that high pre-operative and peri-operative glucose and glycated haemoglobin (HbA1c) levels are associated with poor surgical outcomes. These findings have been seen in both elective and emergency surgery including spinal, vascular, colorectal, cardiac, trauma, breast, orthopaedic, neurosurgical, and hepatobiliary surgery. One study showed that the adverse outcomes include a greater than 50% increase in mortality, a 2.4- fold increase in the incidence of postoperative respiratory infections, a doubling of surgical site infections, a threefold increase in postoperative urinary tract infections, a doubling in the incidence of myocardial infarction, and an almost twofold increase in acute kidney injury. Paradoxically, there are some data to show that the outcomes of patients with diabetes may not be different from, or may indeed be better than, those without diabetes if the diagnosis is known before surgery.[11- 14] Hence; the present study was conducted for assessing the postoperative adverse events in patients with diabetes undergoing orthopedic and ENT surgeries.

The mean age of the patients was 51.3 years. 66 percent were males while remaining were females. The mean duration of diabetes was 11.6 years. Adverse events were seen in 25 percent of the patients. Delayed extubation, Circulatory disorders, non-healing of incision and Surgical site infection were seen in 12 percent, 8 percent, 3 percent and 2 percent of the patients. Geriatric age and higher duration of diabetes were risk factors for postoperative adverse events. Jan Bláha et al compared the effects of perioperative vs postoperative initiation of TGC on postoperative adverse events in cardiac surgery patients. In the whole cohort, perioperatively initiated TGC markedly reduced the number of postoperative complications despite only minimal improvement in glucose control. The positive effects of TGC on postoperative complications were driven by nondiabetic subjects, whereas no significant effect was seen in diabetic patients despite significantly better glucose control in the perioperative group. Perioperative initiation of intensive insulin therapy during cardiac

surgery reduces postoperative morbidity in nondiabetic patients while having a minimal effect in diabetic subjects.[15] Previous analyses have demonstrated an association between glucose control and increased hospital utilization. Evans at al evaluated the relationships between hyperglycemia and hospital LOS in an acute medical unit, finding that LOS for patients with hyperglycemia on admission was significantly longer. In the cardiac population, Greco et al demonstrated that hyperglycemia was associated with an additional cost and longer hospital LOS. Ables et al also demonstrated that glycemic control shortens the LOS in noncritically hospitalized patients.[16- 18]

Wallaert B et al analyzed associations between diabetes type and outcomes after LEB in patients with critical limb ischemia. They performed a retrospective analysis of 1977 infrainguinal LEB operations done for critical limb ischemia within the Vascular Study Group of New England. Patients were categorized as nondiabetic (ND), noninsulin-dependent diabetic (NIDD), or insulin-dependent diabetic (IDD) based on their preoperative medication regimen. Our main outcome measures were in-hospital mortality and major adverse events (MAEs) – a composite outcome, including myocardial infarction, dysrhythmia, congestive heart failure, wound infection, renal insufficiency, and major amputation. They compared crude and adjusted rates of mortality and MAEs using logistic regression across diabetes categories. Overall, 41% of patients were ND, 28% were NIDD, and 31% were IDD. Crude rates of in-hospital mortality were similar across these groups. Adjusted analyses accounting for differences in patient characteristics showed that diabetes is not associated with increased risk of in-hospital mortality. However, type of diabetes was associated with a higher risk of MAEs in both crude and adjusted analyses. Diabetes is a significant contributor to the risk of postoperative complications after LEB surgery, and insulin dependence is associated with higher risk.[19]

CONCLUSION

Geriatric age and higher duration of diabetes were risk factors for postoperative adverse events among diabetic patients.

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