

Original Research Article

Frequency and risk factors of wound complications in type II diabetic patients undergoing abdominal surgery

Abstract

Introduction: Poorly controlled type II diabetes is associated with an array of micro-vascular, macro-vascular, and neuropathic complications. **Objectives:** The main objective of the study is to analyse the frequency of wound complications in type II diabetic patients undergoing abdominal surgery. **Material and methods:** This cross sectional study was conducted in THQ haveli lakha, Okara with the collaboration of Sir Ganga Ram Hospital, Lahore during March 2021 to August 2021. The data was collected with the permission of ethical committee of hospital. The data was collected through non-probability consecutive sampling technique. There were 120 patients which were enrolled in this study according to the inclusion and exclusion criteria. A systematically designed questionnaire was made for the collection of data. **Results:** The data was collected from 120 patients. The mean age was 55.5 ± 2.57 years. Most of the participants was male (51.1%), non-smokers (95.6%) and didn't have hypertension (67.8%). The mean time of diabetes mellitus was 6.1 ± 5.6 a long time. The majority didn't have neuropathy (81.1%), peripheral strokes (90.0%), pre-ulcerous states (90.0%), insensitive (89.9%), crevices on feet (64.4%), nail pathology (97.1%), injury disfigurement (93.3%) or incapacity (94.4%). **Conclusion:** It is concluded that it is difficult to treat the wound complication in diabetic patients. Diabetic patients are at an increased risk of postoperative surgical site infection while undergoing open surgery, laparoscopic cholecystectomy has no increased morbidity in diabetic patients as compared to non-diabetic patients.

Introduction

Poorly controlled type II diabetes is associated with an array of micro-vascular, macro-vascular, and neuropathic complications. Diabetes mellitus is most common due to autoimmune type (Type 1) or adult-onset diabetes (Type 2). Prevalence of diabetes in the Indian subcontinent is estimated to be 12%. Diabetes has been associated with a significantly increased rate of wound infection following open surgical procedures¹. It is also thought to be one of the risk factors of conversion to open laparoscopic procedure and believed to be associated with increased

morbidity as compared to non-diabetic patients undergoing the same procedure. Diabetes is one of the factors that increases a surgical patient's risk for postoperative infection².

Diabetic wound complications are the most common cause of non-traumatic lower extremity amputations in the industrialized world. The danger of lower furthest point removal is 15 to multiple times higher in diabetics than in people who don't have diabetes mellitus. Moreover, twisted confusions are the most successive purpose behind hospitalization in patients with diabetes, representing up to 25 percent of all diabetic confirmations in the United States and Great Britain³.

Abdominal surgery is one of the commonest surgery performed in secondary care as well as tertiary care teaching hospitals all over the world. Usually the complication rate in controlled settings is not very high and wound healing take place in a week or two with functional recovery of almost all the patients without any premorbid factors. Common wound complications of various types of abdominal surgeries include bleeding, wound herniation, wound infection etc. Many factors predispose the individuals towards the wound complications and delay in the recovery. Systemic illnesses including diabetes predispose the individual towards the wound⁴.

Wound ulcers is a disabling complication and not uncommon among people with diabetes mellitus. The incapacity and conceivable movement to the misfortune (removal) of digits and appendages make it a difficult issue⁵. This investigation endeavored to analyze the danger factors for twisted ulceration because of stomach a medical procedure in sort II DM patients. Wound heartbeats were utilized in the clinical appraisal, and their nonattendance is normally connected with an ABI of <0.769. Past examinations indicated that a higher bit of patients with tumors,

cracks, and cardiovascular and cerebrovascular infections was found in the diabetic population than in the ordinary population and along these lines a higher part of patients with diabetes mellitus was seen in those requiring careful treatments⁶.

Objectives

The main objective of the study is to analyse the frequency of wound complications in type II diabetic patients undergoing abdominal surgery.

Material and methods

This cross sectional study was conducted in THQ haveli lakha, Okara with the collaboration of Sir Ganga Ram Hospital, Lahore during March 2021 to August 2021. The data was collected with the permission of ethical committee of hospital.

Exclusion criteria

1. Patients who were going through second a medical procedure in under one month time were additionally avoided.
2. Not willing to participate.
3. Taking any anticoagulant drug.

Inclusion criteria

1. All the patients age range 20 to 60 years and suffering from type II DM were included in this study.
2. Willing to participate.

3. Who underwent any type of abdominal surgery.

Collection of data

The data was collected through non-probability consecutive sampling technique. There were 120 patients which were enrolled in this study according to the inclusion and exclusion criteria. A systematically designed questionnaire was made for the collection of data. A wide range of routine abdominal medical procedures aside from those done. A questionnaire survey including age, sex, BMI, diabetes term, sort of treatment, HbA1C, distortion, neuropathy indications, vascular manifestations, history of twisted, reason of stomach a medical procedure, past preparing with respect to wound care, smoking, history of retinopathy and nephropathy was finished for all patients. Questions with respect to indications of neuropathy and vascular issue including deadness and shivering of toes and legs, skin staining and wound ulcer or removal were asked from the patients. Postoperative infection (during hospital stay, at 1 and 4 weeks) was recorded and compared in both groups of patients.

Data was recorded, collected, organized and analyzed according to prescribed proforma. Statistical analysis for p-values of numerical data was done using SPSS version 19. Numerical variables, i.e. age, were calculated as mean \pm SD.

Results

The data was collected from 120 patients. The mean age was 55.5 ± 2.57 years. Most of the participants was male (51.1%), non-smokers (95.6%) and didn't have hypertension (67.8%). The mean time of diabetes mellitus was 6.1 ± 5.6 a long time. The majority didn't have neuropathy (81.1%), peripheral strokes (90.0%), pre-ulcerous states (90.0%), insensitive (89.9%), crevices

on feet (64.4%), nail pathology (97.1%), injury disfigurement (93.3%) or incapacity (94.4%).
The larger part were on treatment with diet and oral enemy of diabetic prescription (90.0%).

Table 1: Risk factors for developing wound in patients with diabetes mellitus

Characteristic	Cases <i>n</i> (%)	Univariate statistics		Multivariate statistics	
		Odds ratio (95% CI)	<i>P</i> -value	Adjusted odds ratios (95% CI) ¹	<i>P</i> -value
Gender- Male	22 (48.9)	0.84 (0.37- 1.91)	0.673	0.83 (0.36- 1.90)	0.652
Body mass index >25	24 (54.5)	0.88 (0.38- 2.03)	0.759	1.27 (0.55- 2.95)	0.578
Smoker	2 (4.4)	2.00 (0.18- 22.89)	0.570	2.47 (0.21- 29.76)	0.477
Duration of diabetes in years >3	28 (62.2)	1.72 (0.74- 3.99)	0.203	1.20 (0.52- 2.78)	0.669
Treated with anti- hyperglycemic medication or insulin	33 (82.5)	2.36 (0.82- 6.76)	0.106	2.39 (0.82- 6.92)	0.11
Treated with insulin	8 (17.8)	9.51 (1.14- 79.60)	0.014	11.05 (1.29- 94.54)	0.028
Undergoing abdominal surgery	34 (18.9)	2.39 (0.92- 5.76)	0.01	2.39 (0.92- 5.76)	0.06

Longer duration of illness and high BMI also had significant association with the presence of wound complication among the patients undergoing abdominal surgery as summarized in table

02.

Table 02: The correlated factors relating to presence of wound complications among the Patients with type II diabetes undergoing abdominal surgery

Parameters	<i>p</i> -value	Odds Ratio	Confidence Interval	
			Lower	Upper
Age	0.552	0.883	0.373	2.095
Duration of illness	<0.001	13.088	3.978	43.066
Gender	0.540	1.239	0.612	2.511
BMI	<0.001	4.228	1.998	8.947

Discussion

General a medical procedure was autonomously connected with postoperative antagonistic occasions in patients with diabetes, contrasted and elective muscular medical procedure. General a medical procedure covers a wide assortment of medical procedure types to a wide assortment of organs, a significant number of them being fundamental organs (e.g., throat, stomach, little inside, colon, liver, pancreas, gallbladder, and bile ducts)⁷⁻⁹.

Wound infection has been stated to be higher in diabetic patients. A number of studies involving various surgical procedures have been documented that postoperative complications in diabetic patients are higher as compared to non-diabetic patients¹⁰. This is believed to be due to impaired immunity. Most of the trauma of an open procedure is inflicted because the surgeons have a

wound large enough to give adequate exposure for safe dissection at the target site. The wound is often the cause of morbidity. With regards to open cholecystectomy, it has been documented that SSI is higher in diabetic patients as compared to non-diabetic patients¹¹.

Conclusion

It is concluded that it is difficult to treat the wound complication in diabetic patients. Diabetic patients are at an increased risk of postoperative surgical site infection while undergoing open surgery, laparoscopic cholecystectomy has no increased morbidity in diabetic patients as compared to non-diabetic patients.

References

1. Maqsood, R., Ans, M., Malhi, A., Mahmood, K., Afzal, H., & Zulfiqar, U. (2020). WOUND COMPLICATIONS DUE TO DIABETES IN PATIENTS UNDERGOING ABDOMINAL SURGERY. *PAFMJ*, 70(1), 3-7. Retrieved from <https://www.pafmj.org/index.php/PAFMJ/article/view/3919>
2. Maruyama K, Sato S. Effect of high-glucose conditions on human periodontal ligament endothelial cells: in vitro analysis. *Odontology* 2017;105:76–83.
3. Donatelli F, Vavassori A, Bonfanti S, et al. Epidural anesthesia and analgesia decrease the postoperative incidence of insulin resistance in preoperative insulin-resistant subjects only. *Anesth Analg* 2007;104:1587–93.
4. Ndip EA, Tchakonte B, Mbanya JC. A study of the prevalence and risk factors of wound problems in a population of diabetic patients in Cameroon. *Int J Low Extreme Wounds*. 2006;5(2):83–88.

5. Pscherer S, Dippel FW, Lauterbach S, Kostev K. Amputation rate and risk factors in type 2 patients with diabetic wound syndrome under real-life conditions in Germany. *Prim Care Diabetes*. 2012;6(3):241–246
6. Severgnini P, Slmo G, Lanza C, Chiesa A, Frigerio A, Bacuzzi A, et al. Protective mechanical ventilation during general anesthesia for open abdominal surgery improve postoperative pulmonary function. *Anesthesiology*. 2013;118(6):1307–21.
7. Tekkis PP, Prytherch DR, Kocher HM, Senapati A, Poloniecki JD, Stamatakis JD, et al. Development of a dedicated risk-adjustment scoring system for colorectal surgery (Colorectal POSSUM) *Br J Surg*. 2004;91(9):1174–82.
8. Al-Mulhim AR. The outcome of laparoscopic cholecystectomy in diabetic patients: a prospective study. *J Laparoendosc Adv Surg Tech A* 2010; 20:417-20.
9. Muhammad Umair Zulfiqar, Umer Fayyaz Ghani, Ayub Ashraf Mallhi, Khalid Mahmood, Maria Iqbal, Muhammad Ans, BACTERIOLOGICAL PROFILE OF DIABETIC FOOT INFECTIONS AND ITS EFFECTS ON LIMB SALVATION , *PAFMJ: Vol 71 No 2 (2021): April*
10. Rasikh Maqsood, Tanveer Abbas, Muhammad Talha Akhtar, Muhammad Usama Akhtar, Muhammad Ayub Ashraf Mallhi, Mubashar Ahmad Bajwa, ACCURACY OF CA-125 CONCENTRATION AS PREDICTOR OF PERITONEAL DISSEMINATION OF COLO-RECTAL CARCINOMA , *PAFMJ: Vol 68 No 6 (2018): Vol 68 No 6 (2018): December*
11. Muhammad Majid, Rasikh Maqsood, Muhammad Ali, Muhammad Ayub Ashraf Malhi, Zaki Hussain, Muhammad Hanif Abbasi, COMPARISON OF ALVARADO SCORE AND RIPASA SCORE IN THE ACCURATE DIAGNOSIS OF ACUTE

APPENDICITIS IN COMBINED MILITARY HOSPITAL RAWALPINDI , PAFMJ:

Vol 71 No 5 (2021): October

UNDER PEER REVIEW

UNDER PEER REVIEW