

# Incidence of Diabetes Mellitus and its Complications in Patients Coming to Anesthesia Department of SGRH for General Surgical and Gynaecological Procedures

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## ABSTRACT

**Aim:** To determine the frequency of diabetes and its complications in patients coming for general surgical and gynaecological procedures.

**Study Design:** Observational study.

Duration of study: From January 2014 to April 2014

**Methods:** This study was conducted in the general and gynaecological operation theatres of Sir Ganga Ram Hospital Lahore. A total of 821 patients were included in the study. Out of that 725 patients were non diabetic and 96 patients were diabetic. All patients were investigated through standard laboratory tests. The data was collected on a specially designed proforma and was analysed by SPSS version 17.

**Results:** A total of 821 patients came for general surgical and gynaecological procedures. Out of that 725 (87%) patients were non diabetic and 96(13%) were diabetic. Out of 96 diabetic patients 63(66%) were females and 33(34%) were males. Male to female ratio was 1:2. Diabetic complications like retinopathy, gastropresis, autonomic neuropathy, microangiopathy and ischaemic heart disease were observed in 42.7% diabetic patients.

**Conclusion:** Prevalence of diabetes and its complications is high among surgical patients. There is a need to educate and create awareness about diabetes and its complications. Further studies are required to be conducted at multiple centres to know the more precise incidence of diabetes mellitus and its complications.

**Keywords:** Diabetes, incidence, complications.

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## INTRODUCTION

Diabetes Mellitus is a group of metabolic disorders that share the phenotype of hyperglycemia resulting from defect in insulin secretion, its action or both. The chronic hyperglycaemia is associated with long term damage, dysfunction and failure of various organs esp. the eyes, kidney, heart, nerves and blood vessels<sup>1</sup>. Long term complications of diabetes mellitus include retinopathy with potential loss of vision, nephropathy leading to renal failure, peripheral neuropathy with risk of developing diabetic foot, carbuncle on the back and autonomic neuropathy causing gastrointestinal, genitourinary, cardiovascular and sexual dysfunctions<sup>2</sup>. Patients with diabetes mellitus have an increased incidence of atherosclerotic, cardiovascular, peripheral arterial and cerebrovascular disease, hypertension and abnormalities of lipoprotein metabolism<sup>3</sup>. The Diabetes Control and Complications Trial demonstrated that interventions which improve glycemic control in diabetic patients reduce the risk of

development and slow the progression of diabetic microvascular disease<sup>4</sup>. Diabetes is a major public health problem and the global prevalence continues to rise<sup>5</sup>. Framingham Heart Study shows that the incidence of type 2 diabetes has doubled over the last 30 years<sup>6</sup>.

The current prevalence of diabetes in Pakistan is 12.8%. The prevalence of newly diagnosed diabetic patients is 5.1% in men and 6.8% in women in urban population while 5% in men and 4.8% in women in rural areas<sup>7</sup>. Escalation in rates of diabetes, especially type 2 in Pakistan posing threats to the economy and quality of life of people due to poor glycemic control and very high rates of complications<sup>8,9</sup>. Patients with diabetes are more likely to under go surgery than those without it. The association between hyperglycemia and increased risk of hospital complications and mortality in diabetic patients undergoing cardiovascular surgery is well established<sup>10</sup>. Less information is available on the significance of hyperglycemia in those undergoing general and noncardiac surgery. This study is conducted to find the incidence of diabetes and its complications among surgical patients.

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## MATERIAL AND METHODS

This was an observational study and was carried out at SGRH, a tertiary care hospital at Lahore. The study was conducted from January to April 2014 after approval of the ethical committee of hospital. In total, 821 adult patients of either gender coming to Anesthesia Department for general surgical and gynaecological procedures were included in the study. Patients coming for minor surgeries receiving no or local anesthesia were excluded from the study. Each patient was thoroughly investigated with the help of specialized laboratory tests. Diabetes mellitus was diagnosed following the criteria of the WHO of a fasting plasma glucose  $>7.0\text{mmol/l}$  or 2 hr post prandial plasma glucose level of  $>11.1\text{mmol/l}$ . The complete data of patients was recorded using a specifically designed proforma and was analysed by using SPSS version 17. The frequency and percentage of diabetic vs nondiabetic were calculated and presented. The frequency and percentage were also calculated for gender distribution. The mean and standard deviations were calculated for age.

## RESULTS

Total 821 adult patients came for surgeries in the general and gynae operation theatres to the department of Anesthesia. Out of that 725 patients (87%) were nondiabetic and 96 patients (13%) were diabetic. Out of 96 diabetic patients, 63(66%) were female and 33(34%) were male. Regarding the management of diabetes, out of 96 patients, 88(91%) were taking antidiabetic medications along with dietary restrictions. Out of 88 patients 52(54%) were on oral hypoglycemic agents, 24(25%) were using insulin, 4(4%) were using both oral hypoglycemics and insulin, while 8 patients (8%) were on dietary restrictions only.

Out of total 96 diabetic patients its complications were observed in 41(42.7%) patients which includes gastroparesis, autonomic neuropathy, retinopathy, microangiopathy, neuropathy, ischaemic heart disease and transient ischaemic attacks. Out of 52 patients who were using oral hypoglycemic, diabetic complications were observed in 30(31%) patients. Out of 24 patients who were using insulin, diabetic complications were present in 4(16%) patients. Out of 4 patients using both insulin and oral hypoglycemics, complications were observed in 2(50%) patients.

Out of 54 patients using oral hypoglycemic, 20(37%) were using Sulphonylureas, 29(54%) were using Biguanides, 3(5%) were using d-glucosidase inhibitor, 2(4%) were using dipeptidyl peptidase 4 inhibitor. Among 47 patients using insulin, 28(60%) were on regular insulin and 19(40%) were on NPH

70/30. Among all diabetic patients compliance was good in 49(51%), average in 3(3%) and poor in 44(45%) patients.

### Frequency of diabetic vs non diabetic

Diabetes mellitus	n	%age
Yes	96	13
No	725	87

### Gender distribution of diabetes

Gender	n	%age
Male	33	34
Female	63	66

### Management of Diabètes Mellitus

Management	n	%age
Diet control only	8	8
Diet control +oral hypoglycemic	52	54
Diet control+insulin	24	25
Diet control+insulin+oral hypoglycemic	4	4

### Distribution of Complications among patients on different antidiabetic regimens

Complications	n	%age
In patients on dietary management only	5	5
In patients on oral hypoglycemic only	30	34
In patients on oral hypoglycemic+insulin	2	2
In patients on insulin only	4	4

### Types of oral hypoglycemics

Types	n	%age
Sulphonyl ureas	20	37
Biguanides	29	53
d-glucosidase inhibitor	3	5
Dipeptidyl peptidase 4 inhibitor	2	4

### Types of insulin

Insulin	n	%age
Regular	28	60
NPH(Neutral Protamine Hagedron)	19	40

### Compliance of patients

Compliance	n	%age
Good	49	51
Average	3	4
Poor	44	45

## DISCUSSION

Diabetes mellitus is a major health problem and its worldwide prevalence continues to rise. Prevalence of diabetes mellitus in Pakistan is high ranging from 7.6 to 11%. Variations according to age, sex location, urbanization and socio-economic instability have been noted. In the absence of major interventions, Pakistan in 2030 will have an estimated 11.4 million

persons with diabetes mellitus and its over all prevalence of 8.9%<sup>11</sup>. Patients with diabetes mellitus are more likely to undergo surgeries than those without it. Surgery in diabetic patients is associated with longer hospital stay and greater perioperative morbidity and mortality than in non diabetic patients<sup>12</sup>. This is related in part to the high incidence of comorbid conditions like coronary heart disease, hypertension and renal insufficiency as well as the adverse effects of hyperglycemia in clinical outcome<sup>13</sup>. Evidence from observational studies suggests that in surgical patients with diabetes mellitus, improvement in glycemic control decreases morbidity and mortality<sup>14</sup>.

In Pakistan, most of the studies have reported incidence of diabetes mellitus and its risk factors in general population and very few studies are conducted to find its incidence among surgical patients. This study was conducted with the aim to find the incidence and complications of diabetes among surgical patients. Our study presents the results of data collected from an observational study conducted in patients who came to anesthesia department of Sir Ganga Ram Hospital for general surgical and gynaecological procedures. Frequency of diabetes mellitus among these patients was found to be 96(13%) in this study. These results are concordant with already published data for Pakistan<sup>8,9</sup>.

The results of our study are different from the study conducted by Ejaz MS et al<sup>15</sup>. They reported frequency of diabetic patients 49(10.7%). out of which 63.4% were male and 36.6% were female. Where as in our study 33(34%) were male and 63(66%) were female. With an overall incidence of diabetes mellitus 13% and among them 4.3% were male and 8.6% were female. Basit and his associates reported 7.2% incidence of diabetes mellitus in Pakistan, (10.1%) in males and (4.3%) in females<sup>16</sup>. This difference in results of both studies from our study could be due to the fact that they have recorded their results by observing general population, where as we have conducted our study among general surgical and gynaecological patients. Trivedi ML et al found in their study that 8% of the population in United States is affected by diabetes mellitus. The prevalence of diabetes mellitus is even higher in hospitalized patients (12-25%). According to their study, an estimated 25% of diabetic patients required surgeries. Mortality rates in diabetic patients have been estimated to be up to 5 times greater than in non diabetics, often related to the end organ damage caused by the disease<sup>17</sup>. The incidence of diabetes among surgical patients in their study is similar to that observed in our study.

In our study, diabetic complications were observed in 42.7% patients which include retinopathy, gastroparesis, autonomic neuropathy, microangiopathy, nephropathy, transient ischaemic attacks and ischaemic heart disease. Out of the 52(54%) patients who were using oral hypoglycemic agents, diabetic complications were observed in 31%. Out of 25% patients who were using insulin, diabetic complications were observed in 16% and out of 4% patients using both insulin and oral hypoglycemic agents, complications were observed in 50%. In our study we observed less diabetic complications in patients on insulin therapy than in patients using oral hypoglycemic agents. Shailesh K and his colleagues in their study reported 44.32% incidence of diabetic complications among surgical patients which is close to the one observed in our study<sup>18</sup>.

We observed good compliance in 49(51%), average in 3(4%) and poor in 44(45%) of diabetic patients. Based on the estimates reported in previous studies conducted in Pakistan, an impending epidemic of diabetic complications is feared as most patients attending tertiary care hospital had undiagnosed diabetes mellitus<sup>2,19</sup>. When such patients are diagnosed in hospital, it is likely that they might have already suffered from end organ damage at the time of diagnosis.

As this study was conducted only at one centre among patients coming for general surgical and gynaecological procedures, therefore generalizability of findings is limited. A more representative sample could have been obtained by involving multiple centres and by conducting study in patients coming to other surgical specialities.

## CONCLUSION

Our study confirmed the high prevalence of diabetes and its complications among surgical patients. Early detection of diabetes and its management in high risk group could reduce its overall incidence and complications rate. There is a need to educate and create awareness about diabetes mellitus. Clinicians should pay special attention to those who are diagnosed with diabetes in a hospital set up. Further patients are likely to benefit from conducting study and collecting data from multiple centers.

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