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FREQUENCY OF GALLSTONES IN PATIENTS WITH DIABETES MELLITUS (A HOSPITAL BASED MULTIDISCIPLINARY STUDY)

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ABSTRACT

OBJECTIVE: *To determine the frequency of gallstones in patients with diabetes mellitus*
PATIEHTS AND METHODS: *This cross sectional type descriptive study was conducted in the department of Medicine and General surgery at Liaquat University Hospital (a tertiary care teaching hospital) Hyderabad and at tertiary care hospital attached with Ghulam Muhammad Maher Medical College from March 2009 to August 2009. All the patients were known cases of diabetes mellitus, of >5 year duration, presented with acute abdominal pain, were further evaluated for the presence of gallstones. The patients were also assessed for their diabetes and serum lipid status. The data was collected, saved and analyzed in SPSS version 10.00 and the frequency and percentage of gallstone in patients with diabetes mellitus was calculated.*
RESULT: *Out of 104 patients with diabetes mellitus, 72(70%) had gallstones, mean age 45.73 ± 6.53, male 24(33%) and female 48(67%) respectively. The upper right part of the abdomen was observed in all 104 subjects, fever in 60/72 (83%) patients, nausea and vomiting in 48/72(67%) patients, loss of appetite in 35/72 (49%) patients, feeling of tired or weakness in 60/72 (83%) patients, headache in 42/72 (58%) patients, chills in 58/72(81%) patients, pain in the back 55/72 (76%) patients, pain under the right shoulder in 38/72 (53%) patients, belching in 45/72 (63%) patients, indigestion in 53/72 (74%) patients. The serum cholesterol was raised in 32 patients, low density lipoprotein was elevated in 20 patients and serum triglycerides was raised in 27 patients*
CONCLUSION: *The patients with raised blood glucose level (diabetes mellitus) are more prone to develop gall stones (cholelithiasis).*

KEY WORDS: gallstones, diabetes mellitus, cholilithiasis

INTRODUCTION:

Gallstones (chole = "bile", lithia = "stone", and -sis = "process") are the most common digestive disease causing huge hospitalizations annually worldwide.[1]Women are twice as likely as men to develop gallstones; the higher prevalence of gallstones in women is thought to be caused by multiple pregnancies and obesity.[2]Over half a million people undergo cholecystectomy (surgical removal of the gallbladder) each year. In recent years, the development of laparoscopic cholecystectomy has significantly reduced hospital inpatient costs and recovery time, but this cost saving has been offset by an increase in the number of cholecystectomies.[3]

Gallstones can occur anywhere within the biliary tree, including the gallbladder and the common bile duct. Obstruction of the common bile duct is called choledocholithiasis; obstruction of the biliary tree can cause jaundice; obstruction of the outlet of the pancreatic exocrine system can cause pancreatitis. Cholelithiasis is a term used for the presence of stones in the gallbladder.[4]

Risk factors for cholelithiasis include age, hypertriglyceridemia, genetics, various medications (such as estrogens, clofibrate and ceftriaxone), terminal ileal resection, and gallbladder hypomotility as seen in post-vagotomy and total parenteral nutrition.[5]Ultrasound remains the primary modality for imaging the biliary system and is particularly successful for examining the gallbladder. A gallstone appears as an echogenic structure within the gallbladder lumen that casts a distal acoustic shadow. Sonography is accurate in the diagnosis of gallstones in the gallbladder in up to 96% of patients.[6]

Diabetes is a condition in which the body either does not produce enough, or does not properly respond to insulin. This causes glucose to accumulate in the blood (hyperglycemia),

leading to various potential complications. The prevalence of diabetes mellitus in Pakistan is 20%.[7] People with diabetes are at higher risk for gallstones and have a higher than average risk for acalculous gallbladder disease (beside stones). Gallbladder disease may progress more rapidly in patients with diabetes, who tend to suffer worse infections in general. The reported prevalence of gallstone in diabetes mellitus is 15%.[8]

There was no any former study conducted on such theme in our setup, therefore by considering all such discussion and dire need in mind, the present study was conducted in the tertiary care teaching hospital of Hyderabad. The study focused on the frequency of gallstones in patients with diabetes mellitus by giving the rationale of proper workup and management of patients with gallstone in relation to diabetes mellitus.

PATIENTS AND METHODS:

This cross sectional type descriptive study was conducted in the department of Medicine and General Surgery at Liaquat University Hospital (a tertiary care teaching hospital) Hyderabad and at tertiary care hospital attached with Ghulam Muhammad Maher Medical College, Sindh, Pakistan from March 2009 to August 2009. All the patients were known cases of diabetes mellitus (of > 5 years duration) presented with acute abdominal pain were further evaluated for the presence of gallstones. The detail history of all such patients was taken and complete physical and relevant clinical examination was performed. The sample size for the study was calculated by assessing the prevalence of gallstones in diabetes mellitus (15%) with 7% margin of error. The routine biochemical parameters were followed whereas specific and related investigations i.e. hemoglobin A1C (HbA1c) and lipid profile was also determined to assess its current status. For the detection of gallstones the abdominal ultrasound was performed by expert sonologist had experience of > 5 years. The informed consent was taken from every patient or from attendant of patients after full explanation of procedure regarding the study, and all such maneuvers was performed under medical ethics and through the cooperation of whole research fellows of both departments. The particular and specific data was recorded on pre-design proforma. The diabetic patients attended the surgery OPD / wards with history of abdominal pain and were diagnosed as cases of cholelithiasis were also included in the study. The exclusion criteria of the study were; patients <12 years of age and non cooperative subjects, who refused to give written consent for participation in the study. Regarding ethical justification all the expenses of this study was paid through valuable cooperation of whole research team.

The data was entered, saved and analyzed in SPSS version 10.00. The frequency and percentage of gallstone was calculated in patients with diabetes mellitus. The frequency and percentage was also calculated for gender distribution. The mean and standard deviation was calculated for age.

RESULTS:

Out of 104 patients with diabetes mellitus, 72(70%) had gallstones with mean age 45.73 ± 6.531. The observation of the study is mentioned in Table: 01. Of 104, 39 (38%) were males and 65 (62%) were females, 53/104 (51%) patients presented through causality outpatient department (COD), 21/104 (20%) through outpatient department (OPD) and 34/104 (33%) were referred from different wards i.e. department of General Surgery where they were initially admitted but had history of diabetes mellitus and their blood sugar is not well controlled. The pain in upper right part of the abdomen was observed in all 104 subjects, fever in 60/72 (83%) patients, nausea and vomiting in 48/72(67%) patients, loss of appetite in 35/72 (49%) patients, feeling of tired or weakness in 60/72 (83%) patients, headache in 42/72 (58%) patients, chills in 58/72(81%) patients, pain in the back 55/72 (76%) patients, pain under the right shoulder in 38/72 (53%) patients, belching in 45/72 (63%) patients, indigestion in 53/72 (74%) patients. 44/72(61%) patients had reported family history of gallstones. 43/72 (60%) patients had raised serum glucose level and their HbA1c was also elevated and on inquiry it was found that 26 patients were not taken their anti-diabetic treatment in proper and regular manner. Further more dyslipidemia was observed in 58/72(81%) patients; the serum cholesterol was raised in 32 patients, low density lipoprotein was elevated in 20 patients and serum triglycerides was raised in 27 patients. After assessment and manage the diabetic parameters all referral patients were advised for surgery and then referred back to surgical department for expert opinion and specific management.

TABLE: 01
FREQUENCY OF GALL STONES IN DIABETIC PATIENTS

Gall Stones	*n* =104
Detected	72 (70%)
Not detected	32 (30%)

TABLE: 02
GENDER DISTRIBUTION OF DIABETIC PATIENTS WITH GALL STONES

GENDER	*n* =72
Male	24 (33%)
Female	48 (67%)

DISCUSSION:

Gallstone disease is one of the most common digestive diseases and the third National Health and Nutrition Examination Survey estimated that 6.3 million men and 14.2 million women aged 20 to 74 in the United States had gallbladder disease.[9]In our study the prevalence of gallstone identified is 70%; however it was 14.3% in the study of Méndez-Sánchez et al.[10] where as 15% prevalence of gallstone was reported by a Swedish study.[11] Ultrasonography has played a major role in the diagnostic protocol, is risk free method and provide screening of large populations. There appears to be higher rates of cholelithiasis in western Caucasian, Hispanic, and Native American populations and lower rates in eastern European, African American, and Japanese populations.[12,13]In our study 61% patients had family history of gall stones; however the literature concerning family inheritance is scarce and study on 74 families with gall bladder diseases showed that gallstones were five times more common in families of affected individuals than in families of his control group and postulated that the presence of gallstones in wives and husbands of subjects with gallstones and also in siblings of the same sex of the wife or husband, demonstrating the data of a clear 2:1 ratio in favor of familial occurrence.[14]The clinical features of the subjects in our study is consistent with the study of Barie, et al.[15]In present study 81% patients had disturbed their lipid profile however it was also observed by Indian study conducted on "comparative study of serum lipid profile

and gallstone disease". [16]

In the present study an effort was made to determine the prevalence of gallbladder disorder i.e. gallstones in diabetic patients with the help of ultrasonography. The diabetic subjects are reported to have a two to three fold increase in the prevalence of cholesterol gallstone. Inadequate emptying of gallbladder and increased fasting gallbladder volume has been reported in various studies.[17]Hypomotility of gallbladder cause gallstone formation in diabetes mellitus and other chronic disorder like obesity, sclerosis and pregnancy. Secondly patients with diabetes generally have high levels of fatty acids called triglycerides and these fatty acids may increase the risk of gallstones. The prevalence of gallstone in diabetes mellitus reported by Saxena, et al was 30% and stated that the longer the duration of diabetes more are the chances of developing complications like gallstone formation in gallbladder.[18] where as in a study of 50 diabetic subjects was reported 32% prevalence of gallstone and 73.5% in diabetic females.[19]Malik et al, reported 12.7% prevalence of gallstones in 329 type2 diabetic patients of which 71.4% were females.[20]A study by Grimaldi, et al stated that the presence of both gallstone disease and diabetes greatly increased mortality in women.[21]

The current study highlights the frequency of gallstones in diabetic patients which has sound weight in the field of medicine and surgery. Further more, the present study initialized and open the forum of discussion and should be continued in more advance, modified and extended phase in different clinical settings to provide more information and deep knowledge of gall stones in the context of patients with diabetes mellitus.

CONCLUSION:

We observed that the patients with raised / uncontrolled blood glucose level (diabetes mellitus) are more prone to develop gall stones (cholelithiasis). Therefore proper diabetic control and early effective measures to manage cholelithiasis can save the patients to acquire life threatening complications.

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