**Gall Bladder: An Outcome of Acute Cholecystitis in diabetic and non diabetic patients**

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**Abstract**

**Objective:** To study the outcome of acute cholecystitis in both diabetic and non diabetic patients.

**Design:** Retrospective comparative study.

**Setting and duration:** Surgical units of Khalifa Gul Nawaz Teaching Hospital & DHQ Teaching Hospital Bannu KPK Pakistan from January 2007 to January 2012.

**Patients:** All the patients suffering from gallstones with or without diabetes mellitus.

**Methodology:** All patients, suffering from gallstones with or without diabetes mellitus, irrespective of age and sex underwent clinical evaluation and appropriate investigations special emphasis on diabetic related investigations. All these patients were subjected to open surgery and the results were analyzed. To assess the validity of this observation, a study of 400 diabetic and 600 non diabetic patients who underwent cholecystectomy were undertaken.

**Results:** In this six year of my experience regarding 1000 patients with gallstones who underwent surgery. Four hundred patients 400(40%) were diabetic, and 600(60%) were non diabetic. Among diabetic patients 70% were asymptomatic and 30% were symptomatic (acute calculus cholecystitis was 25% and 75% were acalculus). However in non diabetic patients 82% were asymptomatic (calculus cholecystitis 81.48% and 18.52% were acalculus). All the patients were undergone open surgery. The results were compared and tabulated. The rate of complications were nearly equal in diabetic and non diabetic.

**Conclusion:** Diabetes mellitus has been suggested as a risk factor in patients undergoing gallbladder surgery. In diabetic patients especially with renal and vascular disease resulted in a significant (p< 0.01) increase in morbidity and mortality rates. Therefore, we conclude that diabetes mellitus alone does not appear to adversely affect the prognosis of patients who require gallbladder surgery. Early surgery is recommended in diabetic patients.

**Keywords:** gallbladder; diabetes; cholecystitis; open cholecystectomy

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**Introduction:**

The gallbladder is a small pouch that lies just under the liver. The gallbladder stores bile produced by the liver. After meal, the gallbladder is empty and flat, like a deflated balloon. Before a meal, the gallbladder may be full of bile and about the size of a small pear. In response to signals, the gallbladder squeezes stored bile into the small intestine through a series of tubes called ducts. Bile helps digest fats, but the gallbladder itself is not essential. Removing the gallbladder in an otherwise healthy individual typically causes no observable problems with health or digestion yet there may be a small risk of diarrhea and fat malabsorption.

Biliary colic develops in 1 to 4% annually and acute cholecystitis eventually develops in about 20% of these asymptomatic patients if they are left untreated. Such patients tend to be somewhat older than those with uncomplicated. Although some controversy exist that diabetic patients generally are thought to have a two- to threefold increased risk of cholesterol...
gallstones. Diabetes has been reported to be one of risk factors for acute cholecystitis and complicated clinical course in patients with symptomatic cholelithiasis. Gallbladder motility is significantly impaired in diabetic patients due to autonomic neuropathy as compared with healthy subjects. An impairment of gallbladder motility may cause cholestasis and result in gallbladder stone growth. The mechanism of the gall-bladder emptying abnormality in diabetics is not completely understood, although it has been proposed that it could represent a manifestation of denervation. The mechanism of the gall-bladder emptying abnormality in diabetics is not completely understood, although it has been proposed that it could represent a manifestation of denervation caused by visceral neuropathy.

Based on normal post-prandial cholecystokinin release, it can be ruled out that impaired cholecystokinin release is the mechanism responsible for reduced gall-bladder emptying in diabetics. Other possible explanations for impaired gall-bladder contraction in diabetics include a decreased sensitivity of the smooth muscle of the gall-bladder to plasma cholecystokinin, and/or decreased cholecystokinin receptors on the gall-bladder wall caused by visceral neuropathy. Based on normal post-prandial cholecystokinin release, it can be ruled out that impaired cholecystokinin release is the mechanism responsible for reduced gall-bladder emptying in diabetics. Other possible explanations for impaired gall-bladder contraction in diabetics include a decreased sensitivity of the smooth muscle of the gall-bladder to plasma cholecystokinin, and/or decreased cholecystokinin receptors on the gall-bladder wall. This is picture of diabetic patient with acute cholecystitis having necrotizing wall of gallbladder.

**Patients and Methods:**
Those patients who were suffering from cholelithiasis were admitted either by outpatients or emergency department or referred by physicians. After clinical evaluation and relevant investigations all the patients were subjected to open surgery after taking informed consent for open surgery. Medically unfit patients of ASA III, IV and V were excluded from the study. Data was collected and analyzed and presented in the form of tables.

**Results:**
In this retrospective study, 1000 patients were admitted to the hospital with cholelithiasis among them 400 were known cases of diabetes mellitus and 600 were non diabetic. Male to female ratio were 1:5 and the age ranges from 15-80, the mean age were 45 years. All patients presents some sort of dyspepsia and recurrent attack of right hypochondrial pain, sometimes with nausea and vomiting, 15% of patients with acute phlegmonous cholecystitis with mass in right hypochondrium. Sonological reports shows 22% patients shows single stone while rest of patients shows multiple stones in their lumen. Wall thicknesses were noted in 65% of patients, empyema gall bladder in 15% of patients and mass on sonography in 35% of cases. On biochemical analysis TLC and LFTs were mildly raised due to acute cholecystitis. Acalculus cholecystitis were found in 73% of diabetic patients while 23% having calculus cholecystitis.

All the patients were subject to open cholecystectomy because of the experience of surgeon in open surgery; however laparoscopic cholecystectomy is a good option. Operative complications are very low in open surgery in both diabetic and non diabetic patients.

Wound infections are more common in diabetic patients than non diabetic patients while nausea and vomiting are more in non diabetic similarly loose motions.

**Discussion:**
Cholecystitis is defined as inflammation of the gallbladder that occurs most commonly because of an obstruction of the cystic duct from cholelithiasis. 90% of cases involve stones in the cystic duct (ie, calculous cholecystitis), with the other 10% of cases representing a calculous cholecystitis. Calculus cholecystitis is slightly less than this in my study while acalculus is more in diabetic and non diabetic patients.
Risk factors for cholecystitis include increasing age, female sex, certain ethnic groups, obesity or rapid weight loss, drugs, and pregnancy. Although bile cultures are positive for bacteria in 50-75% of cases, bacterial proliferation may be a result of cholecystitis and not the precipitating factor.13,14

A study by Cullen et al demonstrated the ability of endotoxin to cause necrosis, hemorrhage, areas of fibrin deposition, and extensive mucosal loss, consistent with an acute ischemic insult. Endotoxin also abolished the contractile response to CCK, leading to gallbladder stasis.14

Diabetic autonomic neuropathy causes gallbladder dysfunction5. Real-time sonography demonstrated that an impairment of gallbladder motility in type 1 and type 2 diabetic patients6,7. An impairment of gallbladder motility due to autonomic neuropathy may cause cholestasis and result in gallbladder stone formation and growth. A retrospective cohort study found an increased risk of biliary diseases in patients with type 2 diabetes8. Furthermore, diabetes has been reported to be one of risk factors for acute cholecystitis and a complicated clinical course in patients with symptomatic cholelithiasis4. Therefore, we are apt to diagnose diabetic patients manifesting symptoms of cholecystitis as having cholecystitis due to bacterial infection and cholelithiasis. In our study, the history of steroid use also leads us to diagnose acute bacterial infectious cholecystitis. The presence of leukocytosis and debris in abdominal ultrasound also supported the diagnosis of acute bacterial infectious cholecystitis. However, an abdominal operation demonstrated that inflammation and necrosis of gallbladder is usually present.

Torsion of the gallbladder is an extremely rare cause of acute surgical abdomen9. One of our patients was having torsion of gall bladder. The gallbladder torsion is defined as the rotation of the gallbladder on its mesentery along the axis of the cystic duct and cystic artery10. The presence of a floating gallbladder, a redundant mesentery,
is a prerequisite for the gallbladder torsion. This disease manifests symptoms mimicking acute infective cholecystitis, therefore, preoperative diagnosis of this disease is difficult and the definitive diagnosis is usually made during surgery.

Patients having diabetes and asymptomatic gallstones, there is some controversy exists regarding whether their gall bladder should be removed prophylactically. It has been stated that diabetic patients are particularly prone to biliary complications from their stones. This led some authors to advocate prophylactic cholecystectomy in asymptomatic diabetic patients. Although there is no evidence, however, that diabetes with asymptomatic stones are more likely than other patients either to become symptomatic with biliary colic or to suffer complications without first becoming symptomatic with biliary colic. However, diabetic patients do not have an increased morbidity or mortality from stone disease once other co morbidities such as cardiovascular disease and renal insufficiency are undertaken. Recent reports showing no difference in the incidence of symptoms, complications and mortality, which is comparable to my study. There is no clear benefit to prophylactic cholecystectomy in diabetic patients with asymptomatic gallstones.

Conclusion:
Diabetes mellitus has been suggested as a risk factor in patients undergoing gallbladder surgery especially with renal disease and vascular disease (with or without diabetes mellitus) resulted in a significant increase in morbidity and mortality rates (p< 0.01). Therefore, we conclude that diabetes mellitus alone does not appear to adversely affect the prognosis of patients who require gallbladder surgery. Early surgery however, is highly recommended in diabetics with symptomatic gallstones or acute cholecystitis.

References: