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A CRITICAL EVALUATION OF CLINICOPATHOLOGICAL STUDY ON LIVER FUNCTIONS IN POSTCHOLECYSTECTOMY CASES COMPARED TO PREOPERATIVE STATUS

Pathology

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ABSTRACT

INTRODUCTION: Gallstones [cholelithiasis] are the most common biliary pathology. It is estimated that gallstones affect 10-15% of the population in Western societies. They are asymptomatic in majority of cases (780). In the UK, the prevalence of gallstones at the time of death is estimated to be 17% and may be increasing. Approximately 1-2% of asymptomatic patients will develop symptoms requiring surgery per year, making cholecystectomy one of the most common operations performed by general surgeon. Gallstones are quite common in the general populations and women are affected more often in the ratio of 4:1.
AIMS AND OBJECTIVES: Assessment of hepatic status in pre- operative patients in comparison with postoperative patients. Comparative evaluations of derangement of hepatic parameters in the preoperative period of patient undergoing different forms of gallbladder operations (conventional or laparoscopic cholecystectomy). To evaluate the usual time required for return of deranged hepatic function, if any, to normal levels. To analyse the outcome of cholecystectomies in patients with symptomatic cholelithiasis for improvement in the preoperative symptoms.
MATERIALS AND METHODS: The study was conducted in a series of 60 cases of chronic calculus cholecystitis.Patients were selected from surgical outpatient Department of Darbhanga Medical College and Hospital. Laheriasarai. The tenure of study was from April 2019 to December 2020. A detailed clinical history was taken from every patient to ascertain the diagnosis of chronic calculus cholecystitis.
RESULTS AND ANALYSIS: The lump was localised in the right hypochondrium extending to the epigastrium or right lumbar region in some cases. The lump was tender and moves with respiration. Dowdy in 1969 described lump abdomen in 11.7% cases. The present findings corroborated with that of the other research groups.
CONCLUSION: Cholecystectomy appears to relieve most of the symptoms of gall stone disease. Biliary pain, nausea, vomiting and fatty food intolerance had better outcome compared to dyspepsia, flatulence and heart burn. Some patients tend to develop de novo symptoms in the post-operative period. Despite the persistence or appearance of new symptoms, most of the patients feel satisfied with the outcome of surgery.

KEYWORDS

Critical Evaluation, Clinicopathological Study, Liver Functions, Postcholecystectom And Preoperative Status

INTRODUCTION

Gallstones [cholelithiasis] are the most common biliary pathology. It is estimated that gallstones affect 10-15% of the population in Western societies. They are asymptomatic in majority of cases (780). In the UK, the prevalence of gallstones at the time of death is estimated to be 17% and may be increasing. Approximately 1-2% of asymptomatic patients will develop symptoms requiring surgery per year, making cholecystectomy one of the most common operations performed by general surgeon. Gallstones are quite common in the general populations and women are affected more often in the ratio of 4:1. It is more common in fat, fertile females in their forties. The composition of gallstones varies considerably but the major components are cholesterol, bile pigments and calcium. Gallstones also include iron, carbohydrates, phosphorous, proteins, cellular debris, mucous and carbohydrates.

Cholecystitis is defined as either an acute or a chronic inflammation of the gall bladder.

The main cause involves cholelithiasis and blockage of the cystic duct due to gall bladder stone migration. This leads to inspissations of bile, bile stasis and secondary infection by gut organisms, predominantly E. coli, S. typhi and Bacteroides species.During investigation of a case of cholecystitis, it is often found that there is significant alteration of liver functions which produces symptomatic and sometimes asymptomatic biochemical changes. It is also a fact that in post cholecystectomy patients, liver functions are regained which can be estimated by examination of liver function tests.

Symptomatically the patient is also relieved of many complaints experienced before operation. The incidences of complications owing to gall bladder stones are also reduced.

For the last 150 years, morbidity and mortality for surgical procedures have long been accepted as part and parcel of the therapeutic process. From the late 1980s, however, it has become evident that less invasive interventional methods have reduced morbidity rates.

The concept of minimally invasive surgery aims to “minimize the trauma of any interventions process but still achieve a satisfactory therapeutic result”. The key feature of minimal access surgery is that it produces significantly less trauma than conventional open procedures [1].

Minimally invasive surgery has rapidly evolved as a major specialty since laparoscopic cholecystectomy was first performed in March, 1987 in Lyon, France.

Laparoscopic cholecystectomy has certainly revolutionised general surgery and in a very short span time has become the gold standard in gall bladder surgery. Born in secrecy and developed under an atmosphere of scepticism and hostility, laparoscopic cholecystectomy triumphed and was quickly accepted [2]

The widespread acceptance of this technique had been largely propelled by public awareness that laparoscopic cholecystectomy is associated with less pain, quicker return to normal activities and better cosmetic results. Previously it was applied to only young, healthy patient. However with growing surgical expertise and continuing improvements in technology, laparoscopic cholecystectomy is being performed on a much broader patient population like in elderly patients with multiple co morbid conditions, the very young, morbidly obese as well as on pregnant women.[3]

A) Assessment of hepatic status in pre- operative patients in comparison with postoperative patients.
B) Comparative evaluations of derangement of hepatic parameters in the preoperative period of patient undergoing different forms of gallbladder operations (conventional or laparoscopic cholecystectomy).
C) To evaluate the usual time required for return of deranged hepatic function, if any, to normal levels.
D) To analyse the outcome of cholecystectomies in patients with symptomatic cholelithiasis for improvement in the preoperative symptoms.

MATERIALS AND METHODS

The study was conducted in a series of 60 cases of chronic calculus cholecystitis.

Patients were selected from surgical outpatient Department of

Darbhanga Medical College and Hospital. Laheriasarai. The tenure of study was from April 2019 to December 2020.

A detailed clinical history was taken from every patient to ascertain the diagnosis of chronic calculus cholecystitis.

Particular features noted were:

- Type of pain - character, site, radiation, duration, relation with food and aggravating/ relieving factors.
- H/O jaundice and itching
- H/O Fever with chill and rigor (cholangitis)

Clinical examination was done – general survey, local and systemic examination to confirm chronic calculus cholecystitis and to exclude other possibilities. After clinically confirming the case, investigations were carried out (imaging and blood tests).

Ultrasonography of whole abdomen was done to confirm the diagnosis. It demonstrated presence of calculi in the gall bladder, size of gall bladder, peri-cholecystic inflammation, thickness of the wall, width of the common bile duct and if any stone /sludge was present in it. It is also informative regarding the condition of liver (i.e. echogenicity and intrahepatic biliary radicals) and both kidneys (i.e. echogenicity etc).

Routine blood tests were conducted (e.g. Haemoglobin percentage, total count and differential count of WBC, ESR and Blood sugar).

Liver function tests (serum bilirubin, AST, ALT and albumin) were done for all cases to exclude any liver disorder or CBD obstruction.

Renal function tests (routine urine examination, serum urea and creatinine, creatinine clearance) were done in all patients to exclude any renal compromise.

EXCLUSION CRITERIA

1. Individuals in which other pre existing disease states dominate or the presence of which may adversely affect the outcome have been excluded.
2. Medically unfit patients with co-morbid conditions.
3. Suspected cases of Carcinoma gall bladder
4. Patients with any preoperative abnormal liver function test or preoperative history of jaundice.
5. Patients with bilioenteric fistula and those who developed major complications after cholecystectomy, requiring prolonged hospitalisation, such as biliary leak requiring hepatic jejunostomy, pancreatitis and major collections requiring laparotomy were also excluded from the study.

RESULTS AND ANALYSIS

In our present study the highest incidence was found to be between the ages of 31 to 40 years. In our present study, youngest was recorded as 10 yrs old and oldest recorded was 65 yrs old. In the present study the disease is predominant in females, out of 60 cases, 48 were females and 12 were males. Out of 60 cases, 58 patients presented with pain abdomen. The pain was severe or colicky in nature, sudden onset, starts in the upper abdomen and radiates to the right side of the back of the chest in 88% cases while in the remaining cases there was radiation to the tip of the right shoulder (6%) or to the anterior aspect of the chest (6%). Pain aggravates on taking fatty food and persisted for 8 to 10 hours and relieved on its own after taking medication. Acute cholecystitis usually occurs with right upper pain and tenderness. The abdominal pain increases with time. The site of pain is usually the right subcostal region although the pain may begin in the epigastrium or the left quadrant then shift to the right subcostal region to the area of the gall bladder inflammation. Referred pain to the right shoulder or to the interscapular region may be experienced approximately 70% of patients have had previous attacks of similar pain that had spontaneously resolved in the past.

We showed that the present findings corroborated with that of the other research groups. Out of 60 cases, 46 cases had history of nausea and vomiting at the time of admission. Anorexia, nausea and vomiting may occur but vomiting is seldom severe. The present findings corroborated with that of the other research groups. Of the 60 cases, 49 cases had history of fullness of abdomen on eating small meals while 21% of patients complained of flatulence and 57% of patients complained of fatty food intolerance. Of the 60 cases, 6cases presented with fever at the time of admission. On examination fever was mild to moderate degree ranging upto 101˚F. Fever was usually associated with chills but without rigor. During a fever the temperature seldom shoots over 101˚F. Chills are unusual and their presence suggests a complicated cholecystitis (abscess associated cholangitis). The main finding was tenderness in the right hypochondrium. Muscle guarding was present in many cases it was localised mainly in the right hypochondrium. A palpable lump was present in 20 cases. The lump was localised in the right hypochondrium extending to the epigastrium or right lumbar region in some cases. The lump was tender and moves with respiration. Dowdy in 1969 described lump abdomen in 11.7% cases. The present findings corroborated with that of the other research groups.

We found in the present study after laboratory investigations were done, anaemia was detected in 18% cases; leucocytosis was detected in 90% cases, raised eosinophil in 4% cases, and raised ESR in 16% cases and diabetes mellitus in 8% cases. Out of 60 patients 58 patients had abdomen pain which was either colicky or nagging in nature. Other symptoms were of variable frequency. After cholecystectomy 40 patients came for follow at one month interval. 96.51 % of patients had complete relief of abdomen pain by the end of one month. Vomiting persisted in 1.49% patients. Some patients, however, continued to experience nausea in the post- op period (17.91% at one month compared to 70% in the preoperative period). Fatty food intolerance stayed at 7.46% at one month follow up. De novo appearance of symptoms was noted in a few patients ranging from dyspepsia (2.99%), flatulence (2.99%), fatty food intolerance (1.49%) and heartburn (1.49%). Most of the patients were satisfied with the symptomatic outcome of the operation.

DISCUSSION

In our study conducted on a random basis over 60 patients who were admitted for cholecystectomy in the department of General Surgery, Darbhanga Medical College and Hospital, Laheriasarai, there is increased incidence of the disease in the age group of 31 – 40 years (40%) and 41 – 50 years (26%). This finding is almost consistent with the figures arrived at by Bateson, [4] in a study conducted by him.

Bateson, [4] have arrived at a female: male ratio which varies between 3:1 to 5:1. In a study conducted the ratio was 4:1 (female: male). In our study which covered 60 patients there were 48 females and 12 males, thus arriving at F: M ratio of 4:1

Andrei VE et al [5] conducted a study in 1998 showed elevation of bilirubin in about 5% cases in open cholecystectomy and 9% in laparoscopic cholecystectomy (LC). In our study elevation of bilirubin was about 16% in conventional cholecystectomy (CC), but in laparoscopic cholecystectomy it was about 36% (amongst them 24% was within normal range and 12% was more than the normal range) and 20% (amongst them 14% was within normal range are 6% more than the normal range) at deflation and on the second postoperative day, respectively.

Halevy et al [6] conducted a study in 1994, revealed elevation of AST in 73% patients in laparoscopic cholecystectomy. In our study it was about 80% (14% within normal range and 66% more than the normal range) at deflation and 84% (20% within normal range and 64% more than the normal range) on the 2nd postoperative day in comparison to 20% - 40% in CC respectively.

The above study also showed 82% increase in ALT level. In our study ALT was increased in 60 % patients (6% within normal range and 54% more than the normal range) at deflation and 70% patients (4% within normal range and 66% more than the normal range) on the second postoperative day in LC. In MC and CC it was about 16-32% and 32-40% respectively during the same period.

Alkaline phosphatase had increased in our study in about 10% of patients in LC, 8% and 0% in CC. Andrei VE et al in [5] 1998 showed 4% and 0% in laparoscopic and open cholecystectomy respectively.

In patients who had abnormal liver function tests, were subjected to repeat measurements of the same on seventh postoperative day. In all cases abnormal values had returned to baseline values.

Serum albumin level was always within normal range in LC and CC.

Around 12% percent patients had de novo development of one or more new symptoms. Analysis of symptom specificity has demonstrated that

colicky pain in the right upper quadrant (biliary colic) associated with gallstones is completely relieved by cholecystectomy. Similarly, nausea, vomiting and heartburn are symptoms related to gall stones and are mostly relieved by removal of gall bladder. Our study found similar results. The resolution of heartburn after cholecystectomy is significant as this suggests that the symptom usually attributed to gastro-oesophageal reflux can be a manifestation of gallstone disease.

Several studies have reported that dyspepsia and fatty food intolerance are only partly relieved by cholecystectomy, raising doubts whether they are directly related to the gallstones. In the present study, we found that the fatty food intolerance was markedly improved after surgery. However, dyspepsia still persisted in 37.31% of patients at 1 month of follow-up and 2 patients (2.99%) developed this symptom de novo in the postoperative period. Removal of gallbladder is associated with several physiological changes in the upper GIT that may account for the persistence or appearance of new symptoms in these patients after surgery. Cholecysto-sphincter of Oddi reflex,cholecysto-antral reflex and cholecysto-oesophageal reflexes are all disrupted. Similarly, a number of local upper GI hormonal changes occur, leading to gastritis, alkaline duodeno-gastric reflux and gastro-esophageal reflux. These changes form the potential basis of persistence or de novo appearance of symptoms in the post-operative period known as post-cholecystectomy syndrome. Other abdominal symptoms such as flatulence, bloating or back pain were partly relieved in our patients. These are not directly related to gallstone disease. Except one,14 most studies have reported that the long term symptomatic outcome is not influenced by the surgical access used for cholecystectomy. However, chances of reporting adverse outcome are more in patients having developed a complication after surgery.

Showing presenting symptoms of calculous cholecystitis in different series

Series	Littler et al 1952	Colcock and Mc Mannus 1954	Dowdy 1969	Kala et al 1977	Ali Nawaz Khan 2008	Present Study
Pain Abdomen (%)	70	87.3	89	97	70	98
Nausea and vomiting (%)	58	48.7	50	84	-	77
Dyspepsia (%)	56	-	-	-	-	83
Fatty food intolerance (%)	-	-	-	-	-	57
Flatulene (%)	-	-	-	-	-	21
Back pain (%)	-	-	-	-	-	6
Heartburn (%)	-	-	-	-	-	25
Fever (%)	-	12.1	19.5	10	-	11

Showing the laboratory finding

Laboratory	Parameters	Percentage
Hb%	Normal Low	82 18
TC	Normal Elevated	10 90
DLC	Normal Raised Eosinophil	96 4
ESR	Normal Raised	84 16
BT,CT	Normal Prolonged	100 0
Serum Cholesterol	Normal Raised	80 20
RBS	Normal Raised	92 8
Serum Creatinine	Normal Raised	100 0
PT	Normal Prolonged	100 0

Comparison of preoperative and postoperative symptoms

Symptoms	Pre-op (%)	1 month post-op (%)	De Novo (%)
Abdomen pain	98	1.49	0
Nausea	70	17.91	1.49
Vomiting	25	1.49	0
Dyspepsia	83	37.31	2.99
Fatty food intolerance	57	7.46	1.49
Flatulence	21	16.41	2.99
Back pain	6	1.49	1.49
Heartburn	25	8.96	1.49

CONCLUSION

A series of 60 patients with chronic calculus cholecystitis underwent cholecystectomy during the period of April 2019 to December 2020 in the department of surgery Darbhanga Medical College and Hospital, Laheriasarai.

The most susceptible age group was 31 – 50 years and female to male ratio was 4: 1. Liver function tests were done in the perioperative period (at deflation and on the second postoperative day) in all patients. Serum bilirubin, AST and ALT levels were raised significantly in laparoscopic cholecystectomy in comparison to conventional cholecystectomy from preoperative normal level. Level of serum alkaline phosphatase elevation was relatively less. All the deranged parameters normalized within seven days after operation.

1) There occurred significant unexplained disturbance in liver function in laparoscopic cholecystectomy. It is suggested that the reason for these phenomenon is the pneumoperitoneum related intra-abdominal hypertension, the only variable that is not large study group is necessary to obtain more statistically significant result. A comparative study using laparoscopy without gas would further be a pointer to pneumoperitoneum being the cause for alteration of liver function. The duration and level of intra-abdominal pressure are responsible for changes of hepatic function during laparoscopic procedures. Although no symptom appeared in patients with normal hepatic and renal function, intra-abdominal pressure should be set at the lowest possible limit and insufflations time should be kept as short as possible in hepatic or renal compromised individual. The patients with severe hepatic or renal failure should probably not be subjected to prolonged laparoscopic procedures.
2) Cholecystectomy appears to relieve most of the symptoms of gall stone disease. Biliary pain, nausea, vomiting and fatty food intolerance had better outcome compared to dyspepsia, flatulence and heart burn. Some patients tend to develop de novo symptoms in the post-operative period. Despite the persistence or appearance of new symptoms, most of the patients feel satisfied with the outcome of surgery.

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