



A Clinico - Sonological and Pathological Study of Gall Bladder Diseases

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Abstract

Background: *The type of study was observational prospective in nature. Adults of both sexes who were referred for abdominal USG with a clinical diagnosis of gall bladder pathology were included in the study. A total of 50 patients with clinical evidence of gall bladder diseases were included in the study.*

Conclusion: *The use of ultrasound is rapid taking only few minutes, easy to perform and interpret, cost effective with good repeatability and reliability, is noninvasive and non-ionizing, the features which help the ultrasound to score over other imaging modalities in emergency situations such as those that arise with gallstones. The overall good sensitivity, specificity and accuracy of ultrasound diagnosis in the Gallbladder diseases in our study has lent support once again to the proposition that Ultrasound is the diagnostic technique of choice in the evaluation of the Gallbladder diseases.*

Study Design: *Hospital based, prospective observational study.*

Keywords: *Cholecystitis, Sonography, Radiograph, CT, Adenomyomatosis.*

Introduction

Approximately 5,00,000 cholecystectomies are done in USA every year at the cost of 3.5 billion per year, and about 50,000 cholecystectomies are done in UK. Gallstones are the most common indication for abdominal surgery and the 4th most common cause of surgical hospitalization in adults.

With every passing day, copious researches are being undertaken to provide for the efficacious evaluation of diagnostic and management strategies. Still the medical fraternity around the world has not come to terms with the epidemiology, etiology, diagnostic factors etc.

Gallbladder pathologies include a host of conditions which are seen, almost every day in radiology practice, the identification of which helps in bringing down the morbidity and mortality associated with them.

The radiological evaluation of Gallbladder diseases have undergone an ocean of change with advent of ultrasound in the mid 1970's. What was the golden standard in yesteryears (OCG) is no more a commonly available option due to the better appreciation of Gallbladder disease by ultrasound.

Ultrasound techniques on the other hand have found greater acceptance by every faculty overwhelmingly throughout the world with its remarkable ratios of

sensitivity and specificity for nearly the entire spectrum of Gallbladder disease. Several studies using ultrasound have led to revisions in clinical approaches to the diagnosis and treatment of Gallbladder diseases and this dissertation of Clinico-Radiological and Pathological Evaluation appears timely.

Material & Methods

The type of study was observational prospective in nature. Adults of both sexes who were referred for abdominal USG with a clinical diagnosis of gall bladder pathology were included in the study.

A total of 50 patients with clinical evidence of gall bladder diseases were included in the study.

Written informed consent was obtained from the patients Sonographic examination was done.

Ultrasound was done using Voluson GE Logic 730 PRO ultrasound machine & Philips HD7 equipment. The patients who had positive findings with regards to any gall bladder pathology were followed up through their surgery up to histopathological result. All the above 50 patients included in the study have undergone USG, surgery and had HPE outcome.

Any patient who has not undergone surgery was excluded. Any patient who underwent surgery but HPE was not available was excluded from study.

Ethical Clearance

The study was approved by the Institutional Medical Ethics Committee.

Data Collection

All data was entered into a Data Collection Performa Sheet which was then entered into Excel [MS Excel 2011]. The Sheet had a visual map for marking and divided into indications for both genders. Other biographical details were also collected including date of birth, weight and height.

Statistical Methods

Descriptive statistical analysis was carried out in the present study. Results on continuous measurements were presented on Mean ± SD [Min-Max] and results on categorical measurements are presented in Number [%]. Significance is assessed at 5 % level

of significance. Chi-square/ Fisher Exact test was used to find the significance of study parameters on categorical scale between two or more groups. Diagnostic statistics viz. Sensitivity, Specificity, PPV, NPV and Accuracy have been computed to find the correlation USG and Biochemical findings

Observation

Table 1. Incidence of Gallbladder diseases with age & sex: (N=50)

SI No.	Age.	Male.	Female.	Total.
1	<19	1	0	1
2	20 -29	0	3	3
3	30-39	2	3	5
4	40 -49	4	10	14
5	50-59	5	8	13
6	60 -69	1	8	9
7	70 -79	1	2	3
8	>80	0	2	2
Total		14 (28%)	36 (72%)	50

Table 2 Incidence of Gallstones with age and sex: (N=50)

SI No.	Age.	Male.	Female.	Total.
1	<19	1	0	1
2	20 -29	0	3	3
3	30-39	1	3	4
4	40 -49	3	8	11
5	50-59	5	8	13
6	60 -69	1	8	9
7	70-79	1	2	3
8	>80	0	2	2
Total		12 (26%)	34 (74%)	46 (92%)

Table 3 Incidence of Gallstones in A.Ch &C.Ch with age and sex: (N=4 5)

SI No.	Age.	Male.		Female.		Total.	
		A.Ch	C.Ch	A.Ch	C.Ch	A.Ch	C.Ch
1	<19	1	0	0	0	1	0
2	20 -29	0	0	1	2	1	2
3	30 -39	0	0	2	1	2	1
4	40 -49	0	3	1	7	1	10
5	50 -59	0	5	2	6	3	10
6	60 -69	0	1	2	6	2	7
7	70 -79	0	1	1	1	1	2
8	>80	0	0	0	2	-	2
Total		1	10	9	25	10	35

Cases, which have been reported as Acute on Chronic cholecystitis by Pathology, have been considered as Acute cholecystitis. The total number of Chronic cholecystitis was 37 among whom 35 cases were associated with Gallstones and 2 cases were not associated with Gallstones. One case of

Gallstone was neither associated with acute or chronic cholecystitis.

Two patients had Gallstones associated with Adenomyomatosis of Gallbladder who also had associated Chronic cholecystitis. One patient was found to have Adenomyomatosis, one to have cholesterolosis and two to have GB carcinoma.

Table 4. Clinical and Radiological Diagnosis in Gallbladder diseases

SI No.	Conditions.	Clinical.	Radiological.	Actual.
1	G.S.	19	45	46
2	A.Ch.	5	9	10
3	C.Ch.	5	27	37
4	Others.	1	4	5

Table 5. Radiological and Pathological Diagnosis of Gallbladder Diseases

SI No.	Conditions.	Radiology.	Pathology.	Actual.
1	G.S.	45	46	46
2	A.Ch.	9	10	10
3	C.Ch	27	37	37
4	CA	2	2	2
5	H.C	2	3	3

Table 6 Plain films and Ultrasound Diagnosis of Gallstones

SI No.	Condition.	P.F.	USG.	Actual.
1.	Stones	7	45	46

Table 7 Ultrasound and CT Diagnosis of Gallbladder diseases

SI No.	Conditions.	USG.	C.T.	Actual.
1	G.S.	2	2	2
2	CA	2	2	2

For the above correlation only cases where both Ultrasound and CT have been done were considered.

Result and Discussion

Gallbladder diseases are very common entities with diverse features of presentation at Clinical, Radiological and pathological settings with variable morbidity and mortality. It implies an altered hepato-biliary function.

Majority of Gallbladder diseases involves Gallstones, which form about 95 % of the all Gallbladder diseases. The non-calculus disease form only about 5% of the cases. Inflammations of Gallbladder, either acute or chronic, are commonly seen in association with calculus Gallbladders.

Benign neoplasms are very rare, whereas malignant neoplasms are more common than benign neoplasms but uncommon compared to inflammatory condition.

In our study we had 46 cases of calculus diseases, and 4 non-calculus cases. Among them 1 had a cholesterol polyp, 1 had chronic cholecystitis with pericholecystic abscess, and other 2 were cases of Carcinomas of Gallbladder.

The hyper plastic cholecystoses were found in 3 cases. 2 cases were associated with stones and the other one was a non-calculus case (cholesterol polyp).

With the advent of Ultrasound, a ocean of change has occurred in the management of Gallbladder diseases.

The Ultrasound criteria used for the diagnosis of the Gallstones were based upon the Ultrasound classification of stones. Type I -stones were seen in 43 cases, Type II in 1 case and Type III in 1 case. One stone was missed on Ultrasound.

The data of the present study are discussed as follows.

Incidence of Gallbladder diseases with age and sex. In our study the Gallbladder diseases were seen in the age group ranging from 15 years to 80 years. Majority of the cases occurred from 40 to 69 years, (72%), with a peak at fourth and fifth decades (54%). From this peak the incidence was found to be decreasing with the both increasing and decreasing age groups. There were 14 (28%) men and 36 (72%) women in a total of 50 cases, with Male : Female ratio of 1 : 2.6.

All the studies on Gallbladder disease prevalence show a steady increase with age (Friedman et.al.,1966, Godfrey et.al., 1966, Bateson & Bouchier et.al.1975 and GREPCO studies, 1988). Studies on the change in biliary lipids with aging suggest that the cholesterol content increases more in post middle ages, which is more marked in women (Trash et.al.1976, Valdivieso et.al. 1978, Fujiyama et.al. 1979).

Normal infants and children have secretion ratios of cholesterol ratios of cholesterol and bile salts that are lower than adults (Heubi et.al. 1982), probably

the reason for low incidence of Gallstones in the pediatric age group.

Our age group with maximum number of cases matches with the observations of Trash et.al. 1976, Valdivieso et.al. 1978 and Fujiyama et.al. 1979, that the disease is common in the post middle age groups.

Friedman et.al. 1966, Bateson & Bouchier 1975, in their series of post mortum prevalence of Gallbladder diseases found that the Gallbladder diseases were more common in women at all ages. Our study once again had more females than males. Since Gallstones form majority of Gallbladder diseases the incidence of them more often closely follows that of the Gallstones.

Incidence of Gallstones with age and sex

The incidence of Gallstones in our study was 92% (46 out of 50). The age group ranged from 15 years to 80 years. The maximum number of cases (33) were seen in from 40 - 69 years (72%), with peak incidence in the fourth and fifth decades (52%).

Gallstones were seen in 26 % (12 out of 46) men and 74% (34 out of 46) with a Male : Female ratio of 1 : 2.8. Michael E Bernardino (1991) observed that the M : F ratio is 1 : 3 below 40 years of age and M : F ratio is 2 : 3 above 40 years of age. In our study the M : F ratio, below 40 years was 1 : 3 and M : F ratio above 40 years was 1 : 2.8.

Men were predominantly affected in their, fourth and fifth decades while women were affected predominantly in the fourth, fifth and sixth decades. None of the women affected were below 20 years and none of the men were affected above 80 years.

The Sirmione study in 1982 involving people from a cross section of entire town (N=1911), found that the Gallstones were present between ages of 18 to 65 years. In GREPCO (1988) the age groups effected were 20 to 64 years (N=2320). Maurer et.al. in 1989 found that Gallstones occurred in the ages ranging from 60 to 74 years. Our results ill-match with these studies. The peak of occurrence in our study was in 5th and 6th decades.

Jorgensen T (1987) concluded that the prevalence rates were higher in the 60's in the both men and women in the ratio of 1:1.7. All the above studies

agree that the incidence of Gallstones increases with the age. However, in our study the number of cases after 70 years were less probably due to the limitation with total number of cases.

The M:F ratios are Sirmione study (1982) - 1:2.5 Bouchier (1969) - 1:2 Maurer et.al. (1989) - 1:3.2 Jorgensen (1987) - 1:1.7 Present study (1999) - 1: 2.8 Our ratios match with the Sirmione and Bouchier study.

Incidence of Gallstones in acute and chronic cholecystitis with age and sex Gallstones were associated with 10 cases of acute cholecystitis (22%) and 35 cases of chronic cholecystitis (78%). One case of Gallstone was neither associated with acute or chronic cholecystitis.

Acute cholecystitis in association with Gallstones was seen in one case men and in nine cases in women. The single case of acute cholecystitis in male was seen in a 15 year, old boy. Among the nine cases of acute cholecystitis seen in female six cases were seen in third,

fifth and sixth decades. In both the sexes, 70% of cases of Gallstones associated with acute cholecystitis were seen in third, fifth and sixth decades.

Acute cholecystitis was associated with Gallstones in

Philip W. Ralls et.al.	99% (492/497)
Steven M. Strasberg	98%
Raghavendra et.al.	96% (23/24)
Joel E.Lichtenstein	95%
Faye C.Laing et.al.	94% (17/18)
M.Lavelle Jones	90%
Present study	100% (10/10)

The incidence of Gallstones in acute cholecystitis was 100% which matches with the results of Philip W.Ralls and to the observation by Steven Strasberg. The differences with other series findings is because, we had no cases of acute acalculus cholecystitis.

There were totally 10 cases of chronic cholecystitis in men and 25 cases in women, associated with Gallstones. The distribution of majority (77%) of the cases of chronic cholecystitis, was encountered in fourth, fifth and sixth decades. In men 80% of the cases were in fourth and fifth decades. In women

majority of the cases (76%) were encountered in fourth, fifth and sixth decades.

Begley (1989), Zech et.al. (1991) showed that chronic acalculus cholecystitis occurred in only about 10% : so 90% of the cases are associated with cholelithiasis. Our results were consistent with the results of Faye C.Laing.

Faye C.Laing et.al. 94% (16/17)

Vasilios Raptopoulos 87% (173/199)

Present study 94% (35/37)

R.E.Herman (in Surgery of liver and biliary tract by L.H.Blumgart, volume 1, 2nd edition) observed that gallstones present with acute cholecystitis in 20% and with chronic cholecystitis in 60 to 70% of cases and with others in 10% of cases. Our results showed that gallstones were associated with acute cholecystitis in 21.7% (10/46) and with chronic cholecystitis in chronic cholecystitis in 76% (35/46).

Incidence of Gallstones with other conditions:

A 48 year, old male patient had Gallstone associated with chronic cholecystitis and generalized Adenomyomatosis of Gallbladder (2.2%).

Incidence of other Gallbladder diseases

There were 2 cases of Adenomyomatosis (4%), one generalized type and the other segmental variety.

There was one case of cholesterol Polyps (2%).

There were 2 cases of Gallbladder Carcinomas (4%).

Clinical vs Radiological Diagnosis in Gallbladder diseases

In 46 cases of Gallstones, the clinical suspicion was proved correct in 19 cases while Radiology identified them correctly in 45 cases.

Acute cholecystitis was correctly diagnosed, clinically in 5 cases and by Radiological means in 9 cases, in a total of 10 cases.

Among 37 cases of Chronic cholecystitis, clinical diagnosis was correct in 5 cases and Radiological diagnosis was correct in 27 case.

Among the other 5 cases that include cases of Hyperplastic cholecystoses and malignancies, the diagnosis was correct in one case clinically and in 4 cases Radiologically.

Radiological vs pathological diagnosis in Gallbladder diseases The Radiological diagnosis was correct in 45 cases, among 46 cases of

Gallstones, in 9 out of 10 cases with Acute cholecystitis, in 27 out of 37 cases of chronic cholecystitis, in 2 out of 3 cases of Hyperplastic cholecystoses and in 2 out of 2 cases of Gallbladder Carcinoma. The Pathological diagnosis was correct in all the cases.

Plain films vs Ultrasound in the diagnosis of Gallstones. Plain films detected Gallstones in 7 (15.21%), and Ultrasound detected them in 45 (98%), out of 46 cases.

Ultrasound vs Computed Tomography in the diagnosis of Gallbladder diseases

the cases, which underwent both Ultrasound and Computed Tomography, the diagnosis by both the modalities was correct in identifying the Gallbladder Carcinoma (100%) and in detecting Gallstones (100%). However, both Ultrasound and Computed Tomography did not diagnose a case of, Chronic cholecystitis that was associated with Gallstone.

Evaluation of the Ultrasound

A. Gallstones

In the 50 cases calculi were actually present in 46 cases. Ultrasound correctly diagnosed the presence of calculi in 45 cases (TP) and its absence in 4 cases (TN). In one patient Ultrasound missed a calculus (FN), that was subsequently found at surgery and received by pathology. This particular calculus was misdiagnosed as tumefactive sludge. The criteria for diagnosing calculi were based on the standard Ultrasound descriptions of Gallstones.

In our study, the sensitivity of Ultrasound in detecting the Gallstones was 97.82%, which compares favorably with the studies done by RL.Cooperberg (1980) and Paul C.Hessler (1981). In comparison to rest of the studies we found our sensitivity to be higher.

The specificity in our study was 100% against 97.7% of P.L Cooperberg.

We had an accuracy of 98% for Ultrasound in detecting Gallstones, which is the same that of Donald M.F.McIntosh.

Based on the above figures we found that the diagnostic Ultrasound is particularly well suited to

the demonstration of Gallstones. This had been proved time and again by several studies, including this one.

B. Number of Gallstones

The study of the number of Gallstones detectable by Ultrasound evolved from the need to prove the patient selection criteria for Extra- corporeal shock wave lithotripsy. Although none of our patients underwent lithotripsy, we however, compared our findings with others. In most studies such as those undertaken by Sackman (1988) and Burhenne H.J. (1988). The maximum numbers accepted for lithotripsy ranged from 3 - 6. This criteria coupled with the inability of Ultrasound to detect the number of stones, due to either sheer number (when >30 or 50) or the proximal stones, causing a dense shadow thus, masking the distal stones (in type II stones) and other factors that, hinder the counting of correct number of stones (such as very small Gallbladders and stones), led to

studies, in determining the countable the number of stones. Our criteria, was to report the stones as multiple if there were more than 4 on Ultrasound and only those cases where the stones were equal to or less than 4 were considered for statistical purposes. John R.Mathieson, in their study excluded patients with stones ranging from 5 and above. We had 12 TP, 3 TN, 1 FP, and 6 FN cases. Our sensitivity was 66.66%, which is superior, to 61% (for 1 and 2 stone families) with James A. Brink et al (1989) and to 60% with John R. Mathieson et al (1989). In our study, specificity was, 75%, accuracy was 68.18%. Our data and that of the reference studies goes to prove that the Ultrasound is not as sensitive in detecting the number of stones as in detecting the stones themselves. Further study, specially designed would be required to determine the maximum number of stones that can be counted accurately.

C. Acute Cholecystitis

Out of 50 patients, 10 (20%) were diagnosed finally as having acute cholecystitis. The pathological criteria for acute disease included the presence of an intense, transmural polymorphonuclear infiltration,

as well as areas of hemorrhage and necrosis, either by itself or in the background of changes akin to chronic cholecystitis (acute on chronic cholecystitis). Ultrasonographically the diagnosis was correctly made in 9 patients (TP). One case (FP) was diagnosed as acute cholecystitis, which turned out to be chronic cholecystitis on pathology. There was one false negative diagnosis.

Statistically we had a sensitivity of 90%, specificity of 50%, accuracy of 83.33%, PPV of 90% and NPV of 50%. Stuart E.Mirvis et al (1986) had a sensitivity of 92%, specificity of 96%, PPV of 92% and NPV of 92%. Faye C. Laing in their study had sensitivity of 94%, specificity of 85% and accuracy of 88%. Our study compares slightly lower to the overall isitivities of other studies. Our accuracy of 83.33% however, mpares well with one and is lower to the other. The differences in our study are probably due to the timing of the surgery done in these patients with which we had no hold.

Calculi were accurately diagnosed in all the 10 cases in this group. The sensitivity and accuracy for diagnosing calculi in cases of acute cholecystitis was 100%, which is superior to those, by Faye C.Laing (sensitivity of 83%, accuracy of 91 %) and Raghavendra et al (sensitivity of 96%) and Philip W.Ralls et al (sensitivity of 99%). Analysis of our data using single signs shows that the presence of stones as shown by Ultrasound is quite accurate in diagnosing acute cholecystitis.

Using the presence of Sludge, to diagnose to acute cholecystitis, our sensitivity of 60% is almost same as that of Faye C.Laing.

Thickened wall of Gallbladder was observed in 8 out of 10 patients giving a sensitivity of 80% which is superior to 72% by Faye C. Laing and to 45% by Sanders R.C. However, it is inferior to 100%, by Raghavendra et al and to 93%, by Engel et al and to 92%, by Philip Ralls et al. Wall edema was identified in 8 out of 10 patients (sensitivity of 80%), which was superior to 70.83% by Raghavendra et al (1981), and was inferior to 88.23% by Jae Hoon Lim et al (1987).

However, we concur with Raghavendra et al (1981) in concluding that both of our data have failed to

show a correlation between pathological severity of the inflammatory process and the degree of wall thickening and anechoic wall. Probably the blood vessel congestion, mucosal edema and hemorrhage that are found on pathology might also have been due to handling the Gallbladder during surgery.

D. Chronic Cholecystitis

Among 50 patients, we had chronic cholecystitis in 37 cases (74%), which was based on the observation of chronic inflammatory cells with frequent association with Rokitansky-Aschoff sinuses, granulomas and thickening of the Gallbladder wall. Ultrasonographically this diagnosis was correctly made in 27 cases. The 10 cases of errors that were made using ultrasound consisted of 1 case which was diagnosed as acute cholecystitis, and failure to recognize the associated chronic cholecystitis in 2 cases of Hyperplastic cholecystoses, probably due to the excitement of having diagnosed one such. Rest of the 7 cases, were diagnosed as just having Gallstones.

For the sonographic diagnosis of chronic cholecystitis we had overall sensitivity of 73%, specificity of 100%, accuracy of 73.68%. Our sensitivity was far superior to 61.5% of Vassilios Raptopoulos et al (1986) and was only slightly superior to 71% of Faye C. Laing (1981). However our accuracy of 73.68% suffered in front of the 88% by Faye

C Laing (1981), which may be due to more number of false negative cases in our study.

The features taking into consideration on ultrasound to distinguish from acute to chronic disease was the absence of focal tenderness over the Gallbladder in the latter group, contracted nature of the Gallbladder, multiplicity of gallstones with obstruction of cystic duct, wall thickening, any pericholecystic collection etc.

Gallstones were correctly diagnosed in 34 cases (TP) in whom they were present. Two cases (TN), which did not have Gallstone, were also diagnosed correctly by ultrasound. In one case however, ultrasound failed to detect a stone (FN).

The sensitivity and specificity for diagnosing gallstones in chronic cholecystitis by ultrasound in

our study were 97% and 100% respectively with an accuracy of 97.36%. This result shows that the presence of gallstone is a good indicator of the correct diagnosis. Faye C.Laing et.al. (1981) have shown the sensitivity to be 94% in their study. Vassilios Raptopoulos in their study found their sensitivity in detecting gallstones to be 87%.

Sludge was present in 5 cases (13.51%), in a total of 37 cases. Faye C.Laing (1981) found it to be present in 12% of his cases.

Wall thickening was seen in 26 of 37 cases in our study, for a sensitivity of 70.27%. The sensitivity in the study by Faye C.Laing was 53%. However a study done by Sanders (1980) found it to be only 10%. In the diagnosis of chronic cholecystitis except for the presence of gallstones, the rest of the considerations like sludge and wall thickening were not sensitive enough, to become single sensitive criteria. However when all the findings are taken into consideration along with the dimension of Gallbladder, the sensitivity should be high.

E. Hyperplastic Cholecystoses

There were 3 cases of hyperplastic cholecystoses (2 cases of adenomyomatosis and 1 case of cholesterol polyps), out of 50 cases. Ultrasound correctly detected 2 cases. Two cases were associated with gallstones and all the cases were associated with chronic cholecystitis. The M : F ratio was 2:1 with age incidence ranging from 27 to 48 years. Our sensitivity of detecting these conditions was 66.66% with an accuracy of 98%. Raghavendra et al (1983) had a sensitivity of 83%, with two of their cases associated with Gallstones. The age range of incidence in their study was 29 to 51, with a M : F of 2 : 4. In a study by R.C Fowler et al (1988) ultrasound detected all the cases for an accuracy and sensitivity of 100%. The association with Gallstones was not found in any of their cases and their cases presented within the age group of 27 to 56. Our sensitivity of 66.66% is low because of the less number of cases within our study. Moreover our study included all the Gallbladder pathologies. However our accuracy was very much comparable to the rest of the studies.

F. Carcinoma

There were 2 cases (4%) of Gallbladder carcinoma in our study with M : F ratio of 1 : 1, in the age group ranging from 40 to 47 years. Gallstones Were not associated with any of them. All the statistical parameters calculated were 100% for the diagnosis by ultrasound in our study.

In a Clinico-pathology study by amaguchi et al (1988) the age range was from 36 to 91 years, M • F was 1 : 4 and about 62% of cases were associated with Gallstones. Joel E Lichtenstein (1991) observes that the condition is common in the 7 decade with M : F ratio of 1 : 3 to 5. The incidence of Gallstones according to him is in the range of 70 to 90%. Ultrasound allowed correct diagnosis of carcinoma in 70 to 82% of cases in the studies done by Yeh H.C (1979) and Dalla Palma et al (1980). Yoshiaki Tsuchiya (1991) found that the sensitivity of ultrasound was 61% in detecting intraluminal protruding (fungating) lesions. About 59%, in all his cases were not associated with Gallstones. Interesting to note however is that none of the pedunculated type of tumors in his study were associated with Gallstones. One of our cases was associated with Choledochal cyst. Literatures say that 25% of choledochal cyst are associated with biliary malignancy.

Statistical Evaluation of plain film Diagnosis in Gallstones

In our study the plain films were obtained either before the ultrasound screening or were done after that. In about 7 cases (TP) the plain films showed the evidence of Gallstones. When plain films were negative for Gallstones, they were so in 4 cases (TN). It was unable to show the presence of calculi in 39 cases (FN). The percentage of calculi that were visible on plain films was 15.21%. The PPV and specificity were 100%. Mary Ann Turner (1991) and P.L.Cooperberg (1987) agree that, about 15% of Gallstones are radio-opaque since that depends on the amount of calcium present.

Statistical Evaluation of Diagnostic Computed Tomography in Gallbladder Diseases

Computed Tomography was underutilized in our study due to various reasons. It was done in 2 cases

of Gallbladder carcinoma and in one case of cholecystitis. The sensitivity of Computed Tomography in detecting Gallstones and Carcinoma was 100%, whereas 1 case of cholecystitis was missed since morphologically the Gallbladder appeared normal while associated with Gallstone. In another case of Gallstone the associated cholecystitis was correctly diagnosed. Since our utilization of Computed Tomography was low our figures may be too high.

Summary and Conclusion

Gallbladder diseases are very common and it is appropriate to emphasize that knowledge of these diseases is imperative. In the present study of 50 patients an attempt was made to correlate the clinical, radiological and pathological features of Gallbladder diseases and to ascertain the sensitivity and specificity of ultrasound in the evaluation of Gallbladder diseases.

The radiological diagnosis in Gallbladder diseases had favorable results against the clinical diagnosis and had also been shown to be impressive against the pathological diagnosis. In our study the radiological diagnosis of Gallbladder diseases with reference to most of the disease conditions, except chronic cholecystitis was only just inferior to the sonological diagnosis and was superior to the clinical diagnosis in all the diagnosis. We agree with Faye C.Laing et.al. in realizing the difficulties that occur in distinguishing chronic cholecystitis on the sonography.

Among the radiological modalities utilized Ultrasonography and Computed Tomography (although underutilized in our study) were found to give good yields result wise.

Ultrasound could detect gallstones and acute cholecystitis more often unfaillingly. Other conditions such as chronic cholecystitis, adenomyomatosis, cholesterol polyp, carcinoma etc. were also diagnosed.

The use of ultrasound is rapid taking only few minutes, easy to perform and interpret, cost effective with good repeatability and reliability, is noninvasive and non-ionizing, the features which

help the ultrasound to score over other imaging modalities in emergency situations such as those that arise with gallstones.

The overall good sensitivity, specificity and accuracy of ultrasound diagnosis in the Gallbladder diseases in our study has lent support once again to the proposition that Ultrasound is the diagnostic technique of choice in the evaluation of the Gallbladder diseases.

Acknowledgement

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