

Ultrasonographic Study Of Correlation Between Development Of Gallstones With Morphology Of Gallbladder And Common Bile Duct In North Indian Population

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Abstracts: Background & objectives- Gallbladder diseases are very common in Indian population. Ultrasonography (USG) is the commonest mode of investigation in such conditions .In view of above mentioned points we have conducted the present study on ultrasonographic findings of gallstone (GS) patients . Present study aims at determining the comparative prevalence of single and multiple gallstones and size of gallbladder(GB) and common bile duct (CBD) in patients . In present study we have also tried to find relationship of development of gallstones with age and sex of the patient . Methods- For the purpose of study we have divided patients into seven groups(groups A-G) according to age . In each group we have calculated mean gallbladder size and mean common bile duct diameter with the help of ultrasonographs . Then we will calculate percentage of patients ,patients with multiple stones, patients with single stones , mean gallbladder size and mean gallbladder diameter in each age group. Results- Gallstones patients are more of 25-50 years of age and females are more susceptible according to present study . There were more cases of multiple stones . Mean gallbladder length in all age groups is found to be less than normal. Interpretation & conclusion- Present study suggests increased incidence of gallstones in young population and it underlines the importance of ultrasound in screening gallbladder diseases. [Usman N et al NJIRM 2012; 3(2) : 41-44]

Key words: gallbladder , gallstone , ultrasound

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Introduction: A gallstone is a concretion in gallbladder ,common bile duct (CBD) or cystic duct. They are more common in females and their incidence increases with age. Hepatopancreatic ampulla is the commonest site of impaction of GS. Next commonest site is Hartmann`s pouch. USG is commonest non-invasive technique for locating gallstones.¹

Radioanatomy as a subdiscipline of human anatomy is gaining significance day by day due to its direct application in clinical specialities. Normal GB is 10cm long and normal length of CBD is 5-15 cm. Significance of present study lies in the fact that here we are determining whether lengths of pathological GB and CBD vary from normal or not with the help of USG.

In past also USG is used in many GB related studies . Through USG it has been shown that moderate and periodic alcohol intake did not stimulate rapid postprandial GB emptying ². Nurullah³ et al had shown that ultrasonography

is highly sensitive modality in the diagnosis of gallbladder malignancy. Studies have shown that cholecystomegaly and greater incidence of gallstones is significantly correlated with diabetes^{4 5}. USG-findings were used in grading GB-diseases⁶.

Extrahepatic billiary apparatus is associated with many anomalies. Cases related with aberrant GB and agenesis of GB have been reported.^{7 8}

This study is conducted with the objectives to determine if size of gallbladder has any relation with size of gallstones, to find which type of gallstones (single or multiple) are more common in cases under study and to find out age group which is most susceptible for cholilithiasis. In present study we expect to find more female patients among the studied cases. Through this study we hope to determine an age group which is most at risk of developing gallstones. We also expect to find significant correlation between size of GB with presence of GS . Our present study will certainly help in emphasizing

the need and importance of USG in diagnosis of anomalies and other clinical conditions as well as in better understanding of morphology of various viscera.

Material and Methods : Process: For the present study we got USG films of patients from Mittal diagnostic and research centre Ramghat Road Aligarh.

Following information was collected from patients diagnosed with cholelithiasis. 1. age and 2. sex of the patient. We had taken prior consent from patients to use their ultrasonographic findings for our study. Moreover we had included only those patients in study who were advised ultrasound by their consultants. Following features were observed in each USG and noted down

- length of GB
- diameter of CBD
- whether single or multiple stones are seen.

After recording the above findings we studied following parameters-

1. Correlation between development of gallstones and age of the patient- According to age we divided the patients into following groups

- Group A - upto 10 years
- Group B- 11-20 years
- Group C- 21-30 years
- Group D- 31-40 years
- Group E- 41-50 years
- Group F- 51-60 years
- Group G- > 60 years

Then we tabulated the number of patients in each age group. Hence the age group which is most at the risk of development of GS can be deduced.

2. Relation of development of GS with sex of the patient- Out of the total cases of GS we calculated the percentage of male and female cases. Previously it had been said that the prevalence is more in females .

3. Number of cases with single and those with multiple stones were seen and then we found

which type is more prevalent in which age group.

4. Normal size of GB is 10cm. As we had already classified the cases according to age .

5. Similarly we determined mean CBD diameter in each group.

Result: Out of 108 patients diagnosed with cholelithiasis maximum 36 patients were in age group 21-30 in our study also there were more female patients . Out of 108 cases 20 were males and 88 were females. There was no male patient less than 21 years of age . Number of elderly patients (>50years) was equal in both the sexes. . (See table 1)

Table -1 : Correlation of gallstone disease with age and sex of the patient

S.No	Age-group [in years]	Number of patients with GS	Number of male patients	Number of female patient
A	<10	0	0	0
B	11-20	12	0	12
C	21-30	36	8	28
D	31-40	20	2	18
E	41-50	24	2	22
F	51-60	8	4	4
G	>60	8	4	4

In present study out of 108 patients ultrasonographically diagnosed with gallstone disease 41 were having single stones and 67 cases were of multiple stones. (Table 2)

Table – 2 : Comparison of occurrence of single and multiple gallstones in different age groups

Group	Number of patients with single gallstone	Number of patients with multiple gallstones
A	0	0
B	4	8
C	15	21
D	10	10
E	6	18
F	2	6
G	4	4

Table – 3: Correlation between length of gallbladder in patients having gallstones with age

GROUP	Mean GB length [in cm.]	Maximum length [cm]	Minimum length [cm]
A	-	-	-
B	7.88	15.5	5.3
C	6.49	10.8	4.2
D	7.5	12.4	6.6
E	7.09	11.2	4.9
F	5.55	7.1	4.2
G	8.35	16.5	2.5

Table – 4: Correlation between age group and mean CBD diameter

Age group	Mean CBD diameter [mm]
A	-
B	3.5
C	3
D	3.25
E	3.5
F	3.71
G	3

Discussion: In present study of 108 cases diagnosed with cholelithiasis maximum patients were in age group 21-30. Esmail⁹ et al studied prevalence of gallstones in Iranian population increases with age. Not a single case was less than 35 years .Commonest age –group was between 56-65 years . Percentage of patients with single , double and triple stones is 37.5% ,18.8% and 25% respectively in Iranian population .

Hamid N Khan et al¹⁰ had studied that in a population in South East England gallstone prevalence is 19.1% in males and 29.0% in females . One third of elderly population of both sexes was having gallstones. Wayne et al¹¹ had had shown that prevalence of gallstones in U.K. increases with age . 8% of those of 40 years

and 20% of those of 60 years have gallstones . Prevalence in males is lower than females. Subjects under study were between 15-65 years .

David et al¹² had concluded that aging is an independent risk factor for cholesterol gallstone formation .

Paola et al¹³ studied prevalence of gallbladder disease in Chianciano population in Italy . 5.9% of population was having gallstones. Prevalence in males was 3.7% and in females was 8.4%. Lesser cases were seen under 15-29 years of age in Italian population.

In present study maximum (36) patients were of 21-31 years of age . In age groups D(31-40 years) and E (41-50 years) number of patients reported was 20 and 24 respectively . In present study conducted on 108 patients ages of 80 patients were between 21-50 years ,12 patients were below 21 years , no case less than 12 years was reported and 16 were more than 50 years of age. Our findings were contrary to the findings in other populations where incidence of gallstones has increased with age . Early diagnosis and the fact that only cases of gallstone disease are included in our study may be the reason .

Like other populations in our study also there were more female patients . Out of 108 cases 20 were males and 88 were females. There was no male patient less than 21 years of age . Number of elderly patients (>50years) was equal in both the sexes.

In present study out of 108 patients ultrasonographically diagnosed with gallstone disease 41 were having single stones and 67 cases were of multiple stones. Upto 60 years of age number of patients with multiple stones was more than those of single stones. But after 60 years number of multiple and single gallstone cases was same.

Maximum (16.5 cm) and minimum (2.5 cm) lengths of gallbladder were reported in group G (>60 years) of age. Mean gallbladder length was least (5.55

cm) in group F (51-60 years) and maximum (8.35 cm) in group G. In present study mean gallbladder diameter ranged between 3-3.71 mm .

Conclusion:

1. In present study we have found that females are more at risk of developing gallstones.
2. Young population (21-30years) is getting more susceptible to gallbladder disease.
3. In our study people between 21-50 years were at risk of developing gallstones.
4. Multiple stones were more common in studied cases
5. Gallbladder length in patients under present showed variation from normal(10cm). In few patients GB length was as much as 16.5cm but mean gallbladder length in all age groups was found to be less than normal.
6. Mean common bile duct diameter did not show much variation in different age groups.

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