

A study on changes of liver function test in Choledocholithiasis

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Abstract:

Background: Choledocholithiasis is a plight for the society owing to the significant morbidity associated with the disease. The clinical presentation of choledocholithiasis may be asymptomatic or symptomatic. In the absence of symptoms of choledocholithiasis, the preoperative diagnosis depends on changes serum Liver function test and other imaging studies Ultrasonography can't always diagnosis choledocholithiasis in cases of cholelithiasis. MRCP is costlier and many patients can't afford. Changes in liver function test can predict the presence of choledocholithiasis.

Materials and Methods: Hospital based observational study was conducted in 73 cases of choledocholithiasis who were admitted in the department of General surgery, AMCH, Dibrugarh during the period from June, 2019 to May, 2020. Inclusion criteria was all diagnosed cases of choledocholithiasis and exclusion criteria's were all cases of age less than 12 years, associated with malignancy of extrahepatic or intrahepatic biliary tree, associated with alcoholic chronic liver disease. The data of value of different parameter of liver function test were noted. All recorded data were compiled, categorized and tabulated in terms of frequency, percentages and mean \pm standard deviation and analyzed.

Results: The percentage of cases with raised total bilirubin, conjugated bilirubin, alkaline phosphatase, AST, ALT, γ -GGT are 83.56%, 80.82%, 71.23%, 67.12%, 65.75%, 82.19%, 80.82% respectively.

Conclusion: Altered liver enzymes and bilirubin level can predict and help in and diagnosing choledocholithiasis.

Key Word: Alkaline phosphatase, Gamma- glutamyl transferase, Choledocholithiasis, Liver function test

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I. Introduction

Choledocholithiasis or common bile duct stone (CBDS) is associated with 10-18% of the cases who undergo cholecystectomy.¹ approximately 1-2% of the cholecystectomy case is associated with retained CBDS.² In the absence of symptoms of CBDS, the preoperative diagnosis of CBDS is depends of serum Liver function test and other imaging studies.² Liver function test (LFT) can predict the presence of choledocholithiasis. Most commonly used laboratory parameters are serum bilirubin and alkaline phosphatase and Gamma-glutamyltransferase (GGT). Raised GGT level is the most sensitive and specific indicator of CBDS. The value of GGT more than 90IU/L has sensitivity and specificity of 86% and 74.5% respectively.²

II. Material And Methods

This hospital based observational study was conducted in the Department of General Surgery in Assam Medical College and Hospital for a period of one year from June, 2019 to May 2020.

Study Design: Hospital based observational study

Study Location: Department of General Surgery, Assam Medical College and Hospital, Dibrugarh(India)

Study Duration: June, 2019 to May 2020

Sample size: 73 patients.

Sample size calculation:

All the diagnosed cases of choledocholithiasis radiologically and treated in Assam Medical College and Hospital, Dibrugarh during the study period of one year from June, 2019 to May 2020 and fulfilling the following inclusion and exclusion criteria

Subjects & selection method:

All the diagnosed cases of choledocholithiasis radiologically and treated in Assam Medical College and Hospital, Dibrugarh during the study period of one year from June, 2019 to May 2020 and fulfilling the following inclusion and exclusion criteria

Inclusion criteria:

All diagnosed cases of choledocholithiasis with or without cholelithiasis by radiological investigations

Exclusion criteria:

1. All cases of choledocholithiasis with patient age < 12 years
2. All cases of choledocholithiasis associated with malignancy of extrahepatic or intrahepatic biliary tree diagnosed by radiologically or serologically.
3. All cases of choledocholithiasis with alcoholic chronic liver diseases.

Procedure methodology

After admission in to the hospital, the clinical history and examination of patients were done and data was recorded. Liver function test was done and data of value of different parameter of liver function test was noted.

Statistical analysis

All recorded data were compiled, categorized and tabulated in terms of frequency, percentages and mean ± standard deviation. Also suitable graphical representations of data were made. Analysis was done with the help of Microsoft Excel software.

III. Result

The results and observation of our study are mentioned below using tables and graphical charts.

Table1: Total Bilirubin Level:

Total bilirubin (mg/dl)	Number of cases(n=73)	Percentage
≤1	12	16.44
1 –2	11	15.06
2–4	14	19.18
4–6	14	19.18
6–8	6	8.22
≥8	16	21.92
Mean Bilirubin Level	5.34± 4.82 mg/dl	

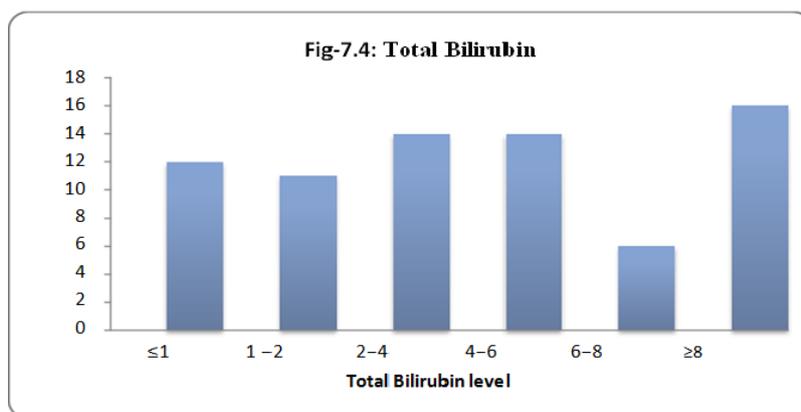


Table-2: Direct Bilirubin (Conjugated Bilirubin)

Direct bilirubin (mg/dl)	Number of cases	Percentage
≤0.3	14	19.18
>0.3	59	80.82

Table-3: Indirect Bilirubin Level:

Indirect bilirubin (mg/dl)	Number of cases	Percentage
0.2-0.9	58	79.45
>0.9	15	20.55

Table-4: Serum Alkaline Phosphatase Level

Alkaline phosphatase (ALP) IU/L	Number of cases	Percentage
40-130	21	28.77
130-250	24	32.88
250-350	9	12.33

350-450	7	9.59
450-550	9	12.33
>550	3	4.11
Mean ALP	247.67± 162.50	

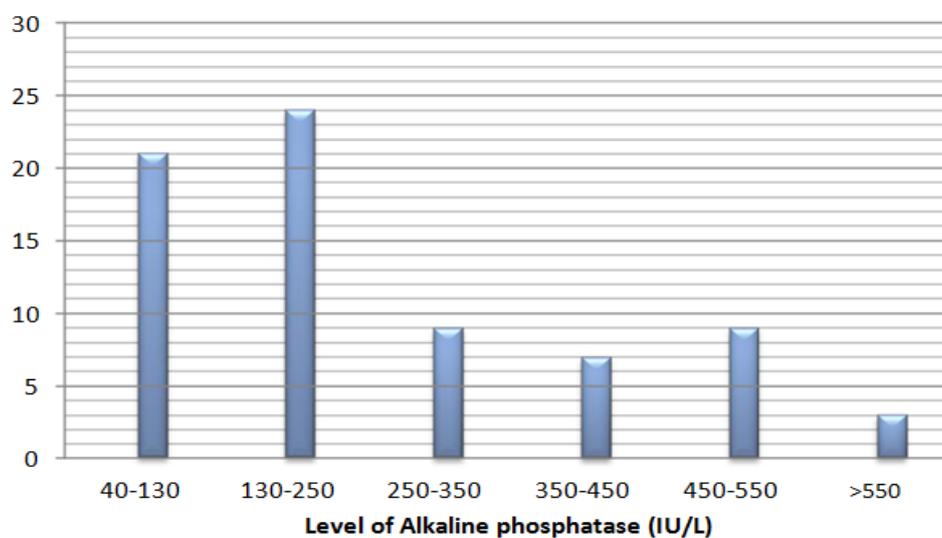


Table-5: Aspartate Transaminase (AST) level:

Aspartate Transaminase (AST in IU/L)	Number of Cases(n=73)	Percentage
10-40	24	32.88
>40	49	67.12
Mean value of AST	95.14± 64.03	

Table-6: Alanine Transaminase (ALT) Level:

Alanine Transaminase (IU/L)	Nos. of cases(n=73)	Percentage
10-40	25	34.25
>40	48	65.75
Mean value of ALT	94.71 ± 64.12	

Table-7: Gamma-Glutamyl Transferase (GGT) Level

GGT(IU/L)	Nos. of cases (n=73)	Percentage
9-58IU	13	17.81
> 58IU	60	82.19
Mean value of GGT	125.16 ±70.46	

Table-8: Serum Albumin Level:

Serum albumin(g/dl)	Nos. of cases(n=73)	Percentage
<3.5	14.00	19.18
3.5-5.5	51.00	69.86
>5.5	8.00	10.96
Mean serum Albumin	4.38 ± 0.95	

Table-9: Serum Globulin Level:

Serum Globulin(g/dl)	Number	Percentage
<2	1	1.37
2-3.5	68	93.15
>3.5	4	5.48
Mean value of serum Globulin level	2.64 ± 0.46	

IV. Discussion

In the present study, 83.56% cases had raised total bilirubin level more than 1mg/dl. Aleknaite *et al*³ (in 2018), Ad. Barlow *et al*³ (in 2013), Ming Hsun Yang *et al*⁴ (in 2008) and An Barkun *et al*⁵ (in 1994) also found increased in total serum bilirubin level in 78%, 69%, 87.5% cases of choledocholithiasis cases respectively in their study.

In the present study, it was found that 71.23% choledocholithiasis cases had raised alkaline phosphatase level. The percentage of cases of raised ALP level in choledocholithiasis cases in various studies by Keun Soo Ahn *et al*⁶ (in 2016), Ad. Barlow *et al*⁷ (in 2013), Ming Hsun Yang *et al*⁴ (in 2008), J C Pereira Lima *et al*⁸ (in 2000) & AN Barkun *et al*⁵ (in 1994) were 71.4%, 62%, 79.5%, 74.7% and 79% respectively.

In the present study, it is found that 67.12% choledocholithiasis cases had raised AST level more than 130 IU/L. The percentage of cases of raised aspartate transaminase level (AST) in choledocholithiasis in various studies by Keun Soo Ahn *et al*³ (in 2016), Ming Hsun Yang *et al*⁴ (in 2008), J C Pereira Lima *et al*⁹ (in 2000) and AN Barkun *et al*⁵ (in 1994) were 74.5%, 63.6%, 50.8% and 81% respectively. The incidence of raised alkaline phosphatase level in the present study is comparable to these various studies.

In the present study, it is found that 65.75% choledocholithiasis cases had raised ALT level which is comparable to other studies by Keun Soo Ahn *et al*³ & Ming Hsun Yang *et al*⁴.

In the present study, it is found that 82.19% choledocholithiasis cases had raised GGT level more than 58IU/L (normal cut off value) which is comparable to other studies by Keun Soo Ahn *et al*¹⁰ and Ming Hsun Yang *et al*⁴.

V. Conclusion

In cases with cholelithiasis if there is altered liver function test (raised in total bilirubin level, raised in AST, ALT, ALP or GGT) and USG of abdomen reveals no calculus in CBD, then further MRCP should be done to rule out biliary obstruction due to calculus or other causes. Raised serum total bilirubin level, raised total ALP and GGT are very good predictor for presence of choledocholithiasis.

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