

CBD Exploration with or without T Tube

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ABSTRACT

Aim: To compare the mean hospital stay in patients of choledocholithiasis with and without T-tube for common bile duct exploration.

Method: We conducted a randomized controlled trial from February 2014 to February 2016.

Results: In our study the mean age of the patients was 50.29 years, 65% patients were females and female to male ratio was 1.85:1, mean hospital stay in group A was 3.16 days and in group B was 11.88 days.

Conclusion: This study has demonstrated that patients of CBD exploration for choledocholithiasis without T tube has shorter hospital stay than patients with T tube.

Keywords: choledocholithiasis, common bile duct, T-tube

INTRODUCTION

Calculous disease of the biliary tract is significant international health problem. The incidence of cholelithiasis in USA is around 10%. The incidence of cholelithiasis varies widely in different parts of world and its incidence is increasing in Pakistan¹.

Prevalence of gallstones is highest in people of northern European descent, and in Hispanic populations and Native American populations². Women are more likely to develop cholesterol gallstones than men, especially during their reproductive years, when the incidence of gallstones in women is 2-3 times that in men.

About 10 to 15 % of patients with cholelithiasis have choledocholithiasis. Common bile duct stones can be classified as primary or secondary on the basis of the site of their origin. Secondary stones are believed to be the cholesterol stones. Primary stones are mostly the pigment stones. Bile duct stones can also be formed in the absence of gallbladder stones, and such primary bile duct stones are more common in East Asian countries than in the Western world³. The secondary bile duct stones have the same etiology as the cholesterol stones but the primary bile duct stones are caused by stasis and bacterial infection.

Investigation for bile duct depends upon symptoms but complete blood count which may show raised white cell count in the presence of infection, cholangitis, and eosinophilia in the presence of parasitic infestation. Liver function test can be normal or shows raised bilirubin. Ultrasonography is the procedure of choice in suspected gallbladder or biliary disease; it is the most sensitive, specific, noninvasive, and inexpensive test for the detection of gallstones. Moreover, it is simple, rapid, and safe in pregnancy, and it does not expose the patient to harmful radiation or intravenous contrast. Common bile duct (CBD) stones are missed frequently on transabdominal ultrasonography (sensitivity, 15-40%). Endoscopic ultrasound (EUS) is also an accurate and relatively noninvasive technique to identify stones in the distal common bile duct. Sensitivity and specificity of CBD stone detection are reported in range of 85-100%⁴. CT scanning is superior to ultrasonography for the demonstration of gallstones in the distal common bile duct. MRCP (magnetic

resonance cholangio pancreaticogram) is also used for cases in which ultrasound is inconclusive with clinical and biochemical suspicion of choledocholithiasis.

The treatment of choledocholithiasis is endoscopic and surgical. ERCP (endoscopic retrograde cholangio pancreaticogram) is endoscopic method of removing common bile duct stones. The surgery for the choledocholithiasis involves removing stones from CBD followed by placing a T-tube in common bile duct which is associated with longer hospital stay of 4.9+/-3.2 days and the choledochotomy with primary closure has lower hospital stay of 3.2 +/-2.1⁵.

There is another study showing no significant difference of hospital stay between two groups with T-tube group 8.8 +/- 4.5 days and without T-tube group 8.4 +/- 3.1 days with P value of >.05⁶. The T-tube is a latex tube shaped like a T, the horizontal limb of T is placed within a tubular structure such as the common bile duct and the vertical limb of T is brought out through the skin. A study carried out in Jinah postgraduate medical Centre Karachi showed the same results⁷. The common bile duct with T-tube is associated with longer hospital stay. The aim of the study is to determine the main hospital stay because controversy exists in available literature as stated above in reference number 5 and 6. Only one study is being done in Pakistan which is mentioned in introduction with inadequate sample size of 20 in each group. So this study is planned to generate confirmatory results that whether surgeons should do common bile duct exploration with or without T-tube.

MATERIALS AND METHODS

We conducted a Randomized controlled trial in the

Department of Surgery, Shaikh Zayed Hospital complex Lahore from February 2014 to February 2016. The sample size of 100 cases, 50 each group is estimated by using 95% of confidence level, 80% power of test with expected mean +/- standard deviation of mean hospital stay of 4.9 +/- 3.2 and 3.2 +/- 2.1 for common bile duct exploration with and without tube respectively.

Inclusion criteria:

1. Patients of both gender.
2. Age from 16 to 70 years
3. Patients with cholelithiasis and choledocholithiasis assessed by transabdominal ultrasound with findings

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of echogenic rounded focus in common bile duct and dilated common bile duct of more than 6 mm plus 1 mm for every decade after 60 years of age.

4. Patients fit for surgery ASA 1 to 3

Exclusion criteria

1. Patients not willing to participate in study.
2. Patients with concomitant biliary tract malignancy.
3. Re-do surgery
4. Not fit for general anesthesia ASA grade more than 3.

RESULTS

In this present study total 100 cases participated. The mean age of the patients. The mean age of patients was 50.29 years with minimum age of 16 and maximum of 70 years (Table 1).

Frequency distribution of gender showed that 64% of patients were female and 36% males. Female to male ratio of 1.8:1 (Table 2, Fig.1)

Group wise distribution of hypertension among patients showed that 36% of patients in each group are hypertensive (Table 2, Fig.2).

Group wise distribution of diabetes mellitus showed that 32% and 36% of patients in group A and B respectively , were diabetics (Table 4, Fig.3).

Group wise distribution of ASA score showed that in group A, 43 were ASA 1 and 7 patients had ASA 2. In group B, 41 patients were ASA 1 and 9 patients were ASA 2 (Table 5, Fig.4).

Mean hospital stay in group was 3.16 +/- 1.094 days and 11.88 +/- 2.38 days in group A and group B respectively with the p-value of <0.0001 (Table 6, Fig.5).

Mean hospital stay in diabetic patients in group A and B was 2.77 +/- 0.66 and 11.9 +/- 1.99 respectively with p-value of <0.0001 (Table 7).

Mean hospital stay in hypertensive patients in group A and B was 2.5 +/- 0.75 and 12.12 +/- 1.55 days respectively with p-value of < 0.0001 (Table 8).

Mean Hospital stay in both groups with regard to gender showed 3.23 +/- 1.03 and 11.52 +/- 3.12 days in group A and B males respectively. Mean hospital stay 3.1 +/- 1.06 and 12.03 +/- 3.4 days was observed in female of group A and B respectively. p-value of <0.0001 (Table 9).

Mean hospital stay in groups with regard to ASA score showed 2.49 +/- 0.49 days and 12.15 +/- 1.55 days observed in ASA 1 patients in group A and B respectively. The mean hospital stay in ASA 2 patients was 2.6 +/- 0.55 days and 12.5 +/- 1.26 days in groups A and B respectively (Table 10).

The mean hospital stay in diabetic patients was 2.77 +/- 0.66 days and 11.9 +/- 1.99 days in group A and group B respectively. the mean hospital stay in non-diabetic patients was 2.8 +/- 0.62 and 11.5 +/- 1.7 days in group A and group B respectively (Table 11).

The mean hospital stay in hypertensive patients of group A and group B was 2.5 +/- 0.75 and 12.12 +/- 1.55 respectively The mean hospital stay in non hypertensive patients was 2.56 +/- 0.85 and 12.22 +/- 1.45 respectively (Table 12).

Table 1: Descriptive statistics of age (years)

Age (years)		Group A	Group B
N	100	50	50
Mean	50.29	51.32	51.06
SD	12.76	10.29	11.70
Minimum	16.00	22	16
Maximum	70.00	69	70

Table 2: Group wise distribution of gender

Gender	Group A	Group B	Total
Male	17(34%)	19(38%)	36
Female	33(66%)	31(64%)	64
Total	50	50	100

Fig. 1: Group wise distribution of gender (n=100)

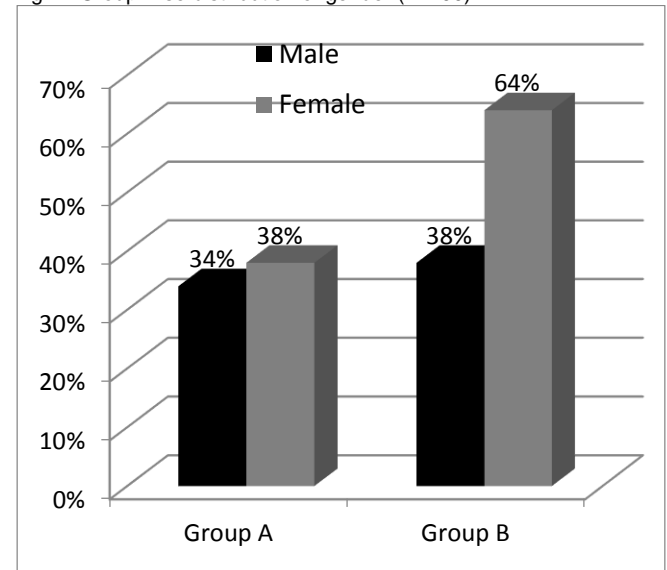


Table 3: Group-wise distribution of HTN

Gender	Group A			Group B			Group C		
	N	HTN	%	N	HTN	%	N	HTN	%
Male	17	3	17.6	19	2	10.5	36	5	13.9
Female	33	5	15.1	31	6	19.4	64	11	17.2
Total	50	8	16	50	8	16	100	16	16

Table 4: Group-wise distribution of DM

Gender	Group A			Group B			Group C		
	N	HTN	%	N	HTN	%	N	HTN	%
Male	17	2	11.7	19	4	21	36	6	16.6
Female	33	6	18.2	31	6	19.3	64	12	18.8
Total	50	8	16	50	10	20	100	18	18

Table 5: Group-wise distribution of ASA

Gender	N	ASA 1	Group A			N	ASA 1	Group B			N	ASA 1	Total		
			%	ASA 2	%			%	ASA 2	%			ASA 2	%	
Male	17	14	82	3	17	19	15	78	4	21	36	29	80	7	19
Female	33	29	87	4	12	31	26	83	5	16	64	55	85	9	16
Total	50					50					100				

Table 6: Results of comparison of mean hospital stay between group A (without T-tube) and Group B (with T tube) and t-test Results

Groups	N	Mean Hospital stay (in days)	95 % CI **
Group A (without T tube)	50	3.16 +/- 1.09470	-9.4549046 to
Group B (with T tube)	50	11.88 +/- 2.37882	-7.9850954

P value < 0.0001, df:98, t test: 23.5467, * CI: Confidence Interval

Table 7: Comparison of mean hospital stay between diabetic patients and t-test Results

Groups	N	Mean hospital stay (in days)	p-value	df*	t-test value	95 % CI **
Group A (without T tube)	50	2.77 +/- 0.66	< 0.0001***	98	30.7923	-9.7184 to -8.5416
Group B (With T tube)	50	11.9 +/- 1.99				

* df: degrees of freedom ** CI: Confidence Interval *** significant value

Table 8: Comparison of mean hospital stay between hypertensive patients in group A and group B and t-test Results

Groups	N	Mean hospital stay (in days)	p-value	df*	t-test value	95 % CI **
Group A (without T tube)	50	2.5 +/- 0.755	< 0.0001***	98	39.4546	-10.10386 to -9.13614
Group B (with T tube)	50	12.12 +/- 1.55				

*df: degrees of freedom, **CI: Confidence interval, *** significant value

Table 9: Stratification of mean hospital stay in both groups with regards to gender and t-test Results

Gender	Group	N	Mean hospital stay (in days)	p-value	df*	t-test value	95 % CI **
Male	Group A	17	3.23 +/-1.03	< 0.0001***	34	10.4442	-9.9031 to -6.6769
	Group B	19	11.52 +/- 3.12				
Female	Group A	33	3.1 +/- 1.06	< 0.0001***	62	14.3693	-10.1723 to -7.6877
	Group B	31	12.03 +/- 3.4				

* df: degrees of freedom ** CI: Confidence Interval *** significant value

Table10: Stratification of mean hospital stay in both groups with regards to ASA status and t-test Results. (N=100)

SA score A	Group	N	Mean hospital stay	p-value	df*	t-test value	95 % CI **
ASA 1	Group A	43	2.49 +/- 0.49	0.4777	34	0.7179	-0.4597 to 0.2197
	Group B	41	12.15 +/-1.55				
ASA 2	Group A	7	2.6 +/- 0.55	0.9359	62	0.0807	-0.2576 to 0.2376
	Group B	9	12.50 +/-1.26				

* df: degrees of freedom ** CI: Confidence Interval

Table 11: Stratification of mean hospital stay in both groups with regards to DM (N=100) and t-test Results

DM	Groups	N	Mean hospital stay (days)	p-value	df*	t-test value	95 % CI **
Yes	Group A	8	2.77 +/- 0.66	< 0.0001***	16	12.3777	-10.6937 to -7.5663
	Group B	10	11.9 +/- 1.99				
No	Group A	42	2.8 +/- 0.62	< 0.0001***	80	31.0749	-9.2572 to -8.1428
	Group B	40	11.5 +/- 1.7				

*df: degrees of freedom ** CI: Confidence Interval *** significant value

Table: 12: Stratification of mean hospital stay in both groups with regards to hypertension-HTN (N=100) and t-test Results

HTN	Groups	N	Mean hospital stay (in days)	p-value	df*	t-test value	95 % CI **
Yes	Group A	8	2.5 +/- 0.75	<0.0001***	14	15.8018	-10.9257 to -8.3143
	Group B	8	12.12 +/- 1.55				
No	Group A	42	2.56 +/- 0.85	<0.0001***	82	37.2471	-10.1759 to -9.1441
	Group B	42	12.22 +/- 1.45				

*df: degrees of freedom ** CI: Confidence Interval *** significant value

Fig. 2: Group wise distribution of Htn (n=100)

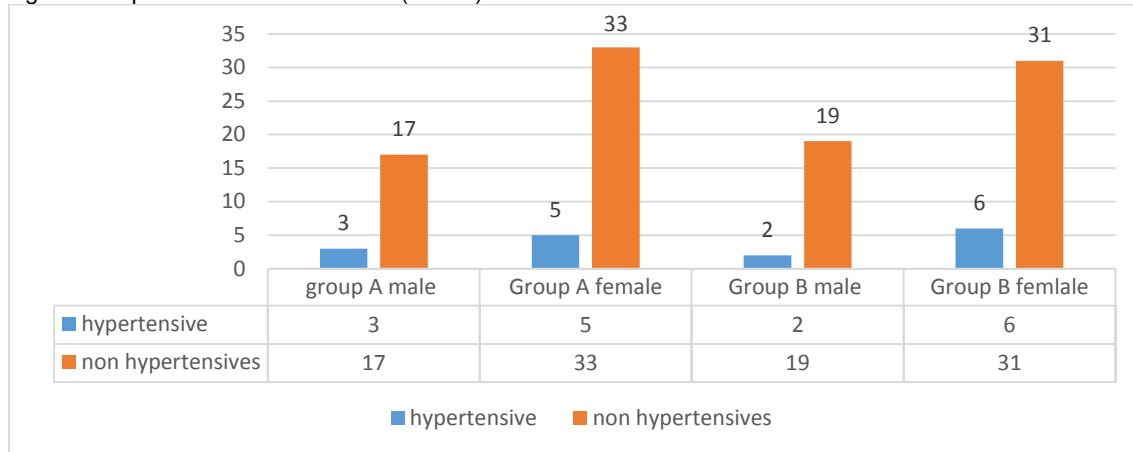


Fig. 3: Group wise distribution of diabetes mellitus (n=100)

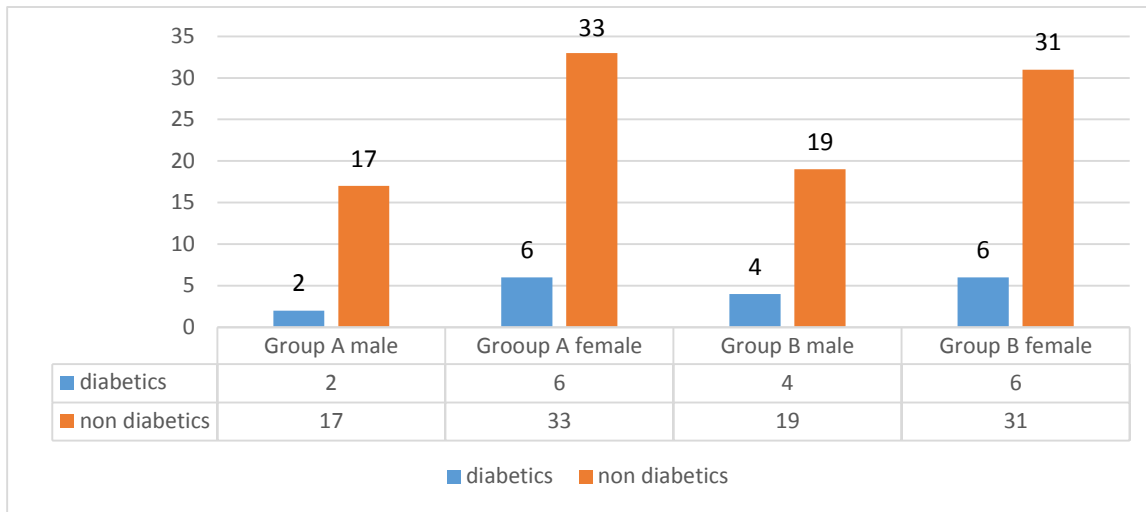


Fig.4: Group wise distribution of ASA score (n=100)

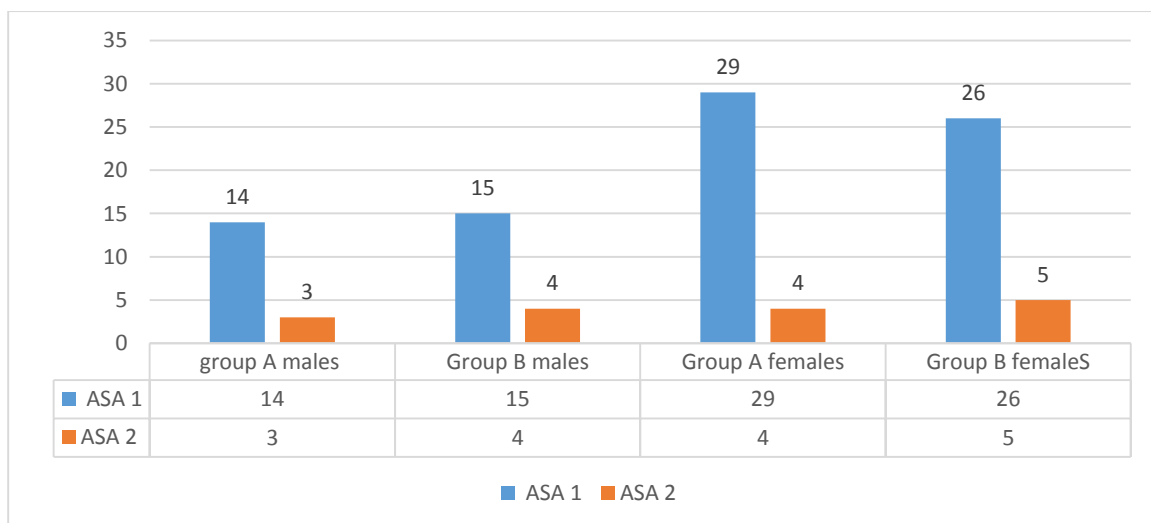
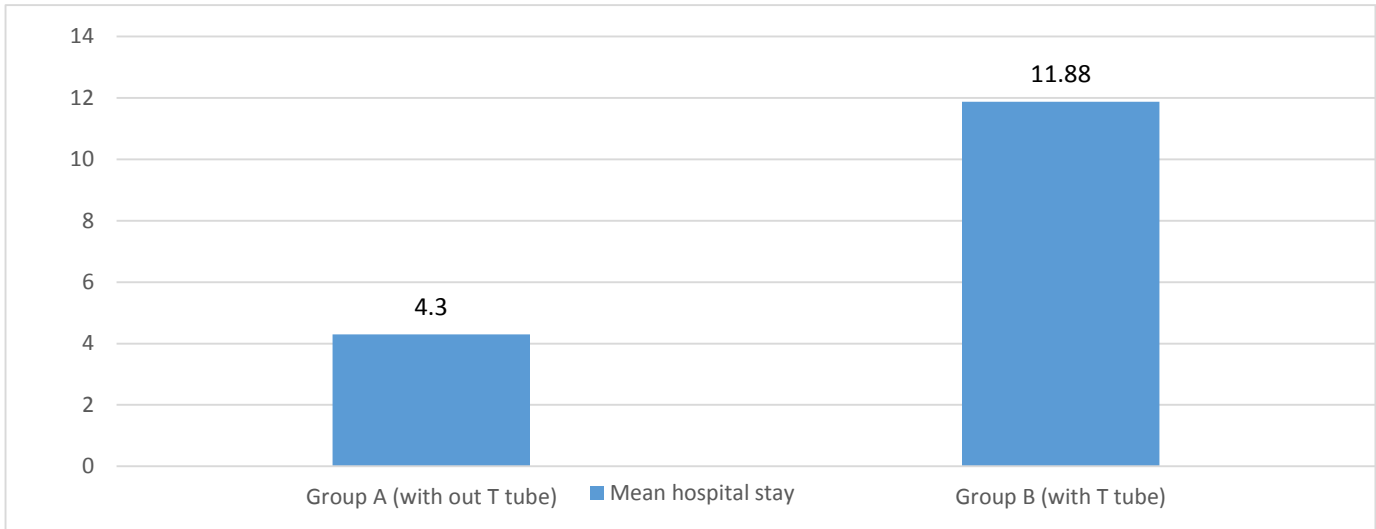


Fig. 5: Mean hospital stay in Group A(without T tube) and Group B (with T tube) (n=100)



DISCUSSION

This randomized controlled trial was conducted at shaikh zayed hospital Lahore to determine the difference of hospital stay between patients of choledocholithiasis who underwent CBD exploration with or without T tube.

In literature there are many studies carried out to determine the better option between the groups of CBD exploration with or without T tube. The surgery for the choledocholithiasis involves removing stones from CBD followed by placing a T-tube in common bile duct which is associated with longer hospital stay of 4.9+/-3.2 days and the choledochotomy with primary closure has lower hospital stay of 3.2 +/-2.1⁸. There is another study showing no significant difference of hospital stay between two groups with T-tube group 8.8 +/- 4.5days and without T-tube group 8.4 +/- 3.1 days with P value of >.05⁹. The results in above mentioned studies generate controversies and that's why this study was carried out to generate confirmatory results. In our study the mean hospital stay was shorter in CBD exploration without T tube as compare to hospital stay with T tube.

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