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Research Article

Evaluation of thyroid profile in biliary tract stones

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ABSTRACT

Background: In the course of clinical practice it has been observed that a no. of patients with biliary tract stones have hypothyroidism in their medical history. The prevalence of hypothyroidism is increased in patients of choledocholithiasis than in cholelithiasis patients. Aims and objectives: To find the prevalence of hypothyroidism in patients of cholelithiasis and choledocholithiasis.
Methods: This study was conducted in post graduate dept. of surgery, SMHS over a period of 2 years on a total of 100 patients, 50 diagnosed as having cholelithiasis and 50 having choledocholithiasis. A complete history, detailed clinical examination followed by evaluation as per protocol was done.
Results: There was an increased prevalence of choledocholithiasis with increasing age (max. pts. in age group 51-60) with female predominance in patients diagnosed as choledocholithiasis, thereby implying increasing age and female gender as risk factors for choledocholithiasis. There was a prevalence of 16% of hypothyroidism in patients of choledocholithiasis in comparison to 8% in cholelithiasis group with subclinical hypothyroidism present in maximum no. of patients (75%).
Conclusions: Hypothyroidism is more common in the choledocholithiasis patients as compared to cholelithiasis group, with female predominance and with subclinical variant in maximum No. of patients which support the hypothesis that hypothyroidism might play a role in the formation of CBD stones.

Keywords: Hypothyroidism, Choledocholithiasis, Cholelithiasis

INTRODUCTION

Choledocholithiasis have been noted in 6-12% of patients with cholelithiasis and may be small or large, single or multiple and this incidence increases with age to over 80% in those who are over 90 years old.[1] Since CBDs can be discovered preoperatively, intraoperatively or postoperatively[2] accurate preoperative prediction of choledocholithiasis is imperative to decrease operative risk and health care cost. On the other hand, preoperative diagnosis of CBDs can help surgeons to select type of surgery and surgical exploration, particularly laparoscopic cholecystectomy candidates. The standard preoperative workup for predicting choledocholithiasis includes Liver Function Tests (LFTs) and abdominal ultrasound (US). These tests combined with history and clinical examinations make the entire workup for most patients. Abnormalities in these tests may suggest the presence of choledocholithiasis. The transabdominal US, examination is the most commonly used screening modality. Other imaging tests as already mentioned above include endoscopic and laparoscopic US,

computed tomography, magnetic resonance cholangiopancreatography (MRCP), endoscopic retrograde cholangiopancreatography (ERCP), intraoperative cholangivgraphy (IOC), and Percutaneous Transhepatic Cholangiography (PTC).

The number of patients, unavailability, high cost and invasiveness of some of the test lead to use a screening modality for selecting patients and performing other advanced diagnostic tests on them.

The pathogenesis of gall stones & common bile duct stones is a complex process involving factors affecting bile contents & bile flow. Since Sandblom[3] first demonstrated the hormonal action of CCK on the sphincter of Oddi, several other hormones have been shown to affect sphincter of Oddi activity, prominent among which is estrogen and thyroid hormones which influence the sphincter of Oddi kinetics.

In the course of clinical practice it has been observed that a No. of patients with CBD stones have hypothyroidism in their medical history. Hypothyroidism is a common endocrine disorder, the incidence being about 350/1000000 mostly in women.[4]

The hypothyroidism can be either a subclinical variant or overt hypothyroidism. Subclinical hypothyroidism also called mild thyroid failure is diagnosed when peripheral thyroid hormones are within normal reference lab range but serum TSH levels are mildly elevated.[5] Subclinical hypothyroidism is a common problem in the population with a prevalence of 3%-8% in the population without known thyroid disease.[6,7] There are several explanations for a possible relation between hypothyroidism and gall stones & Common Bile Duct Stones, these explanations include.

1) Known link between thyroid failure and disturbances of lipid metabolism that may consequently lead to a change of composition of bile.[8-10]

2) Low bile flow to duodenum in the hypothyroid state.[11]

3) Sphincter of Oddi express thyroid hormone receptors and thyroxine has a direct pro-relaxing effect on the sphincter of Oddi.[12]

4) Thyroxine usage in certain cases has been suspected to dissolve gall stones & CBD stones.[13]

5) There is dysmotility of digestive tract in hypothyroidism.[14]

6) Biliary secretion of cholesterol is reduced in hypothyroidism, bile may also become supersaturated with cholesterol causing sludge or gall stone disease.

7) In some studies, hypothyroidism has been associated with reduced bilirubin excretion due to decreased actively of UDP glucuronyl transferase.[15,16]

METHODS

The present study was conducted in the department of surgery at SMHS hospital over a period of 2 years.

This study was performed on 50 documented cases of choledocholithiasis and 50 documented cases of cholelithiasis attending the outpatient department as well as the emergency department of surgery, SMHS hospital, Srinagar.

All the patients were worked up & assessed according to the following protocol.

1) Detailed history
2) Complete clinical examination
3) Complete blood count
4) KFT
5) LFT
6) Hepatitis serology
7) TFT
8) Sr. Amylase
9) Coagulation profile
10) Routine urine examination
11) Chest Radiograph
12) ECG
13) Transabdominal USG
14) MRCP
15) ERCP - If needed

The patients were grouped into two groups, patients diagnosed as choledocholithiasis (cases) and patients diagnosed as cholelithiasis (controls). Subsequent evaluation of patients was done with emphasis on thyroid profile and LFT.

Patients suspected of having choledocholithiasis by dilated CBD and elevated biochemical markers (Sr. bilirubin, Sr. ALP, Sr. ALT, Sr. AST), were subjected to further imaging by MRCP and managed by ERCP/Surgery as indicated.

Patients with a serum level TSH of 0.5-4.7 mIU/L was considered as normal. Serum level TSH of 4.7-10 mIU/L with normal T_3, T_4 level is considered as subclinical hypothyroidism. Levels of TSH >10 mIU/L is considered as clinical hypothyroidism.

RESULTS

Majority of the patients in either groups were in the 51-60 year age group. The mean age of cases was 57.89 in choledocholithiasis group and 52.64 in cholelithiasis group. The age distribution in either groups is depicted in Table 1.

Table 1: Age distribution.

Age group	Choledocholithiasis	Cholelithiasis
11-20	2 (4%)	2 (4%)
21-30	3 (6%)	9 (18%)
31-40	4 (8%)	9 (18%)
41-50	10 (20%)	10 (20%)
51-60	17 (34%)	12 (24%)
61-70	10 (20%)	5 (10%)
71-80	2 (4%)	3 (6%)
81-90	2 (4%)	0 (0%)

P value = 0.209

Females predominated in the cholelithiasis group and there was slight female preponderance in the choledocholithiasis group as depicted in Table 2 to follow.

Table 2: Sex distribution.

Sex	Choledocholithiasis	Cholelithiasis
Males	21 (42%)	13 (26%)
Females	29 (58%)	37 (74%)

P value = 0.013

A significant number of patients in the choledocholithiasis group compared to the gallstone group were hypothyroid and the difference was statistically significant summed up in Table 3.

Table 3: Thyroid status in both groups.

Thyroid status	Choledocholithiasis	Cholelithiasis
Hypothyroid	8 (16%)	4 (8%)
Euthyroid	42 (84%)	46 (92%)

P value = <0.001 (significant)

Majority of the patients in the hypothyroid group were having subclinical hypothyroidism with females predominating, depicted in Table 4.

Table 4: Clinical vs. subclinical hypothyroidism.

Sex	Subclinical	Clinical
Male	1	0
Female	5	2
Total	6	2

DISCUSSION

This was a hospital based study conducted on a total of 100 patients who presented to the outpatient departments of the postgraduate department of surgery, government medical college, Srinagar. The patients were grouped into two groups, one being diagnosed cases of choledocholithiasis (n=50) and other being diagnosed cases of cholelithiasis (n=50). In our study there was a prevalence of 16% of hypothyroidism in choledocholithiasis group as compared to 8% in the cholelithiasis, showing an increased prevalence of 100% in cases as compared to control group. This was statistically significant difference. Laukarrien J[17] in a study concluded that hypothyroidism is common in bile duct stone patients.

The increased prevalence in both the groups may be assigned to the fact that Kashmir is an endemic region for hypothyroidism but a 100% increase in prevalence of hypothyroidism in the cases group suggests that hypothyroidism has a role in the CBD stone formation.

The majority of our patients who were diagnosed as having choledocholithiasis with hypothyroidism were having subclinical hypothyroidism with 75% of patients (6/8) having subclinical hypothyroidism and only 25% (2/8) having clinical hypothyroidism.

Laukarrien et al.[18] in their study found a prevalence of hypothyroidism in 10.2%.

In the CBD stone group as compared to a total of 2.8% in the control group. The prevalence of hypothyroidism was 3 to 4 times higher in the control group. There was a statistical significant difference between the prevalence of hypothyroidism in the case and control group.

Inkinen et al.[19] concluded in their study that there is an association between CBD stone patients and treated hypothyroidism. The results of the study revealed that prevalence of primary hypothyroidism was 8% in the study group as compared to 1% in control group with a P value <0.01.

There was a female gender predisposition with 87% (7/8) of patients being females in the choledocholithiasis with hypothyroidism group.

There was a prevalence of 20% of hypothyroidism in females diagnosed as choledocholithiasis. Further, on evaluation it was found that around 17% of females with choledocholithiasis had subclinical hypothyroidism. All patients who were diagnosed as having hypothyroidism were in the age group of 41-70 years with the majority being in the age group of 51-60 years. Among 8 patients diagnosed as hypothyroid in the study group, 5 were in the age group of 51-60 years revealing an increasing prevalence of hypothyroidism with age. These results were in statement to the results of previous studies.

CONCLUSION

A prevalence of 16% of hypothyroidism among choledocholithiasis patients over the age of 60 years of age with female predominance was inferred from the study, thereby indicating that patients diagnosed as choledocholithiasis in this age group should be screened

for current thyroid dysfunction. Nearly 20% prevalence of subclinical in females in age group of 60 years in cases suggest that atleast this subset of patients should be screened for thyroid dysfunction.

To conclude, subclinical hypothyroidism is more common in the choledocholithiasis patients as compared to cholelithiasis group which support the hypothesis that hypothyroidism might play a role in the formation of CBD stones.

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