

Prevalence of Sub-Clinical Hypothyroidism in Diagnosed Cases of Gallstone Disease

Abstract [please clarify aim and purpose of study in abstract and introduction]

Thyroid issues have long been debated as a possible cause of gall stone disease. The link between hypothyroidism and gallstone disease could be explained in a variety of ways. A prospective study was conducted in surgical wards of Department of surgery sree balaji medical college from 2016 to 2017. Cholelithiasis is more commonly seen in females than males in our study. The cholelithiasis is more common in the age group of 41 to 60 years. Abdominal pain and vomiting was the most common symptoms followed by nausea, Fever, Loss of appetite and jaundice. Out of 22 patients 19 patients (86.4%) had normal TSH, 2 patients (9.1%) had increased TSH, 1 patient (4.5%) had decreased TSH. Raised TSH was more in the AGE Group of 61- 75 years, which is comparable to other studies. Out of 22 patients, in our study all 22 patients (100%) had normal T3 levels. Out of 22 patients, 19 patients (86.4%) had normal T4 levels, 2 patients (9.1%) had decreased T4 level, and 1 patient (4.5%) had increased T4 levels. Out of 22 patients, 19 patients (86.4%) had normal T4 levels, 2 patients (9.1 %) had decreased T4 level , and 1 patient(4.5%) had increased T4 levels. Of total 22 patients, 19 patients (86.4%) had normal Ultrasound examination of neck and 3 patients (13.6%) had abnormal Ultrasound Neck findings. Hence In our Study Cholelithiasis is most commonly seen in Females of age group of 41-60 years and prevalence of raised TSH level in cholelithiasis patient was 9% and most were found in the age group of 61-80 years.

Keywords: Cholelithiasis, Hypothyroidism, Gallstone Disease

Introduction:

Gallstones are the most prevalent biliary pathology and are classified as cholesterol, pigment (black, brown), or mixed stones. Cholesterol or mixed stones are composed of 51–99% cholesterol, as well as calcium salts, bile acids, bile pigment, and phospholipids [1]. Gallstones can be solitary or numerous, large or small, and radio-opaque if they contain calcium salts. It is commonly known that hypothyroidism causes gastrointestinal hypo activity [2]. Thyroxine has a direct effect on the Sphincter of Oddi's motility control mechanisms. Because thyroxine has a calming effect on the pre-contracted SO, hypothyroidism may result in increased SO tension due to a lack of thyroxine or insufficient thyroxine levels [3,4]. There have been few previous investigations on the prevalence of

thyroid problems in healthy people. According to a recent study from the United Kingdom, thyroid issues affect 3.6 % of healthy people. There has been debate for a decade about whether thyroid issues might cause gallstone disease [5-7]. There are various plausible explanations for a probable association between hypothyroidism and gallstone disease; these possibilities include the established link between thyroid failure and lipid metabolic abnormalities, which may lead to a change in bile composition. Low biliary flow has also been found in hypothyroid people in recent research [8]. As a result, numerous mechanisms for thyroid hormone action leading to gall stone formation have been hypothesised. This study was done to determine the prevalence of hypothyroidism in cholelithiasis patients in order to shed light on the relationship between hypothyroidism and cholelithiasis.

Materials and Methods

This prospective study was conducted in surgical wards of Department of surgery sreebalaji medical college From 2016 to 2017. A total of 22 patients with Gallstone disease were selected randomly for the study.

Inclusion criteria

- Patients from both sexes of various age groups of 26 yrs to 75 years of age.
- All patients admitted with Gallstone disease were taken into consideration.

Exclusion criteria

- Patients less than 26 years and more than 75 years (why you excluded these groups??)
- Pregnant women.
- Patients who were in septicemia
- H/o haemolytic disorders
- Patients who are diagnosed hypothyroidism/ hyperthyroidism.
- Include prescribed medications known to affect the thyroid function test such as phenytoin, carbamazepine, metoclopramide, amiodarone, and lithium]

Each selected patients under went detailed history and complete physical examination. History regarding age, sex, socioeconomic status, rural or and urban were taken.

Apart from above mentioned general history

- Pain abdomen.

- Nausea
- Vomiting.
- Fever
- Loss of appetite.

A general physical examination of all patients was done along with detailed Abdominal examination. All routine laboratory investigations including: Random blood sugar, hemoglobin, total leukocyte count, urea, creatinine.

- Thyroid function test: T3, T4, TSH
- Ultrasonography Abdomen.
- Ultrasonography Neck.

Data was entered and analysed using statistical package solution software (SPSS Version 15). Percentages were calculated and the results obtained were presented in the form of tables and graphs. Data was analysed using descriptive statistical method. **Suggest for fisher exact test and chi square test for all prevalence variables comparing age, sex, type of stones with TSH, USG findings et**

Results

In our study 22 patients with cholelithiasis were enrolled.

SEX DISTRIBUTION IN OUR STUDY

Out of these 22 patients, 15 patients were FEMALES and 07 patients were Males (Table 1).

TABLE No 1. SEX DISTRIBUTION IN OUR STUDY

SEX	NUMBER OF PATIENTS	PERCENTAGE (%)
MALE	07	31.82
FEMALE	15	68.18

TOTAL	22	100
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AGE DISTRIBUTION IN OUR STUDY

In our study 22 patients with cholelithiasis were enrolled. Out -of 22 patients, 5(22.7%) patients were of age group 20 to 40 years, 13(59.1)patients were of age group 41 to 60 years, 04(18.2%) patients were of age group 61 to 80 years (Table 2).

TABLE No 2. SHOWING AGE DISTRIBUTION IN OUR STUDY

AGE	NUMBER OF PATIENTS	PERCENTAGE(%)
25 -40 YEARS	05	22.7
41 -60 YEARS	13	59.1
61 -75 YEARS	04	18.2
TOTAL	22	100

CLINICAL SYMPTOMS

In our study of 22 patients, all 22 patients (100%) presented with abdominal pain.11 patients (50%) presented with associated vomiting, 6 patients (27.3 twelveth %) presented with nausea, 2 patients (9.1%) presented with jaundice, 3 patients(1 3.6%) presented with loss of appetite,06 patients (27.3%) presented with fever (table 3).

TABLE 3: SHOWING CLINICAL SYMPTOMS IN OUR STUDY

CLINICAL SYMPTOMS	NUMBER OF PATIENTS	PERCENTAGE (%)
ABDOMINAL PAIN	22	100
VOMITING	11	50
NAUSEA	06	27.3
JAUNDICE	02	9.1

LOSS OF APPETITE	03	13.6
FEVER	06	27.3

To conclude all 22 patients (100%) had pain abdomen. 11 patients (55%) had Pain Abdomen and vomiting. 3 patients (13.6%) had pain abdomen, Vomiting and Nausea. 1 patient (4.5%) had pain Abdomen, vomiting nausea and jaundice. 1 patient (4.5%) had pain abdomen, vomiting, nausea and loss of appetite. 3 patients (13.6%) had pain abdomen, vomiting and Fever (Table 4).

TABLE 4: SHOWING SYMPTOM COMPLEX OF CHOLELITHIASIS

SYMPTOM COMPLEX	NUMBER OF PATIENTS	PERCENTAGE
Pain abdomen., Vomiting, Nausea, and Fever	1	4.5%
Pain abdomen and Vomiting.	4	18.1%
Pain abdomen and Loss of Appetite.	1	4.5%
Pain abdomen, vomiting, Nausea and Jaundice.	1	4.5%
Pain abdomen	5	22.7%
Pain abdomen, Vomiting and Fever	3	13.6%
Abdomen pain and fever	1	4.5%
Abdomen pain and Nausea	2	9.1%
Abdomen pain, vomiting, Loss of Appetite.	1	4.5%

Pain abdomen, vomiting,		
Nausea and Loss of Appetite.	1	4.5%
Abdomen pain and Nausea and Fever.	1	4.5%
Pain abdomen and Jaundice.	1	4.5%
Total	22	100

USG ABDOMEN

All 22 patients in our study had undergone ultrasound examination of abdomen and all patients had cholelithiasis.

Size of stone ^{??} AND if there was a relation between level of TSH, thyroxin and size of stone

THYROID PROFILE TSH LEVELS

There were 22 patients in our study, and all were tested for TSH level out of which 19 patients (86.4%) had normal TSH, 2 patients (9.1%) had increased TSH, 1 patient (4.5%) had decreased TSH (Table 5).

TABLE 5: SHOWING TSH DISTRIBUTION IN OUR STUDY

THYROID PROFILE	NUMBER OF PATIENTS	PERCENTAGE (%)
NORMAL TSH	19	86.4
INCREASED TSH	02	09.1
DECREASED TSH	01	04.5
TOTAL	22	100

T4 LEVELS DISTRIBUTION IN OUR STUDY

In our study out of 22 patients, 19 patients (86.4%) had normal T4 levels, 2 patients (9.1

) had decreased T4 level, and 1 patient(4.5%) had increased T4 levels (Table 6).

TABLE 6: T4 DISTRIBUTION IN OUR STUDY

	NUMBER OF PATIENTS	PERCENTAGE (%)
T4 LEVELS	NUMBER OF PATIENTS	PERCENTAGE
NORMAL T4	19	86.4
INCREASED T4	01	04.5
DECREASED T4	02	09.1
TOTAL	22	100

USG NECK FINDINGS IN OUR STUDY

In our study of total 22 patients, 19 patients (86.4%) had normal Ultrasound examination of neck and 3 patients (13.6%) had abnormal Ultrasound Neck findings (Table 7).

TABLE 7: USG NECK FINDINGS IN OUR STUDY

FINDINGS	NUMBER OF	FINDINGS
NORMAL STUDY	19	86.4
ABNORMAL STUDY	03	13.6
TOTAL	22	100

Discussion

Gall stone etiologies have been studied more thoroughly in the last two decades. Gall stones and delayed biliary tract emptying in hypothyroidism have been linked, in addition to traditional risk variables such as age, gender, weight, and heredity. The incidence of thyroid

dysfunction in patients with gallstone disease was investigated in this study. Thyroid dysfunction is marked by elevated TSH levels in the blood. Increased serum TSH levels, T4 levels, and a lack of clinical symptoms describe the subclinical form of hypothyroidism. Cholelithiasis is most usually seen in females between the ages of 41 and 60, and the incidence of elevated TSH levels in cholelithiasis patients was 9%, with the majority being between the ages of 61 and 80 [9,10].

Hypothyroidism patients are more likely to have elevated serum cholesterol levels. Thyroid hormones have a multifaceted effect on cholesterol metabolism. Thyroid hormones affect cholesterol production, absorption, and use. Although the case group's mean cholesterol levels were not comparable to the control group's [10],

In the study conducted by Yousif et al age distribution of patient is presented with cholelithiasis were 26.7% in the age group of 25 to 40 years, 61.3% in the age group of 41-60 years, and 12% in the age group of 61 to 75 years [11]. In the study conducted by Hassan et al, there were 21.3% in the age group of 25 to 40 years, 74.3% in the age group of 41-60 years and 04.4% in the age group of 61 to 75 years [12]. In our present study there were 22.7% in the age group of 25-40 years. 51.9% in the age group of 41 to 60 years and 18.2% in the age group of 61 to 75 years.

Comparison study of thyroid profile

In our study 22 patients with cholelithiasis were enrolled, out of these patients 9.1 % has Gall stone with low T4, 4.5% had Gallstones with Low TSH and 9.1% had Gallstones with high TSH. From The above table and graph Gallstone with low T3 and T4 in study conducted by Hassan et al was 8.9%, but in our study it was 0%. In Study conducted by Hassan et al Gallstone with low T4 was 1.3%, and in our study it is 9.1%. In the study conducted by Hassan et al Gallstones with low T3 was 0.5%, but in our study it is 0%. In the study conducted by Hassan et al Gallstones with high TSH was 1.1% [12] and in our study was 9.1 %. In our study Gallstones with low TSH was 4.5%.

Conclusion

In this study, the prevalence of hypothyroidism in cholelithiasis has increased. Hypothyroidism in the subclinical stage is more common than hypothyroidism in the clinical stage. Females are more likely than guys to have hypothyroidism. Patients with cholelithiasis who are over 40 years old are more likely to have hypothyroidism. TSH should be checked because most people are subclinically hypothyroid, with patients over 40 years of age receiving special attention. This rise in incidence may have an impact on

cholelithiasis patients' diagnostic and treatment workups. Cholelithiasis is most commonly seen in Females of age group of 41-60 years and prevalence of raised TSH level in cholelithiasis patient was 9% and most were found in the age group of 61-80 years.

Reference

1. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes Care*.2010;33Suppl1:S62–9.
2. Laukkarinen J, Kiudelis G, Lempinen M, Rätty S, Pelli H, Sand J. et al. Increased prevalence of subclinical hypothyroidism in common bile duct stone patients. *J Clin Endocrinol Metab*. 2007;92:4260–4.
3. Inkinen J, Sand J, Nordback I. Association between common bile duct stones and treated hypothyroidism. *Hepatogastroenterology*. 2000;47:919–921.
4. Honoré LH. A significant association between symptomatic cholesterol cholelithiasis and treated hypothyroidism in women. *J Med*. 1981;12:199–203.
5. Volzke H, Robinson Dm, John U. Association between thyroid function and gallstone disease. *World J Gastroenterol*. 2005;11:5530–4.
6. Owen PJ, Lazarus JH: Subclinical hypothyroidism: The case for treatment. *Trends EndocrinolMetab* 14:257, 2003.Shwartz Principles of General surgery.
7. Yokohata K, Tanaka M: Cyclic motility of the sphincter of Oddi. *J Hepato-Biliary-Pancreatic Surg* 7:178, 2000. [PMID: 10982610oral Shwartz Principles of General Surgery
8. Johanna Laukkarinen, GediminasKiudelis, Marko Lempinen, Sari Ra` ty, Hanna Pelli, Juhani Sand, EskoKemppainen, CajHaglund, and IstoNordback Department of Gastroenterology and Alimentary Tract Surgery (J.L., S.R., H.P., J.S., I.N.), Tampere University Hospital.
9. Honore LH.A significant association between symptomatic cholesterol cholelithiasis and treated hypothyroidism in women. *J med* 1981;12;199-203.
10. HenryVolzke, Daniel M Robinson,UlrichJohn.Association between Thyroid function and gall stone disease 2005. *World journal of gastroenterology* 11(35);5530-5534

11. Yousif HH. Relationship Between Serum Levels of TSH and Cholesterol with Types of Gallstones. The Iraqi Med Postgraduate J. 2011;10(1):1-4.
12. Hassan BA. Changing Pattern and Incidence of Gallstone Diseases in Al-Kadhymia Teaching Hospital. Al-Nahrain College of Medicine 2003; ISSN 1681-6579 Iraq

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