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THE ASSESSMENT OF HYPOTHYROIDISM AS A POSSIBLE ETIOLOGICAL FACTOR FOR GALLSTONE FORMATION

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ABSTRACT
Gall stones are the most common biliary pathology and recent studies show that 10–15% of adult population in USA has gall stones (20 millions), 3% of them underwent cholecystectomy, 85% of them are asymptomatic, 1–4% of them develop symptoms each year, and females are more affected than males 3:1. For decades, there has been a discussion, whether thyroid disorders could cause gallstone disease. Interestingly it has been reported that the risk, in particular, for gall stones, increases in clinical and subclinical hypothyroidism. There are multiple factors that may contribute to the formation and/or accumulation of gall stones in hypothyroid patients, including decreased liver cholesterol metabolism, diminished bile secretion, and reduced Sphincter of Oddi relaxation. This cross sectional study aimed to assess the prevalence of hypothyroidism in patients with gall stones and tried to establish hypothyroidism as a possible etiological factor for gallstones formation. Our study was carried out at department of surgry at Al-Sadir hospital in Baghdad/Iraq on 100 patients with cholelithiasis admitted to the hospital during the period from October 2017 to October 2019. All patients were assessed by detailed clinical history and examination with appropriate investigations in the form of abdominal USG, thyroid function tests and lipid profile. Out of the 100 patients with gallstone, 80 patients were suffering from euthyroid and 20 of them were having subclinical hypothyroidism. The highest number of patients belonged to the age group of 41-50 years (31%), and the majority were females 72 (72%). Out of the 25 patients diagnosed with subclinical hypothyroidism, 19 (76%) were females. The results also showed that 52 (52%) patients presented with complaints of fatty dyspepsia followed by 37 (37) % with biliary colic and 11 (11%) with pain of right hypochondrium. It can be concluded from our study that it is evident that subclinical hypothyroidism is also associated with gall stones and in women with the age group of more than 40. Most importantly, when treating patients with gall stones or microlithiasis, clinicians should be aware of the possible hypothyroid background and consider examining the thyroid function.

KEYWORDS: Hypothyroidism, Gall stones, Subclinical thyroid dysfunction.

INTRODUCTION
The prevalence of gall stone disease varies along demography, age, sex, geography, food habits, sedentary life style and obesity. Until now, Cholelithiasis was believed to occur in sedentary people and was thought to be associated with lipid disorder. It was considered to be a disease of fat, forty and fertile females.[1,2] Now the focus has shifted to its association with hypothyroidism since many patients with cholelithiasis were found to have hypothyroidism in the last two decades. Hypothyroidism, not only increases the risk for gallbladder stones[3,4], but also the risk for common bile duct (CBD) stones, in particular.[5-7] These conditions are quite often under diagnosed due to the absence of symptoms and are revealed only on thyroid assays, chiefly TSH.

MATERIALS AND METHODS
This prospective time bound non-randomized study was done on all the patients of gall stone disease admitted to department of surgry at Al-Sadir hospital in Baghdad/Iraq from October 2017 to May 2019.

Patients with ultrasound proven cholelithiasis wre included in this study, while patients with a history of previously diagnosed or treated thyroid function abnormalities, history of thyroidectomy, ongoing pregnancy, serious underlying diseases, patients on oral contraceptives, sepsis or cholangitis and those prescribed medications known to affect the thyroid function test such as phenytoin, carbamazepine, metoclopramide, amiodarone, and lithium were excluded.

The study population was divided according to the TSH and T3/T4 reference values that were provided by the laboratory into three groups:

1. Subclinical hypothyroidism: symptom free patients with TSH concentration above upper limit of normal range and normal values of T3/T4.
2. Clinical hypothyroidism: in which there are symptoms of hypothyroidism with TSH level above the upper limit and T3/T4 below normal limit.
3. Euthyroid group: in which clinical and lab tests are within normal range.

Venous blood was collected from each patient and sent to the central laboratory of the hospital for the estimation of serum T3 T4 and TSH. The minimum detectable concentration of T3 and T4 by this assay was estimated to be 0.2 ng/ml and 0.4 µg/dl respectively.

A complete clinical profile i.e. a detailed history was recorded and physical examination was done. Routine blood examination, liver function test, thyroid function test and ultrasound abdomen was performed in every case at the time of admission. USG abdomen was done using a 5 MHz transducer and a high-resolution monitor. The sonographers were unaware of the participant's clinical and laboratory characteristics.

STATISTICAL ANALYSIS

All statistical analyses were performed with SPSS software, version 20. Data on quantitative characteristics were expressed as mean ± SD. Comparisons between groups were made using $\chi 2$-test (qualitative data) and analysis of variance (ANOVA, quantitative data). All analyses were adjusted for age and further potential confounders.

RESULTS

Table 1: Age-group based distribution of Patients (n=100).

Age Group	Frequency	Percentage
11-20 Years	1	1 %
21-30 Years	7	7%
31-40 Years	23	23%
41-50 Years	31	31%
51-60 Years	19	19%
61-70 Years	16	16%
71-80 Years	3	3%
Total	100	100%

Table (2): Gender wise distribution of Patients (n=100)

Sex	Frequency	Percentage
Female	72	72%
Male	28	28%
Total	100	100%

Table (3) Thyroid function status of enrolled patients.

TFT	Frequency	Percentage
Euthyroid	80	80%
Subclinical Hypothyroid	20	20%
Total	100	100%

Table (4): Gender-wise distribution of patients with subclinical hypothyroidism.

Sex	Subclinical hypothyroidism (n=25)
Female	19 (76%)
Male	6 (24%)
Total	25 (100%)

Table (5): Symptoms-based distribution of patients (n=100).

Symptoms of cholelithiasis	Frequency	Percentage
Biliary colic	37	37%
Fatty dyspepsia	52	52%
Pain Right Hypochondrium	11	11%
Total	100	100%

Table (6): **Symptoms-based Gender Wise distribution of patients (n=100).**

Sex	History of Biliary colic	Fatty dyspepsia	Pain Right Hypochondrium
Female	32	34	6
Male	10	16	2
Total	42	50	8

DISCUSSION

The relatively small number of patients resulted from the exclusion of patients with previously known thyroid disorder who were 95 patients. The patients were excluded due to previous thyroid surgery, receiving thyroid medication, with choledocholithiasis and ingestion of radioactive iodine administration.

Subclinical hypothyroidism is a predominant disorder among adult population; however, it is often overlooked.

In our study, youngest patient was of 13 years of age and eldest was 75 years old. The majority of patients were in the age group of 41-50 years (31%) and this can be contributed to the sex hormone imbalance of this age group which is similar to the study done by Ahmed et al[8] where eight patients of the total 100 patients who were detected as having subclinical hypothyroidism, were in the age group of 41–70 years. Among 8 patients detected as hypothyroid in the study group, 5 were in the age group of 51–60 years indicating an increasing occurrence of sub clinical hypothyroidism with age.

Age is a main risk factor for gallstone formation, and the age of 40 years appears to denote the cut-off between relatively low and high rates of cholecystectomies. Between the ages of 40 and 69 years, the incidence is 4 times higher than in younger subjects. The study of Laukkarinen et al[9] showed that thyroid function abnormalities even mild and preclinical should be screened in patients with gallstones especially in women above 60 years. This matched with the results of our study regarding age group and its distribution because with increasing age there is a decrease in water contents of body which may reach 45% of body weight, and this is due to a decrease in lean (muscle) mass of the body which may lead to more concentrated body fluids and excretions and more deposition of solid contents of the excretions which may lead to nucleation and formation of gall stones.

The high incidence in females associated with gall stones, i.e., Forty, Fatty and Fertile female is well known worldwide. This study also supports the above said saying by giving a recording of 72% of gall stones in women compared to 28% in men which is in concordance with a study conducted by Volzke H et al[10] who showed that women were affected nearly twice as often as men, while gallstones were only slightly more often detected by ultrasound in women than in men.

Out of 100 patients subjects, 80 (80%) were found to be euthyroid, whereas 20 (20%) were found to be in the range of subclinical hypothyroidism.

In a study done by Johanna et al[11] in 2007, the prevalence of subclinical hypothyroidism was 11.4%, which is close enough to our study (20%).

Out of the 25 patients diagnosed with subclinical hypothyroidism, 19 (76%) were females and 6 (24%) were males which is in concordance with study done by Volzke H et al[10] on earlier diagnosis and treatment of hypothyroidism in women compared with men. This assumption is supported by the fact that the association between high serum TSH levels and cholelithiasis was mainly found in females with sonographically detected gallstones as proven in our study and still more predominant in female gender.

REFERENCES

1. I.J. Beckingham, B.J. Rowlands Post cholecystectomy problems. H. Blumgart (ED.), Surgery of Liver and Biliary Tract 3rd edition, WB Saunders, London, 2000; 186.
2. A. Nakeeb, A.G. Comuzzie, L. Martin, *et al.* Gall stones: genetics versus environment Ann. Surg., 2002; 235: 842.
3. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC. The Colorado thyroid disease prevalence study. Arch Intern Med., 2000; 160: 526–534.
4. Laukkarinen J, Sand J, Saaristo R, Salmi J, Turjanmaa V, Vehkalahti P, Nordback I. Is bile flow reduced in patients with hypothyroidism? Surgery, 2003; 133: 288–293.
5. Inkinen J, Sand J, Arvola P, Pörsti I, Nordback I. Direct effect of thyroxine on pig sphincter of Oddi contractility. Dig Dis Sci., 2001; 46: 182–186.
6. Cicala M, Habib FI, Fiocca F, Pallotta N, Corazziari E. Increased sphincter of Oddi basal pressure in patients affected by gall stone disease: a role for biliary stasis and colicky pain? Gut., 2001; 48: 414–417.
7. Honoré LH. A significant association between symptomatic cholesterol cholelithiasis and treated hypothyroidism in women. J Med., 1981; 12: 199–203.
8. Mir Mujtaba Ahmad, Mir Irfan Nazirl, Haneef Mohamed Darl, *et al.* Evaluation of thyroid profile in biliary tract stones International Surgery Journal, 2015; 12(3): 344.
9. J. Laukkarinen, J. Sand, R. Saaristo et al., "Is bile flow reduced in patients with hypothyroidism?" Surgery, 2003; 133(3): 288–293.
10. Volzke Henry, Daniel M. Robinson, John Ulrich, et al. Association between thyroid function and gallstone disease World J. Gastroenterol., 2005; 2(35).
11. J. Laukkarinen, G. Kiudelis, M. Lempinen, et al. Increased prevalence of subclinical hypothyroidism Metab, 2007; 92(11): 4260-4264.