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Correlation between Gallstones and Hypothyroidism: Our Experiance

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Abstract

Background: Among biliary pathology, Gallbladder Stones are the most common. There are well established risk factors associated with formation of Gallstone. Since Biliary motility is affected by thyroid hormone, Patients with hypothyroidism will have Gallbladder Hypokinesia and deranged lipid metabolism leading to formation of Gallstones.

Aims & Objectives: The aim of this study is to find out the hypothyroidism is a risk factor in formation of specific type of Gall stone.

Methods: A total of 50 patients with gallstone disease were included in the study. Thyroid function tests were performed in all of them. And divided in to two group, Group-A 25 Euthyroid patients and Group-B 25 Hypothyroid patients and morphological type of gallstones assessed post operatively (Pigment or Cholesterol stones).

Results: Of the 50 patients included in the study, Group A patient had 18 Pigment stones and 7 Cholesterol stones in Gallbladder and Group B patient had 15 Pigment stones and 10 Cholesterol stones in Gallbladder. On Statistical analysis, the p-value is 22067. The result is not significant at $p<.05$.

Conclusion: Gallstones are more common in patient with hypothyroidism compared to general population but hypothyroidism does not promote any specific type of stone formation. Which suggest that Hypothyroidism is not the individual risk factor for gallstone formation.

Keywords: Cholelithiasis; Hypothyroidism; Pigment stones; Cholesterol stones; Gallstones; Biliary stones.

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Introduction

Biliary stones are one of the commonest conditions seen in surgical practice. There are multiple risk factors and mechanisms of formations of Biliary stones. Of which Hypothyroidism being risk factor is under study with positive results.[1] Cholesterol stones are formed by supersaturation of bile with cholesterol. Pigment stones are formed by supersaturation of unconjugated bilirubin within the bile. Hypothyroidism induces cholesterol gallstone formation by promoting cholesterol biosynthesis.[2] In this study we are evaluating whether Hypothyroidism promotes any particular type of gallstones.

There are various possible relations between hypothyroidism and biliary stone formation.

Hypothyroidism Reduces Bile Flow into the Duodenum[3], Hypothyroidism Leads to Impaired SO Relaxation[4], hypothyroidism causes decrease in liver cholesterol metabolismwhich results in supersaturation of bile cholesterol.[5]

Materials and Methods

This is a cross-sectional, observational study performed at Kempegowda Institute of Medical Sciences and Research Centre, Bengaluru over the period of one year from January 2018 till December 2018, this study included 50 patients, with cholelithiasis or choledocholithiasis diagnosed by ultrasound abdomen, who were admitted for the management of Biliary stone disease, in the department of general surgery. We have excluded patient with hemolytic disorders, liver disorders and patient underwent thyroid surgery.

All the patients underwent general preoperative Investigations including Thyroid function test, and patients were categorized in to two groups i.e. Group-A Euthyroid patients and Group-B Hypothyroid patients. As per hospital reference values, patients with thyroid stimulation hormone (TSH) between 0.27 and 4.2 IU/ml were considered euthyroid, TSH >4.2 as hypothyroid. Postoperative data regarding type of stone (pigment or cholesterol) in each patient collected.

Results

The study included 50 patients with biliary stones, and divided into two groups. The majority of them were in 20–40 years age group, the mean age of patients was 45 years. Group-A includes 25 patients with normal thyroid function test and group-B included 25 hypothyroid patients. Out of 25 Group-A patients, 18 patients had Pigment stones and 7 Cholesterol stones in Gallbladder and Group B patient had 15 Pigment stones and 10 Cholesterol stones in Gallbladder.

Chart 1: Age and sex distribution.

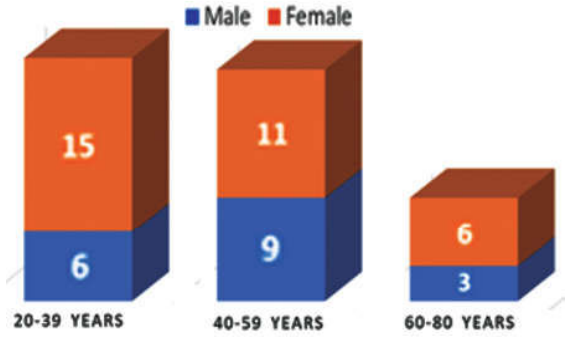


Table 1: Type of stone in each group.

	Group A (Euthyroid)	Group B (Hypothyroid)
Pigment stones	18	15
Cholesterol stones	7	10

The $\chi 2$ value is 1.5. The p-value is .22067. The result is not significant at $p<.05$.

Discussion

Several studies have been conducted in the past to understand the relation between thyroid function and cholelithiasis.[6-8] The present study was conducted to know whether Hypothyroidism promotes any specific type of gallstones. To our knowledge none of the existing studies have taken type of stone into consideration.

In our study we did included 50 patients with Biliary stone disease and divided them in Euthyroid and Hypothyroid group and data were compared and statistically analyzed. We have used chi square test and results were obtained, the $\chi 2$ value is 1.5. The p-value is .22067. The result is not significant at $p<.05$.

Hence based on above findings, it shows that hypothyroidism does not promote either cholesterol or pigment stone in particular.

Conclusion

There was no relation between hypothyroidism and cholesterol stone, compared to euthyroid group. The patients with hypothyroidism may have more prevalence of biliary stones but not any particular type of stone.

Ethical approval

Yes, Ethical Approval and patient consent under supervision of institutional ethical comette, Kempegowda Institute of Medical Sciences and Research Centre, K.R Road, VV Puram, Bangalore, Karnataka Pin: 560004, India

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Conflicts of interest: There is no conflict of interest.

Referances

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