ORIGINAL RESEARCH PAPER

Volume-8 | Issue-1 | January-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF SUBCLINICAL HYPOTHYROIDISM IN GALL BLADDER STONE DISEASE.

General Surgery

Dr.Vadicharla Manjusha* M.S.(Gen),Assistant Professor Of General Surgery,Gandhi Medical College/Hospital, Dr KNR University Of Health Sciences, India *Corresponding Author

Dr V Lakshmi Sravanthi PG Y3, Gen.Surg Dept.,Gandhi Medical College, Dr KNR University of Health Sciences, India

ABSTRACT

To study the prevalence of subclinical hypothyroidism in patients with gall stone disease in a tertiary care hospital and its statistical significance By treating subclinical hypothyroidism whether it is possible to prevent the progression of gall stone disease.

KEYWORDS

Gall stone disease, hypothyroidism in gall stone disease.

INTRODUCTION:

Gall Bladder stone disease, more commonly called as Cholelithiasis or gall stones, is a very common abdominal pathology encountered by the surgeon. The estimated prevalence of gallstones is 10%–15% in the general population. Cholesterol gallstones, whose content is >50% cholesterol, are responsible for 90% of all gallstones in Western countries

The relation between hypothyroidism and cholelithiasis has been open for debate for many decades

One possible explanation is the link between thyroid failure and the disturbances in lipid metabolism in our body, which will lead to a change in the composition of the bile. Studies have demonstrated low bile flow in patients with hypothyroidism. The Sphincter of Oddi also expresses the thyroid receptors and thyroxine has a prorelaxing effect on the sphincter of oddi. So,the decrease in bile flow,leading to stasis and sphincter of oddi dysfunction lead to the formation of gall stones. Hence, if an increase in prevalence of hypothyroidism is associated with gall stones,it may have an effect on the diagnostic as well as the therapeutic work up of the patients with gall stones.Thus,the study intends to find out the prevalence of undiagnosed hypothyroidism in patients with cholelithiasis. The aim of the study is to know the prevalence of subclinical hypothyroidism in patients with symptomatic gall stone disease in a tertiary care hospital and its statistical significance. The prevalence of hypothyroidism is reported to be 5-25% in various countries of the world2 . The prevalence of hypothyroidism in Iran is around 7%. In the Europe,the incidence is about 6.5%.It represents about 30-40% of the patients in the endocrine practice.

The pathogenesis of gall stone appears to be multifactorial . It has been shown that disturbances in lipid metabolism that occur during hypothyroidism, particularly cholesterol pathway,changes the rate of bile excretion and lead to the formation of gall stones. The pro-relaxing effect of serum total Thyroxine (T4) on human has been proven.

Possibly,the lack of thyroxine may contribute to Sphinter of Oddi contractility which in turn not only disturbs the normal bile flow but also prohibits the passage of stones formed in the gall bladder to the duodenum. Some researchers have reported a higher prevalence of subclinical hypothyroidism in common bile duct stones which supports a possible relation between low Thyroxine levels and CBD stones . The study aims at finding the prevalence of subclinical hypothyroidism in patients with symptomatic gall stone patients and by treating hypothyroidism is it possible to prevent the progression of gall stone disease.

MATERIALS & METHODS:

A cross-sectional study was done in 100 patients with cholelithiasis attending the outpatient department and admitted in the surgical wards ,over a period of 2 years ,August 2016 to August 2018.

inclusion criteria

All patients with cholelithiasis

exclusion criteria

1. Patients with extremes of age ,80yrs
2. Patients with diagnosed hypothyroidism and on medication.

method of data collection.

Details of cases,full history, clinical examination and symptoms and signs of hypothyroidism were taken. Laboratory wrok up included complete blood picture,thyroid profile(free T3,free T4, and TSH).

RESULTS :

The variables mentioned have been studied among the 100 patients and the results were analysed statistically using Epi.info V3 1.1 software.

Percentage distribution of the sample according to **age.**

Age	Number
<40yr	49
>40yr	51
Mean ±SD	42.88 ± 14.38

Percentage distribution of the sample according to the **gender**.

Gender	Number	Percentage
Male	42	42%
Female	58	58%

Clinical examination:

Variables	Number/Percentage
Pain	93
Dyspepsia	42
Fever	16
Jaundice	0
Neck swelling	5
Hypothyroidism symptoms	0
Hypothyroidism	14
DM	18
HTN	22

Prevalence of Subclinical Hypothyroidism**:** In the study,14% of the patients had subclinical hypothyroidism.

No significant association was found between Diabetes mellitus and Subclinical hypothyroidism.

No significant association between HTN and subclinical hypothyroidism

No significant association between hypothyroidism and obesity.

No significant association was noticed between hypercholesteremia and hypothyroidism.

No significant association noted between smoking and hypothyroidism

No significant association noted between alcohol consumption and

hypothyroidism
Comparison of stone size in Subclinical Hypothyroidism:

According to our study,there is sigificant association between the size of the stone an d hypothyroidism The stone size is larger in patients with hypothyroidism. Multiple stones were found more commonly in patients with Hypothyroidism,but Pvalue is not significant.

CONCLUSION

This study was conducted to explore prevalence of hypothyroidism in patients of cholelithiasis, so that light on relation of hypothyroidism and cholelithiasis could be found. In our study, as expected majority of patients were females as both hypothyroid and cholelithiasis is common in females and most of our patients were in 40 and 50 age group. 14% patients were diagnosed with hypothyroidism, hypothyroid patients were detected on surgery to have multiple stones and most of these stones were cholesterol stones as most common type. As most patients were >40, it can be explained by time needed for stone formation due to effect of increased TSH. This study corroborated earlier studies as mentioned in discussion part, and lead further to understanding relation of hypothyroidism and cholelithiasis. Further large population studies are needed in this direction to compare these findings leading to recommendations for screening for early diagnosis of hypothyroid state at subclinical level by regularly monitoring TSH so that they can be treated at early stages and burden of cholelithiasis thus can be prevented at least in this subgroup.

DISCUSSION

In our study,14 out of 100 patients with cholelithiasis were diagnosed to have subclinical hypothyroidism.Significant association was noted between the Subclinical hypothyroidism and the presence of cholelithiasis. Most of the patients were females but in our study more number of males had subclinical hypothyroidism,although there is no significant association

In our study,it was found that there was significant corelation between the stone size and the subclinical hypothyroidism. Pearson co-efficient was 0.435 between the two,which indicates moderate positive corelation. It implies that as the level of hypothyroidism increases,there is more chance of formation of larger stones and also multiple stones.

All stones in hypothyroidism patients were >1cm and overall 58% stones were >1cm (statically significant P<0.05) 03 out of 12 hypothyroid patients (25%) had single stone while 9 (75%) patients had multiple stones (statistically significant P value) in a study done by Bijendra Singh published in 2018.

The increasing age also increases the chance of cholelithaisis.In our study there was no association between the age and subclinical hypothyroidism.

Obesity,is a well-established risk factor for gallstone disease. In our study cholelithiasis was more seen in obese patients,but not statistically significant.

Hypercholesteremia is a risk factor for formation of gallstones. In hypothyroidism owing to the increased production of cholesterol formation, more cholesterol stones are noted.

In our study,no significant association was noted between the two.

A study done by Henry Volzke in 2005,concluded a significant association between hypothyroidism and gallstone formation.In the study,385 (10.3%) patients out of 3749 patients denovo detected to be hypothyroid.The proportion of cholelithiasis in males and females was 14.4 % and 25.3% respectively.

In a study by Cakir et al,proved that gall bladder motility decreases as the thyroid hormone level decreases ,leading to bile stasis and cholesterol stone formation.

In a study done by Ajdarkosh in 2013 it was observed that hypothyroidism was detected in 10.8% of the control group and in 11.3% of case. The mean total cholesterol levels in cases was higher than the control group.
In a study done by Hueston Wj in 2004 it was observed that the persons meeting the criteria for subclinical hypothyroidism had higher mean cholesterol levels (226 vs 217 mg/dL, P = .003) and rates of elevated cholesterol levels (74.2% vs 63.9%, P = 0.02) than the euthyroid control group, but there were no significant differences in lowdensity lipoprotein (LDL) or high-density lipoprotein (HDL) levels.

A case report was published by Vassilakis JS in 1981,in which disappearance of five radiolucent gallstones was noticed, within six months of carbimazole and thyroxine orally for toxic goiter.

In a study done by Brijendra Singh Raghuwanshi, Sandeep Jain in 2017 at Gandhi Medical College in Bhopal during 2015-16, observed that the most common age group was 41-50 (36%). 12 (24%) out 50 patients were hypothyroid. Out of total 42 females 11(26.19 %) were hypothyroid . All stones in hypothyroidism patients were >1cm and overall 58% stones were >1cm. 03 out of 12 hypothyroidisms (25%) patient had single stones while 9 (75%) patient have multiple stone (statically significant P value<0.05) In hypothyroid cases most stones are of cholesterol type (58%).

In our study,the incidence was 14% and most of the patients were females and the stone size was >1cm in hypothyroid patients.A positive corelation was noticed between the stone size and hypothyroidism.

Another study done by J Vidya Priya and Aswin Saravan kumar,from Tamil Nadu also proved and matched their results with our study. the incidence of subclinical hypothyroidism was 11.4% ,which is close to that of this study (14%) and the incidence is more common in the age group of >45.

In this study, the higher proportion of hypothyroidism in women with cholelithiasis compared to men was mainly due to the earlier symptomatology of gallstone disease in women as well as the higher incidence of thyroid disease in women in general.

In a study done by Yawar Zahoor Watali in 2017,a significant relationship was not found between the cholelithiasis and hypothyroidism. Among the hypothyroid patients the incidence of gall stones was highest among 51-60 years of age. so we recommend that TSH level should be measured for every patient with gallstone disease in this age range.

Abnormalities of lipid metabolism, gallstone disease and gallbladder function Silvana Zanlungo, Attilio Rigotti,et al observed that;the series of studies in humans and mice showing increased serum VLDL-apoB and serum TG concentrations after ablation of the GB. These observations indicate that GB function has an important role in regulating systemic TG metabolism and energy balance. In our study, no significant association was noted between the hypercholesteremia and gallstone disease.

An Epidemiologic Study in a Nonselected Population in France;Caroli-Bosc F.X. et al;showed that age and body surface area were found to be independently correlated with gallbladder volume. Gallbladder volume was significantly increased in subjects over 50 years . There was a positive correlation between gallbladder volume and BSA.

In this study, the presence or absence of gallstones did not significantly affect the gallbladder volume.

In our study,there was no significance between the age and obesity in patients with cholelithiasis

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