

Review Article

Link between hypothyroidism and small intestinal bacterial overgrowth

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ABSTRACT

Altered gastrointestinal (GI) motility is seen in many pathological conditions. Reduced motility is one of the risk factors for development of a small intestinal bacterial overgrowth (SIBO). Hypothyroidism is associated with altered GI motility. The aim of this article was to study the link between hypothyroidism, altered GI motility and development of SIBO. Published literature was reviewed to study the association of altered GI motility, SIBO and hypothyroidism. Altered GI motility leads to SIBO. SIBO is common in patients with hypothyroidism. Patients with chronic GI symptoms in hypothyroidism should be evaluated for the possibility of SIBO. Both antibiotics and probiotics have been studied and found to be effective in management of SIBO.

Key words: Breath test, hypothyroidism, small intestinal bacterial overgrowth

INTRODUCTION

Hypothyroidism is a common endocrine condition with inadequate production of thyroid hormone or suboptimal action of thyroid hormone on the target tissues. Hypothyroidism can either be primary or result of secondary causes. Constipation is typical gastrointestinal (GI) symptoms of hypothyroidism. Hypothyroidism also affects other systems. Systemic involvement affects the cardiovascular system, skin, neurological manifestations, menstrual disturbances in female etc., GI signs and symptoms may be seen due to disturbances in motility.^[1] Motor dysfunction results in altered motility and transit time thyroid disease.^[2] This article reviewed the published literature to study association link between hypothyroidism, altered GI motility and development of a small intestinal bacterial overgrowth (SIBO).

HYPOTHYROIDISM AND INTESTINAL DYSMOTILITY

Hypothyroidism prominently decreases the gastroesophageal motility and hence it is recommended to evaluate thyroid functions in admitted patients complaining dyspepsia. In order to evaluate whether there is any change in gastroesophageal motility due to hypothyroidism, Yaylali *et al.*^[3] studied 30 female patients with primary hypothyroidism with 10 healthy females as the control group. Motility disturbances in the form of significantly higher mean esophageal transit time (52.56 s vs. 24.3 s $P = 0.02$) and gastric emptying time (49.06 s vs. 30.4 s $P = 0.01$) were seen in patients with hypothyroidism compared with the control group.

The results proved that hypothyroidism reduces esophageal and gastric motor activity. Motility disturbances in hypothyroidism can lead to GI dysfunction.

INTESTINAL DYSMOTILITY AND SIBO

In healthy individuals normal small GI motility prevents the overgrowth of bacterial microorganisms.^[4] SIBO is associated with the increase in level of microorganisms above 10^6 colony-forming units/ml in intestinal aspirate. This may be associated with colonic-type of bacteria in the small intestine.^[5] SIBO occurs when mechanisms

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controlling enteric bacterial growth are disturbed. One of the most common mechanisms is the small intestinal dysmotility. Thus small intestinal dysmotility constitutes one of the risk factor for development of SIBO.^[6-8] Other risk factors include failure of the gastric acid barrier, anatomic alterations or impaired immunity.^[7] Irritable bowel syndrome (IBS), a functional GI disorder^[9] is characterized by altered GI motility.^[10] Most of IBS patients have one of symptom of bloating regardless of their predominant complaint. SIBO could be the cause of bloating in IBS. Peralta *et al.*^[10] demonstrated the presence of SIBO in 56% of patients based on positive lactose breath test results. SIBO may lead to symptoms such as abdominal bloating and discomfort and diarrhea in IBS.

SIBO IN HYPOTHYROIDISM

It has been reported that SIBO may be present in more than half of patients with hypothyroidism.^[11] Lauritano *et al.*^[11] studied 90 subjects (hypothyroidism [$n = 50$] and control [$n = 40$]) and found that significantly higher numbers of patients (54%) with hypothyroidism have SIBO as demonstrated with positive glucose breath test compared with the control group (5%) ($P < 0.001$).^[11]

Constipation is common in hypothyroid patients, but diarrhea is rarely reported. Goldin and Wengrower^[12] reported a young woman with hypothyroidism presenting with predominant symptom of chronic diarrhea. Two points strongly predict the presence of SIBO in such patients; positive hydrogen breath test and positive response to antibiotic. In this patient, both fasting hydrogen breath test was positive and antibiotic treatment was found to be successful. Bacterial overgrowth because of hypomotility may be the possible cause of diarrhea in such patients.^[12]

GI hypomotility in hypothyroidism may promote bacterial overgrowth leading to chronic GI symptoms. SIBO is a common cause of chronic diarrhea.^[13] In the literature, not many studies are found on the prevalence of SIBO in hypothyroidism, but the association of hypothyroidism and small bacterial overgrowth does exist. Hence, patients with chronic GI problems in hypothyroidism should be evaluated for SIBO.

MANAGEMENT OF SIBO

Antibiotic and some probiotics have been shown to be useful in the management of SIBO. Peralta *et al.*^[10] performed lactose breath test in 97 patients with IBS. Out of these, 56% patients who showed positive breath test were treated with Rifaximin 1200 mg daily for 7 days. One

week treatment with Rifaximin resulted in normalization of breath test results in about 50% of patients. There was also significantly improvement in the symptoms.

A study with probiotic *Bacillus clausii* also showed promising results in SIBO. Gabrielli *et al.*^[14] studied 40 patients with abnormal glucose breath test. These patients were treated with *B. clausii* 2×10^9 spores, 3 times a day for 1 month. Breath test was repeated 1 month after the end of therapy. In 19 patients (47%), the breath test was normal. No patient withdrew from treatment hence no dropout was reported.^[14]

In another study, 23 patients with SIBO were treated with Rifaximin 1200 mg/day for 7 days and followed by treatment with probiotics. This treatment resulted in normalization of breath test result in 82.6% of patients.^[15] Thus, both antibiotic and certain probiotics have a place in the management of SIBO.

CONCLUSION

GI symptoms may be ignored in hypothyroidism due to other systemic symptoms of involving cardiovascular, neuromuscular or ophthalmic systems. GI motility is disturbed in hypothyroidism, which can lead to SIBO. SIBO may be responsible for chronic GI symptoms in these patients. It is prudent to evaluate the possibility of SIBO in patients with chronic GI symptoms in hypothyroidism.

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