



Incidence of Ulcerative Colitis (UC) and Crohn's Disease in Thyroid Disorders

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ABSTRACT

Aim: In patients with ulcerative colitis (UC) and Crohn's disease (CD), an increase in thyroid dysfunction has been reported compared to normal people. This study was held to assess the thyroid disease prevalence in the inflammatory bowel disease patients group. **Study Design:** A retrospective study. **Place and Duration:** In the Medicine Department of Isra University Hospital, Hyderabad for one-year duration from March 2018 to March 2019. **Methods:** Total of 155 patients were included (120 UC, 35 CDs) and 63 healthy control subjects. Patients with free T3 (FT3), T4 (FT4), anti-TPO serum and TSH were evaluated retrospectively and with the group of control were compared. These patients were examined using nuclear imaging (scintigraphy) and thyroid ultrasound. **Results:** 42.9 ± 12.4 years was the average age of patients with IBD (76 women). The control group consisted of 42 women and 40.9 ± 12.1 years was the average age. In 18 patients (9.5%, 8 women, 6 men) out of 155 patients with inflammatory bowel disease, thyroid disease was diagnosed. The thyroid disorders frequency was higher in IBD group than in the group of control (18/155 vs. 1/63, $p=0.042$). There was no substantial dissimilarity in the frequency of thyroid orders in cases of CD and UC (5/40 vs. 13/115, $p=0.912$). In 4 (2.7%) IBD patients, Hashimoto's thyroiditis were noted. **Conclusion:** According to many studies issued in the literature, we have noted a greater fraction of thyroid disease in inflammatory bowel disease patients.

Keywords: Thyroid disease, Crohn's disease, Ulcerative colitis

INTRODUCTION

Inflammatory bowel diseases (IBD), ulcerative colitis (UC) and Crohn's disease (CD) are syndromes initiated by deregulation of the patients' immune system with the genomic disposition and categorized by chronic inflammation with periods of remission and relapse [1-3]. Ulcerative colitis and Crohn's disease are related with an extensive series of extraintestinal impediments that affect the sequence and treatment of the disease [4,5]. Though inflammatory bowel diseases extra-intestinal difficulties including ocular, rheumatological, hepatobiliary and dermatological complications are well known, data on the association between thyroid disease and inflammatory bowel diseases have not been fully proven [6]. Epidemiological studies have shown a higher incidence of inflammatory bowel diseases and hyperthyroidism [7]. In the earlier analysis, the correlation between thyroid disorders and ulcerative colitis is well known. The incidence of thyroid disorders in patients with Crohn's disease and ulcerative colitis is higher than in the normal population [7]. The incidence of thyrotoxicosis in ulcerative colitis patients ranges from 0.8% to 3.7%. However, the percentage of thyroid disorders in CDs patients was included in fewer studies than in patients with UC [8]. The aim of this study was to assess the incidence of thyroid disease in patients with UC and CD.

MATERIALS AND METHODS

This Retrospective study was conducted in the Medicine Department of Isra University Hospital, Hyderabad for one-year duration from March 2018 to March 2019. A total of 155 patients (120 UC, 35 CDs) were selected in this retrospective study with inflammatory bowel disease. All patients were diagnosed as inflammatory bowel disease

according to the laboratory, clinical, histopathological and endoscopic findings. All patients' medical records were analyzed for IBD disease types, demographic profiles, and localization as well as laboratory parameters, especially T4, T3, anti-TPO levels and TSH. Patients were evaluated retrospectively by age, sex, UC or CD location. The localization of the disease was proctite, pancolitis and extensive type in UC patients and ileal involvement, left-sided colon involvement, ileocolonic and colon envelopment in Crohn's disease patients. Free T3 (FT3), T4 (FT4), anti-TPO levels and TSH were investigated in both patients groups and controls. Based on TSH levels and thyroid hormone profile, positive anti-thyroid antibodies; hypothyroidism, hyperthyroidism, subclinical hypothyroidism, autoimmune thyroiditis, and subclinical hyperthyroidism has been diagnosed. These cases were examined using nuclear imaging (scintigraphy) and thyroid ultrasound. Serum-free T3 (FT3), T4, anti-TPO levels and TSH were checked by radioimmunoassay. Normal hormone levels are ft3: 7-16 pikomol/L, ft4: 7-16 pikomol/L, TSH: 0.34 to 5.6 micro IU/ml and anti-TPO: 0 to 9 IU/ml.

Using SPSS; version 18.0, Data was analyzed. Fisher's exact test was applied where suitable for statistical comparison. To compare quantitative variables, Student's t-test was applied. Results are stated as a percentage and mean \pm SD. p-value less than 0.05 was measured substantial.

RESULTS

Patient disease localization and demographic characteristics are given in Tables 1 and 2. 42.9 ± 12.4 years was the average age of patients with IBD.

Table 1 The patient's baseline characteristics

Variables	IBD Patients	CD Patients	UC Patients	Control Group
No.%	155	35	120	63
Mean age in years	42.9 ± 12.4	41.9 ± 13	43.6 ± 11.5	40.9 ± 12.1
Gender	73 male	55 male	21 males	21 males
	82 females	65 females	14 females	41 females

There was no statistically significant alteration between gender distribution ($p=0.136$), average age ($p=0.357$) and in a group of control.

Table 2 Distribution of patients

Localization	Ulcerative Colitis (n=120)	Crohn's Disease (n=35)
	Upper GI (0%)	Pancolitis (14.1%)
	Ileocolon (38%)	Distal UC (28.2%)
	Colon (0%)	Extensive UC (12.9%)
	Terminal Ileum (62%)	Left-sided UC (44.7%)

Thyroid hormone and antibody levels of control and patient group are given in Table 3. When considering mean levels of TSH, ft3 and ft4 no substantial variance was perceived among the control group and inflammatory bowel disease patients group.

Table 3 Thyroid hormone and antibody levels of control and patient group

Patient Group	TSH(micro IU/ml)	Anti TPO (IU/ml)	FreeT3 (picomol/L)	FreeT4 (picomol/L)
CD	2.7 ± 5.59	14.07 ± 28.35	4.3 ± 0.89	14.46 ± 3.81
UC	1.8 ± 2.13	14.2 ± 30.25	4.5 ± 1.42	14.3 ± 4.015
IBD	2.1 ± 3.6	14.1 ± 29.1	4.4 ± 1.27	14.4 ± 4.01
Control Group	4 ± 15.3	22.4 ± 82.6	4.8 ± 0.85	15.04 ± 2.9

In 16 patients, Thyroid disorder was noted (4 CD and 12 UC) out of 155 patients with IBD. The frequency and prevalence of thyroid disorders in CD, UC and IBD patients are given in Table 4.

Table 4 The frequency and prevalence of thyroid disorders in CD, UC and IBD patients

Thyroid Disorders	CD (n=35)	UC (n=120)	IBD (n=155)	Control Group (n=63)
Hypothyroidism	0%	0%	2 (1.3%)	0%
Hyperthyroidism	0%	7 (5.8%)	7 (4.6%)	0%
Thyroid Disease	4 (11.35%)	13 (10.8%)	16 (10.3%)	2 (3.17%)
Thyroiditis	0%	5 (4.2%)	5 (3.2%)	1 (1.6%)
Subclinical Hyperthyroidism	4 (11.35%)	3 (2.5%)	7 (4.6%)	0%
Subclinical Hypothyroidism	0%	0%	0%	0%

The thyroid disorders prevalence in IBD patients is higher than in the group of control (16/155 vs. 2/63, $p=0.042$). Hyperthyroidism was noted in 7 patients and subclinical hyperthyroidism in 3 patients (7/120, 5.8% and 3/120, 2.5% in UC). Regarding patients with CD, three cases were diagnosed with subclinical hyperthyroidism. There was no statistically substantial variance in the frequency of thyroid disorders among patients with CD and UC (4/35 vs. 13/120, $p=0.912$). In all IBD patients, Hashimoto's thyroiditis was renowned in 4 (2.7%) all were with UC. In cases of Hashimoto's thyroiditis, one had hypothyroidism and thyroid hormone management was initiated. Rheumatoid arthritis was eminent in all Hashimoto's thyroiditis patients. Only 1 patient with thyroid disorders in the control group had Hashimoto's thyroiditis. Hashimoto's thyroiditis prevalence was the same in the control group and IBD patients (1.5% vs. 2.7%, $p=0.596$).

DISCUSSION

A total of 155 patients (120 UC, 35 CDs) with IBD participated in this study. The thyroid disease prevalence was greater than in the control group (9.5% and 1.5%). In 9.7% of UC cases have thyroid disorders and Crohn's disease in 9.0% of patients [9,10]. The frequency of hyperthyroidism and in subclinical form was greater in IBD patients than in the group of control. Though, the incidence of thyroiditis and hypothyroidism was the same as the group of control (1.5% vs. 2.7%, $p=0.596$). Though, no substantial alteration was noted in patients with CD and UC [11]. Various analysis reports that the incidence of thyroid disorder in inflammatory bowel diseases patients is similar to the normal inhabitants [12]. In a population study of 8,072 IBD patients in Canada, the 0.23% incidence of thyroiditis in UC patients was noted, 0.20% in CD patients (0.15% to 0.20% in the control group). In this analysis, thyroid disease incidence was the same as the normal population [13]. In a study of 25 ulcerative colitis patients in our country, the incidence of thyroid disease was similar to the control group. In an Italian study of 162 patients with UC, thyroid disorders (hyperthyroidism and hypothyroidism) were reported in 2.5%. In the same geographical region, this rate was 7.5% in the normal population [14]. Thyroid disease has only been reported in a partial amount with UC cases and limited in patients with CD. Some analysis reports a reduction in tT4 levels in Crohn's disease patients. In addition, these studies showed a higher percentage of anti-thyroid microsome/peroxidase in IBD patients. Laboratory investigations indicated hyperthyroidism in ulcerative colitis patients. Some benefits and disadvantages of this analysis are as follows: In this study, patients with CD who were less studied in the analysis are also assessed together with patients of UC [15]. The incidence of thyroid disease noted in patients of inflammatory bowel diseases is divided into groups according to thyroid disease (hyperthyroidism, hypothyroidism, thyroiditis, subclinical hypothyroidism, and hyperthyroidism). The patient's number in this area was large enough and compared with the control group. The study's weakness was that it was a retrospective analysis and no populace assessment was performed.

CONCLUSION

In summary, although some literature has revealed that thyroid disease in patients of inflammatory bowel diseases is similar to the normal population, we have found that the percentage of thyroid disorders in IBD patients is higher than in normal people. Laboratory tests are required for hyperthyroidism in ulcerative colitis patients in whom the thyroid

treatment-resistant and/or distended thyroid gland is noted. Early analysis of thyroid disorders is significant because thyroid disease can aggravate the course and IBD signs.

DECLARATIONS

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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