ORIGINAL PAPERS

Adv Clin Exp Med 2012, **21**, 1, 43–46
ISSN 1899-5276

Katarzyna Neubauer, Barbara Woźniak-Stolarska

Ultrasonographic Assessment of the Thyroid Gland Structure in Inflammatory Bowel Disease Patients

Ultrasonograficzna ocena morfologii gruczołu tarczowego u pacjentów z nieswoistymi zapaleniami jelit

Department of Gastroenterology and Hepatology, Wroclaw Medical University, Poland

Abstract

Background. The etiopathogenesis of inflammatory bowel disease (IBD), encompassing Crohn's disease (CD) and ulcerative colitis (UC), is still not fully elucidated and seems to be multifactorial. It has been suggested that genetic, immunological and environmental factors participate in IBD development. IBD extraintestinal manifestations include rheumatic, metabolic, dermatologic, ophthalmologic, hepatobiliary, pancreatic, urologic, pulmonary, neurological, hematological and thromboembolic complications. Thyroid gland diseases have not been confirmed as extraintestinal manifestations of IBD. However, it is known that some thyroid diseases share an immunological background with IBD, and that dysfunction of the thyroid gland may induce gastrointestinal symptoms. Ultrasound examination is the gold standard for evaluation of thyroid gland morphology.
Objectives. This study was designed to assess the prevalence of abnormalities in the structure of the thyroid gland in IBD patients and to compare it to the control group.
Material and Methods. The study group consisted of 199 consecutive IBD patients (80 CD patients and 119 UC patients) hospitalized at the Department of Gastroenterology and Hepatology of Wroclaw Medical University (Poland). The control group consisted of 42 healthy volunteers and patients with functional gastrointestinal disorders.
Results. The most common finding in the ultrasound examination in IBD patients were tumors. Tumors, which were smaller than or equal to 10 mm were present in 11.5% of IBD patients; and tumors larger than 10 mm were present in 13.1%. These results show that small tumors (less than 10 mm in diameter) of the thyroid gland are more frequent among patients with CD and UC compared to the control group ($p = 0.0001$ and $p = 0.001$, respectively). Additionally, enlargement of the thyroid gland occurs more often in UC patients compared to the control group ($p = 0.003$). There was no difference in the frequency of thyroid abnormalities between UC and CD patients.
Conclusions. In patients with inflammatory bowel diseases focal lesions relating to tumors of the thyroid gland are more common than in the control group. In patients with ulcerative colitis enlargement of the thyroid gland is more frequent than in the control group. Initial assessments of IBD patients should include ultrasound examinations of the thyroid gland (**Adv Clin Exp Med 2012, 21, 1, 43–46**).

Key words: inflammatory bowel disease, ulcerative colitis, Crohn's disease, thyroid gland diseases.

Streszczenie

Wprowadzenie. Etiopatogeneza nieswoistych zapaleń jelit (IBD – *inflammatory bowel disease*), przewlekłych chorób przewodu pokarmowego, do których zalicza się chorobę Leśniowskiego – Crohna (CD – *Crohn's disease*) i wrzodziejące zapalenie jelita grubego (UC – *ulcerative colitis*) nie jest w pełni wyjaśniona i obecnie wydaje się, że jest wieloczynnikowa. Uważa się, że w rozwoju IBD biorą udział czynniki genetyczne, immunologiczne i środowiskowe. Pozajelitowe manifestacje IBD obejmują powikłania: reumatologiczne, metaboliczne, dermatologiczne, okulistyczne, wątrobowe, żółciowe, trzustkowe, urologiczne, płucne, neurologiczne, hematologiczne i zatorowo-zakrzepowe. Problem chorób gruczołu tarczowego jako pozajelitowej manifestacji IBD nie został jednoznacznie potwierdzony. Z drugiej strony niektóre choroby tarczycy mają wspólne z IBD podłoże immunologiczne a dysfunkcja tarczycy może powodować objawy ze strony przewodu pokarmowego. Badanie ultrasonograficzne jest złotym standardem w ocenie morfologii gruczołu tarczowego.
Cel pracy. Ocena częstości występowania nieprawidłowości w budowie gruczołu tarczowego u pacjentów z IBD i porównanie jej z grupą kontrolną.

Materiał i metody. Grupę badaną stanowiło 199 kolejnych pacjentów z IBD (80 pacjentów z CD i 119 z UC) hospitalizowanych w Klinice Gastroenterologii i Hepatologii AM we Wrocławiu. Grupę kontrolną stanowiło 42 zdrowych ochotników i pacjentów z czynnościowymi zaburzeniami przewodu pokarmowego.
Wyniki. Najczęstszą zmianą w badaniu ultrasonograficznym pacjentów z IBD były guzki. Guzki o średnicy równej lub mniejszej niż 10 mm stwierdzono u 11,5% pacjentów z IBD, a guzki o średnicy większej niż 10 mm u 13,1% pacjentów z IBD. Na podstawie uzyskanych wyników stwierdzono, że małe guzki gruczołu tarczowego (średnica mniejsza niż 10 mm) występują częściej u pacjentów z UC i CD w porównaniu z grupą kontrolną (p = 0,0001 i p = 0,001). Poza tym powiększenie gruczołu tarczowego występuje częściej u pacjentów z UC w porównaniu z grupą kontrolną (p = 0,003). Nie wykazano różnicy w częstości występowania nieprawidłowości w badaniu ultrasonograficznym gruczołu tarczowego u pacjentów z UC i CD.
Wnioski. Zmiany ogniskowe gruczołu tarczowego o charakterze guzków są częstsze u pacjentów z nieswoistymi zapaleniami jelit w porównaniu z grupą kontrolną. U pacjentów z wrzodziejącym zapaleniem jelita grubego powiększenie gruczołu tarczowego jest częstsze w porównaniu z grupą kontrolną. Wyniki niniejszego badania sugerują, że wstępna ocena pacjentów z IBD powinna obejmować badanie ultrasonograficzne gruczołu tarczowego (**Adv Clin Exp Med 2012, 21, 1, 43–46**).

Słowa kluczowe: nieswoiste zapalenia jelit, wrzodziejące zapalenie jelita grubego, choroba Leśniowskiego-Crohna, choroby tarczycy.

The etiopathogenesis of inflammatory bowel disease (IBD), chronic diseases of the gastrointestinal tract encompassing Crohn's disease (CD) and ulcerative colitis (UC), is still not fully elucidated and seems to be multifactorial. It has been suggested that genetic, immunological and environmental factors participate in IBD development. Clinical manifestations of IBD depend generally on the disease activity, location and extent in the gastrointestinal tract. IBDs are associated with a decreased quality of life, and in addition, extraintestinal manifestations constitute significant problems in IBD patients [1]. Extraintestinal IBD manifestations include rheumatic, metabolic, dermatologic, ophthalmologic, hepatobiliary, pancreatic, urologic, pulmonary, neurological, hematological and thromboembolic complications [2]. It is estimated that 20% to 35% of IBD patients have at least one of the extraintestinal symptoms [3, 4].

The status of thyroid gland diseases as extraintestinal manifestations of IBD has not been fully clarified. However, it is known that some thyroid diseases share an immunological background with IBD. Thyroid diseases have been found to be one of the most common non-IBD immune-mediated diseases among patients with primary sclerosing cholangitis, which is an extraintestinal IBD manifestation [5]. Additionally, thyroid gland dysfunction may induce gastrointestinal symptoms and influence clinical manifestations of ulcerative colitis and Crohn's disease. As reviewed by Daher et al., thyreotoxicosis was reported in 3.8% of UC patients. Moreover, although a common pathogenesis still needs to be clarified, an association between Grave's disease and IBD has also been reported [6].

Ultrasound examinations and hormone tests are basic tools in the diagnostic management of thyroid gland diseases. Ultrasound examination is the gold standard for evaluation of thyroid gland morphology.

The study was designed to assess the prevalence of abnormalities in the structure of the thyroid gland in IBD patients and to compare it to the control group.

Material and Methods

The study group consisted of 199 consecutive IBD patients: 80 CD patients (30 females, 50 males, age 18–87 years, mean age 39.52 years) and 119 UC patients (59 females, 60 males, age 19–89 years, mean age 43.31 years) hospitalized at Wroclaw Medical University's Department of Gastroenterology and Hepatology (Wrocław, Poland). The control group consisted of 42 healthy volunteers and patients with functional gastrointestinal disorders (28 females, 14 males, age 23–81 years, mean age 53.88 years). For the statistical analysis, a chi-square test and Fisher's test were applied. A p value < 0.05 was considered statistically significant.

The study was approved by the Commission of Bioethics at Wroclaw Medical University.

Results

The most common focal lesions found in the thyroid glands of IBD patients were tumors: 13.1% had tumors larger than 10 mm in diameter, and 11.5% had tumors smaller than or equal to 10 mm. The type and frequency of thyroid ultrasound findings in the study group and the control group are presented in Table 1. Enlargement of the thyroid gland was diagnosed when the volume of the gland was larger than 18 ml in women and 25 ml in men.

There was no difference between CD patients and UC patients in the prevalence of tumors, cysts, enlargement of the thyroid gland and the presence of calcifications. Small tumors (≤ 10 mm) occurred

Table 1. Type and frequency of thyroid abnormalities in ultrasound examinations in IBD patients and in the control group.

Tabela 1. Rodzaj i częstość występowania nieprawidłowości gruczołu tarczowego w badaniu ultrasonograficznym u pacjentów z IBD i w grupie kontrolnej

Finding (Zmiana)	CD (%)	UC (%)	Control group (Grupa kontrolna) %	p CD vs UC	p CD vs control group (CD *vs* grupa kontrolna)	p UC vs control group (UC *vs* grupa kontrolna)
Tumor ≤ 10 mm (Guz ≤ 10 mm)	9 (11.2)	14 (11.8)	1 (2.4)	0.55	0.0001*	0.001
Tumor > 10 mm (Guz > 10 mm)	6 (7.5)	20 (16.8)	10 (23.8)	0.39	0.83	0.07
Cyst (Torbiel)	5 (6.2)	12 (10.8)	19 (45.2)	1.00	0.27	0.21
Enlargement of the thyroid gland (Powiększenie gruczołu tarczowego)	7 (8.7)	13 (10.9)	30 (71.4)	0.94	0.06	0.003
Calcification (Zwapnienie)	2 (2.5)	5 (4.2)	7 (16.7)	1*	0.72*	0.74

UC – ulcerative colitis
UC – wrzodziejące zapalenie jelita grubego.

CD – Crohn's disease
CD – choroba Leśniowskiego-Crohna.

* Fisher's test.
* Test Fishera.

more often in CD patients than in the control group. The prevalence of tumors > 10 mm, cysts, enlargement of the thyroid gland and calcifications did not differ between CD patients and the control group (Table 1).

Small tumors (≤ 10 mm) and enlargement of the thyroid gland occurred more often in UC patients than in the control group. The prevalence of tumors > 10 mm, cysts, and calcifications did not differ between CD patients and the control group (Table 1).

Discussion

The results of the study suggest that some morphological abnormalities of the thyroid gland may occur more often in patients with inflammatory bowel disease. The most common focal lesions found in IBD patients in the study are tumors: 13.1% of the patients had tumors larger than 10 mm in diameter, and 11.5% had tumors smaller than 10 mm. Small tumors occur more often in IBD patients as compared to the control group. Additionally, enlargement of the thyroid gland is more frequent in ulcerative colitis patients as compared to the control group.

The question of coexisting thyroid gland diseases and inflammatory bowel diseases has not been fully elucidated or systematically studied. Descriptions in the literature mainly have the character of the case reports, as the coexistence of autoimmune thyroid diseases and Crohn's disease is considered to be rare [7, 8]. Pachiadakis et al. reported a case of simultaneous onset of hyperthyreoidism and Crohn's disease [9]. Bank et al. described a case of autoimmune thyroiditis in a Crohn's disease patient with beta-thalassemia [10]. Inokuchi et al. reported two cases of autoimmune thyroid disease (Graves' disease and Hashimoto thyroiditis) in patients with Crohn's disease [11]. On the other hand, as cited by Bonapace et al., it has been shown that thyroid diseases occur two to four times more often among UC patients than in healthy subjects [12]. Additionally there are case reports describing papillary thyroid carcinoma in UC patients [13].

An Italian study reported increase in the volume of thyroid gland and prevalence of anti-thyroglobulin and anti-thyroid peroxidase antibodies in IBD patients compared to healthy subjects; however, the study was limited to a small number of patients (14 UC patients and 27 CD patients) [14]. In the current study, encompassing a larger number of patients, enlargement of thyroid gland

was more common in UC patients as compared to the control group.

The current study indicates that diseases of thyroid gland may be extraintestinal manifestations of inflammatory bowel diseases. As dysfunction of thyroid gland may influence clinical manifestations of ulcerative colitis and Crohn's disease, further studies – including testing of thyroid gland function and the presence of autoimmunological disorders – are required. Additionally, it seems appropriate to design a comfortable, noninvasive algorithm for evaluating the thyroid gland in IBD patients, using a commonly available, safe and effective visualizing method: Initial assessments of IBD patients should include ultrasound examinations of the thyroid gland.

References

[1] **Neubauer K, Arlukiewicz A, Paradowski L:** Quality of life in inflammatory bowel disease. Adv Clin Exp Med 2009, 18, 79–83.
[2] **Gionchetti P:** Extraintestinal manifestations and complications in inflammatory bowel diseases. World J Gastroenterol 2006, 12, 4819–4831.
[3] **Kosiara M, Łapińska J, Semianów-Wejchert J, Paradowski L:** Objawy pozajelitowe nieswoistych zapaleń jelit. Gastroenterol Pol 2009, 16, 475–480.
[4] **Cosnes J, Gower-Rousseau C, Seksik P, Cortot A:** Epidemiology and natural history of inflammatory bowel disease. Gastroenterology 2011, 140, 1785–1794.
[5] **Lamberts LE, Janse M, Haagsma EB, van den Berg AP, Weersma RK:** Immune-mediated diseases in primary sclerosing cholangitis. Dig Liver Dis. 2011 Jun 21.
[6] **Daher R, Yazbeck T, Jaoude JB, Abboud:** Consequences of dysthyroidism on the digestive tract and viscera. World J Gastroenterol 2009, 15, 2834–2838.
[7] **Shah S, Peppercorn M, Pallotta J:** Autoimmune (Hashimoto`s) thyroiditis associated with Crohn`s disease. J Clin Gastroenterol 1998, 26, 117–120.
[8] **Kettaneh A, Prevot S, Biaggi A, Stirnemann J, Fain O, Hocqueoloux L, Mouas H, Levy V-G, Thomas M:** Hyperthyroidism in two patients with Crohn`s disease and Takayasu arteritis. Scand J Gastroenterol 2003, 38, 901–903.
[9] **Pachiadakis I, Nakos A, Tatsi P, Moschos J, Milias S, Nikolopoulos P, Balaris C, Apostolidis D, Zezos P:** Simultaneous occurrence of hyperthyroidism and fistulizing Crohn's disease complicated with intra-abdominal fistulas and abscess: a case report and review of the literature. Cases J 2009, 2, 8541.
[10] **Bank I, Busari JO:** Crohn's disease, autoimmune thyroiditis, and beta-thalassemia trait in an adolescent: an unusual combination of diseases. Eur J Pediatr 2008, 167, 1343–1346.
[11] **Inokuchi T, Moriwaki Y, Takahashi S, Tsutsumi Z, Ka T, Yamamto T:** Autoimmune Thyroid Disease (Graves' Disease and Hashimoto's Thyroiditis) in Two Patients with Crohn's Disease: Case Reports and Literature Review. Int Med 2005, 44, 303–306.
[12] **Bonapace ES, Srinivasan R:** Simultaneous occurrence of inflammatory bowel disease and thyroid disease. Am J Gastroenterol 2001, 96, 1925–1926.
[13] **Evgenikos N, Stephen JG:** Papillary thyroid carcinoma associated with ulcerative colitis. Postgrad Med J 1996, 72, 621–622.
[14] **Messina G, Viceconti N, Trinti B:** The clinical and echographic assessment of thyroid function and structure in patients with a chronic inflammatory intestinal disease. Recenti Prog Med 1999, 90, 13–16.

Address for correspondence:

Katarzyna Neubauer
Department of Gastroenterology and Hepatology
Wroclaw Medical University
Borowska 213
50-556 Wrocław, Poland
Tel.: +48 71 322 21 20
E-mail: gastro@gastro.am.wroc.pl

Conflict of interest: None declared

Received: 5.09.2011
Revised: 3.10.2011
Accepted: 12.01.2012