

## Concomitant Graves' Disease and Crohn's Disease: Does a Link Exist?

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### Abstract

The coexistence of Crohn's disease (CD) and Graves' disease (GD), is uncommon although both conditions involve the autoimmune process. The aim of this report was to review the English and French-language literature since 1999, on cases of concomitant Crohn's disease (CD) and Graves' disease (GD). We analyzed the following previous five case reports of concomitant CD and GD, in addition to a new case treated in our department. Some immunological processes are suggested to be implicated in the pathogenesis of this association; however, the exact mechanism remains unclear. Clinicians should take into consideration the impact of the GD during the CD and vice versa.

**Keywords:** crohn's disease, graves' disease, Basedow's disease, hyperthyroidism, iodine 131.

### Introduction

Crohn disease (CD) is a form of inflammatory bowel disease (IBD) that is characterized by intestinal inflammation that may result from a combination of multiple factors such as environmental or immunological factors [1]. In Saudi Arabia, the incidence of CD has been intensely increasing reaching 6.72/100,000 population [2]. Extraintestinal manifestations include rheumatic, metabolic, dermatologic, ophthalmologic, hepatobiliary, pancreatic, urologic, pulmonary, neurological, hematological and thromboembolic during the CD course is well known, however the coexistence of CD and Grave's disease (GD) has not been well documented [1-3], as to date,

only few literature reviews of cases of GD coexisting with CD have been reported, and still uncertain whether such association is due to a specific reason or a coincidence [4-7]. Some immunological processes are suggested to be implicated in the pathogenesis of this association; however, the exact mechanism remains unclear [3-7]. Herein, we report the case of a young Saudi lady developing Grave's disease three years after being diagnosed with CD disease, and we conducted a literature search and review to evaluate such cases of concomitant GD and CD, from 1999 to 2020.

### Case Report

A 30-year-old Saudi lady, with unremarkable family history, nonsmoker was referred to the Department of Gastroenterology, under a diagnosis of Crohn's disease. She was medically treated. During the follow, the disease exhibited repeated episodes of remission and exacerbation. Three years after, the patient complained of anterior neck pain and palpitation. The physical examination

showed mild swelling of the thyroid gland, while laboratory findings showed hyperthyroidism: Serum free T4 was 8.7 ng/dl (normal value: 1.0–1.7 ng/dl), TSH was 0.001 IU/ml (normal value: 0.436–3.78 IU/ml). the antithyroid antibodies was favor Graves's disease. The patient was referred to our department of nuclear medicine at king Fahd medical city, for radioiodine therapy by iodine 131 for her GD.

### Discussion

We performed a review of the English and French literature regarding the coexistence of GD and CD, from 1999 to 2020. We used PubMed and science direct for the English and French literature, respectively. The characteristics of the six known reported cases of concomitant CD and GD are summarized in the (table 1) [4-7]. Of the six cases of concomitant CD and GD that were identified in this review (including our case), Four cases were male and two were female. The diagnosis of the concomitant diseases was made between the ages of 14 and 53

years. In three cases (including our case), CD was diagnosed before the development of GD and the interval between the diagnoses of the primary and concomitant diseases was 2–16 years [6,7]. In two cases, each disease was diagnosed simultaneously [4,5]. However, in one case, the GD is preceding the development of CD, which was very rare. As the best of our knowledge this was the only case of GD preceding CD reported in the literature [7].

**Table 1:** Summary of Cases with Coexisting Crohn’s Disease and Grave’s disease

Case	Year	Gender	Age at diagnosis of CD	Age at diagnosis of GD	CD is prior to GD	References
1	1999	M	14	14	simultaneously	[4]
2	2004	M	20	20	simultaneously	[5]
3	2005	F	22	38	+	[6]
4	2007	M	53	55	+	[7]
5	2007	M	52	44	-	[7]
6	2020	F	25	28	+	<b>Our case</b>

F: female; M: male, +: CD is prior to GD; -: GD is prior to CD.

Although some cases of GD coexisting with CD have been reported since 1999 [4-7], it is still unclear whether such association is due to a specific reason or a simple coincidence [6]. The authors suggested some immunological processes to be contributed to the mechanisms of this association, however, the exact pathogenesis remains unclear [4-7]. We postulated also a genetic or environmental pathogenesis may have implicated to the coexistence of these diseases [6].

In some papers, genetic factors were suggested, because the familial occurrence of both diseases is well known [6]. However, in some other publications the family history was negative for Crohn’s disease or thyroid disease in reviewed cases [7]. As for environmental factors, it is well known that smoking is a serious risk factor for Crohn’s disease [1-6]. At the same time, the effect of smoking on thyroid disorders is still controversial, since various environmental and genetic factors are incriminated in the development of thyroid dysfunctions [6].

### Conclusion

At present, there is no clear explanation for the coexistence of GD and CD, therefore, accumulation and analysis of such cases is necessary to clarify the underlying etiology of those associations. Physicians

### References

- Shizuma T (2016) Concomitant Thyroid Disorders and Inflammatory Bowel Disease: A Literature Review. *Biomed Res Int* 2016: 5187061.
- Article R (2019) Inflammatory Bowel Disease in Saudi Arabia: Challenges and Perspectives. *EC Microbiology* 15.3 (2019): 217-226.
- Naeem N, Arshad I, Zaman S, Khan Z (2020) Incidence of Ulcerative Colitis (UC) and Crohn’s Disease in Thyroid Disorders. *Int J Med Res Health Sci* 9(1): 63-66.
- R. Gómez, A. K. Shetty, A. Vargas, A H Tilton, J D England, et al. (1999) “Chronic inflammatory demyelinating polyradiculoneuropathy and Graves’ disease in an adolescent with Crohn’s disease,” *J Pediatr Gastroenterol Nutr* 29(1): 91-94.
- K. Kanda, Y. Okada, M. Nakai, E. Morita, and Y. Tanaka,

et al revealed that there is association between cigarette smoking and autoimmune thyroid disease even when the effect of genetic factors is eliminated, using twin pairs discordant for thyroid disease [8]. Thus, smoking appears to be a double risk factor for GD and Crohn’s disease [6]. However, taking into consideration that all the patient collected in the table 1, were non-smokers, smoking seems not considered to be a contributory factor in our study. The same findings were confirmed by T. Inokuchi et al [6]. As for immune factors, it has become recognized that Th1/Th2 balance controls the immune system. The autoimmune thyroiditis and Graves’ disease are considered to be a Th2-type cytokine profile [7,9] similarly, to ulcerative colitis, which is also a Th2-cytokine illness [10], while CD is considered Th1- type cytokine disease [11-14]. Therefore, regarding Th1/Th2 imbalance it is expected that the prevalence of Graves’ disease might be higher in ulcerative colitis as compared with CD [15].

should take into consideration that thyroid disorders, particularly GD, could be an associated condition in patient with GD especially in cases refractory to treatment.

- (2004) “A case of Graves’ disease occurred as recrudescence of Crohn’s disease,” *Naika* 94: 397-399.
- Taku Inokuchi, Yuji Moriwaki, Sumio Takahashi, Zenta Tsutsumi, Tsuneyoshi KA, et al. (2005) “Autoimmune thyroid disease (Graves’ disease and Hashimoto’s thyroiditis) in two patients with Crohn’s disease: case reports and literature review,” *Intern Med* 44(4): 303-306.
- Slim I, Sellem A, Hassad R, Bahri H, Zayed S, El Bez I, Mhiri A, Slimene MF (2007) Maladie de Basedow et maladie de Crohn: étiopathogénie croisée ou association fortuite? (À propos de deux cas). *Médecine Nucléaire* 31(8): 395-397.
- Brix TH, Hansen PS, Kyvik KO, Hegedus L (2000) Cigarette smoking and risk of clinically overt thyroid disease: a population-based twin casecontrol study. *Arch Intern Med* 160: 661-666.

9. Roura-Mir C, Catalfamo M, Sospedra M, Alcalde L, Pujol-Borrell R, et al. (1997) Single-cell analysis of intrathyroidal lymphocytes shows differential cytokine expression in Hashimoto's and Graves' disease. *Eur J Immunol* 27: 3290-3302.
10. Bonapace ES, Srinivasan R (2001) Simultaneous occurrence of inflammatory bowel disease and thyroid disease. *Am J Gastroenterol* 96(6): 1925-1926.
11. Niessner M, Volk BA (1995) Altered Th1/Th2 cytokine profiles in the intestinal mucosa of patients with inflammatory bowel disease as assessed by quantitative reversed transcribed polymerase chain reaction (RT-PCR). *Clin Exp Immunol* 101(3): 428-435.
12. P. Parronchi, P. Romagnani, F. Annunziato, S. Sampognaro, A. Beccchio, et al. (1997) Type 1 T-helper cell predominance and interleukin-12 expression in the gut of patients with Crohn's disease. *Am J Pathol* 150(3): 823-832.
13. Targan SR, Murphy LK (1995) Clarifying the causes of Crohn's. *Nat Med* 12: 1241-1243.
14. Snook JA, deSilva HJ, Jewell DP (1989) The association of autoimmune disorders with inflammatory bowel disease. *Q J Med* 72: 835-840.
15. Nishimura M, Yamamoto T, Iijima H, Moriwaki Y, Takahashi S, et al. (2001) Basedow's disease and chronic ulcerative colitis: A case report and review of the Japanese literature. *Intern Med* 40: 44-47.