REVIEW ARTICLE

Thyroid Involvement in Eosinophilic Granulomatosis with Polyangiitis

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ABSTRACT

Thyroid disorders are among the most frequent endocrine pathologies, with an overall prevalence estimated at 10%. Autoimmunity plays a crucial role in the majority of thyroid dysfunctions, which explains the frequent associations with other autoimmune diseases. Eosinophilic granulomatosis with polyangiitis (EGPA) (formerly Churg-Strauss syndrome) is a necrotizing systemic vasculitis of small-sized vessels specifically associated with antineutrophil cytoplasmic antibodies. Thyroid involvement is exceptional and uncommon in association with systemic vasculitis. It has not been previously reported during EGPA. We discuss the possible theoretical mechanisms of thyroid dysfunction that can be seen during this systemic angiitis.

Key words: Antineutrophil cytoplasmic antibodies, eosinophilic granulomatosis with polyangiitis, eosinophilic granulomatosis with polyangiitis, thyroid gland, thyroiditis, vasculitis

Eosinophilic granulomatosis with polyangiitis (EGPA), formerly known as allergic granulomatous angiitis or Churg-Strauss syndrome is a very rare necrotizing vasculitis of small and medium-sized systemic blood vessels.[1,2]

It was individualized from periarteritis nodosa (PAN) by Churg and Strauss in 1951, like a systemic and pulmonary vasculitis characterized by the existence of severe asthma, blood, and tissue hypereosinophilia, associated with visceral disorders similar to those of PAN.[3]

Subsequently, it was defined and classified according to the Chapel Hill consensus conference on the nomenclature and classification of systemic vasculitides of 1992 revised in 2012, as small and medium-sized vessel vasculitis, associating: Eosinophil-rich granulomatous inflammation of respiratory tract, necrotizing systemic vasculitis, asthma, and eosinophilia.[4,5]

It is also an autoimmune vasculitis mediated by antineutrophil cytoplasmic antibodies (ANCA) (ANCA-associated vasculitis).[6]

These autoantibodies are noted in about 2/3 of cases, usually of perinuclear pattern (pANCA), and with anti-myeloperoxidase specificity (anti-MPO).[1,2,6]

This systemic angiitis is very rare, with an overall prevalence estimated at 10.7–14/1 million and an incidence of approximately 0.11–2.66/1 million people per year.[7]

Its diagnosis remains, however, a real diagnostic challenge for clinicians, particularly in atypical and incomplete forms, forms with unusual localizations, or forms without ANCA.[1,2] Indeed, recent genome-wide association studies suggest the presence of two genetically distinct subgroups/phenotypes of EGPA: ANCA-positive and -negative subgroups.[1,2]

Endocrine damage, particularly that of the thyroid gland, is exceptional during systemic vasculitis.[8-13] They raise the problem of their mechanism (association of autoimmune diseases? Or specific thyroid localization of vasculitis?), as well as that of their treatment and prognostic implications.[8-13]

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During EGPA, thyroid involvement is exceptional and can theoretically result from two mechanisms:

Mechanism 1: A specific involvement of the thyroid gland by the disease (EGPA). This mechanism can be explained either by necrotizing vasculitis of the thyroid arterioles or by eosinophilic infiltration of the thyroid parenchyma, by analogy to the other systemic manifestations of the disease. We can compare this mechanism to that of the case of Von Maltzahn *et al*.: Pseudo-tumor ovarian involvement caused by necrotizing and eosinophilic ovarian vasculitis proven histologically in an 81-year-old woman followed for EGPA.[14]

Mechanism 2: A non specific involvemnt of the thyroid gland during EGPA. This mechanism involve an association of two autoimmune diseases: EGPA and autoimmune thyroiditis (Hashimoto thyroiditis or Graves's disease) due to the common dysimmune denominator of the two conditions. This mechanism is illustrated by the observation of Sagara *et al*., reporting autoimmune thyroiditis and type 1 diabetes in a 60-year-old woman occurring 12 years after the initial diagnosis of granulomatosis with polyangiitis. This patient expressed simultaneously positive anti-GAD autoantibodies (specific for autoimmune diabetes), positive anti-TPO (specific for Hashimoto's thyroiditis), and positive pANCA (specific for EGPA).[15] This hypothesis is also reinforced by the association of EGPA with other autoimmune diseases such as rheumatoid arthritis[16] and autoimmune hepatitis.[17]

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How to cite this article: Bouomrani S. Thyroid Involvement in Eosinophilic Granulomatosis with Polyangiitis. Clin Res Diab Endocrinol 2020;3(1):1-2.