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New therapies for thyroid autoimmune diseases and Graves' ophthalmopathy**Alessandro Antonelli, Poupak Fallahi, Silvia Martina Ferrari and Giusy Elia**
University of Pisa, Italy

The C-X-C chemokine receptor (CXCR)3 and its IFN- γ dependent chemokines (CXCL9, CXCL10, CXCL11) are involved in the pathogenesis of autoimmune thyroiditis (AT), Graves' Disease (GD) and Graves' Ophthalmopathy (GO). IFN- γ induces the above mentioned chemokines secretion by thyrocytes, orbital fibroblasts and preadipocytes. Th1 lymphocytes recruitment in tissue increase IFN- γ production, enhancing the IFN- γ inducible chemokines tissue secretion and leading to the beginning and perpetuation of the autoimmune process. High levels of circulating IFN- γ inducible chemokines have been shown in patients with AT (overall with hypothyroidism) and in GD and GO patients particularly in the active phase. Peroxisome proliferator-activated receptor (PPAR) - γ or - α agonists exert a modulatory role on CXCR3 chemokines in AT, GD and GO. Also methimazole and corticosteroids have an immuno-modulatory effect on CXCR3 chemokines in GD. Additional studies are ongoing to explore the use of new molecules acting as antagonists of CXCR3 or that block CXCL10 in HT, GD and GO. Recently novel agents targeting the various agents involved in the pathogenesis of GO have been proposed as an alternative to corticosteroids. A randomized trial with Rituximab suggests good efficacy with a relative well tolerated profile in patients with active GO. However discordant results have been reported too. Small antagonists of thyroid stimulating hormone receptor molecules (interacting with the receptor on thyrocytes and fibroblasts), the anti-IGF-1 receptor antibody teprotumumab and tocilizumab (an anti-soluble interleukin-6 receptor) in GO has given hoping results. Randomized and controlled studies are needed to generalize these interesting results.

Biography

Alessandro Antonelli has completed his degree in Medicine in 1982, Specialization in Endocrinology in 1985, Specialization in Occupational Health in 1987 and Specialization in Oncology in 1992 at the University of Pisa, Italy. He is currently an Associate Professor in the Department of Clinical and Experimental Medicine at the University of Pisa. His researches have been published more than 260 articles in international journals (Impact Factor >850). He also serves as an Editorial Board Member and as a Referee and Reviewer of many scientific international journals.

antonelli@med.unipi.it

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