IL-22+ CD4+ T cells are associated with therapeutic Trichuris trichiura infection in an ulcerative colitis patient.

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No increased risk of SBA or CRC was demonstrated in this study despite the long follow-up and the large number of patients. Young age at diagnosis, male gender and stricturing disease at diagnosis were identified as possible risk factors. This suggests that young males with CD should be monitored more carefully from the start, independent of disease location. Studies of colitis in mice as well as clinical trials have suggested that helminth infection can prevent and/or treat IBD.

This article by Broadhurst et al. describes the disease course of a 35-year-old patient diagnosed with severe UC in 2003, refractory to medical treatment. In early 2004, he chose to infect himself with T. trichiura eggs, followed by a completely symptom-free period. In 2008, after deterioration of disease, he chose again to infect himself with T. trichiura eggs, followed by a progressive improvement of the symptoms and histopathological findings. During the whole disease course, the cellular and molecular portrait of changes in the intestinal mucosa was followed with special attention to IL-22, which promotes wound healing and proliferation and Th17 cells.

Characterisation of the cytokine profile in the colonic mucosa by flow cytometry performed in 2008 during flare and in 2009 after remission showed reduction of the expression of IL-17+ cells and activation of a Th2 response as well as IL-22+ Th cells. This was associated with repair of the colonic epithelium and glands and a marked restoration of mucus production. The same change in cytokine profile was observed in the peripheral blood: after re-infection the presence of IL-22+ and IL-17+ Th cells co-expressing IL-4 in response to T. trichiura antigen was observed in association with a lower expression of Th1 cytokines. Carbohydrate metabolism pathways were highly up-regulated in helminth-exposed tissue compared with colitis-associated tissue. Also the expression of mucins 1 and 4 was upregulated after helminth infection. Foxp3+ cells in the colonic mucosa were quantified using immunohistochemistry and were more abundant in the colitis-affected tissue than in the helminth-colonised tissue at both time points, suggesting that the presence of Tregs in the mucosal tissue is driven predominantly by inflammation rather than by helminth colonisation.

Key findings

Intestinal tissue of the colon with active colitis contains IL-17+ Th cells in the lamina propria, whereas intestinal tissue that is colonised by helminths or has undergone mucosal healing contains IL-22+ Th cells, supporting a protective role for IL-22 in maintaining mucosal integrity. These findings can lead to the hypothesis that the presence of T. trichiura in the epithelium activates a Th2 response as well as IL-22+ Th cells to expel the parasites through increased epithelial turnover, goblet cell hyperplasia and increased mucus production in the entire colon. Thus identification of the mechanisms of helminthinduced mucosal responses could provide new therapeutic targets for IBD.