Pediatric Rheumatology

Poster presentation

Activated CD27+ and CD27- memory B cells accumulate in the joints of patients with juvenile idiopathic arthritis

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B cells seem to contribute to the pathogenesis of several autoimmune diseases. Beside their production of pathogenic antibodies, the expression of costimulatory molecules seems to represent an important feature in chronic synovial inflammation.

Using flow cytometry we concomitantly analyzed B cell subsets in the peripheral blood and in the synovial fluid of 22 patients with early-onset pauciarticular juvenile arthritis (EOPA). Additionally we analyzed the rearranged heavy chain immunoglobulin genes of individual synovial B cells using single cell sorting and single cells PCR (3 patients).

The expression of the costimulatory molecules CD80 and CD86 was increased on synovial fluid CD19+ B cells as compared to peripheral blood. CD80/CD86 expression on these B cells could be shown to induce alloreactive T cell proliferation *in vitro*. Most of the synovial fluid B cells belonged to the CD27+IgD- class-switched memory B cell subset. However, almost half of the CD27 negative synovial B cells ("naïve" B cells lacking the memory B cell marker CD27) showed molecular characteristics of memory B cells (isotype switching, somatic hypermuation). These B cells also expressed increased levels of CD80/CD86 as compared to CD27-IgD+ naïve B cells of the synovial fluid.

Activated memory B cells accumulate at the site of inflammation in EOPA patients and might amplify T cell activation as antigen presenting cells by increased expression of the costimulatory molecules CD80/CD86. Beside classical CD27+ memory B cells a new population of memory B cells lacking the memory marker CD27 can be detected in the synovial fluid of these patients.