Pediatric Rheumatology

Poster presentation

Role of Vγ9Vδ2+ γδ T cells in juvenile idiopathic arthritis

M Gerstein*[1], A Bendersky[2], S Padeh[1], I Bank[2] and Y Berkun[1]

Address: [1]Safra Children's Hospital at SHEBA Medical Center, Tel Aviv, Israel and [2]Laboratory for Immunoregulation, Tel Aviv, Israel
* Corresponding author

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Introduction

T cells (TC) bearing Vγ9Vδ2+ γδ TC receptor (TCR), are a subset of innate CD4-CD8- TC pro-inflammatory and immunoregulatory TC recognizing non-peptidic phosphorylated mediator isopentenyl pyrophosphate (IPP) in the mevalonate pathway. The role Vγ9Vδ2+ TC has never been explored in JIA joints.

Patients and methods

Mononuclear cells (MC) isolated from synovial fluids (SF) of 47 patients with monoarticular (M, n = 11), pauciarticular (P, n = 19), extended (E, n = 5), polyarticular (Po, n = 2), systemic (S, n = 4), psoriatic (Ps, n = 4), enthesitis related (Sp, n = 2) JIA were dually stained with monoclonal antibodies to CD3 and variable (V) regions of the γδ TCR. Flow cytometry of fresh SFMC and following *in vitro* 10 days stimulation with 0.5 mg/ml IPP plus 100 IU/ml interleukin-2 (IL-2) was performed.

Results

Vγ9Vδ2+TC constituted 6.8 ± 1.3%, 6.4 ± 0.9%, 4.6 ± 1.0%, 3.8 ± 3.6%, 5.6 ± 1.6%, 6.1 ± 0.1% and 1.3 ± 0.8% of the SF CD3+cells in the M, P, E, Po, Ps, Sp and S JIA types respectively, and were significantly higher in ANA+ (n = 19) than ANA- (n = 22) patients (7.8 ± 0.9% vs 4.1 ± 0.6% $p < 0.004$, Student T test). IPP and IL-2 activated SFMC showed a greater expansion of Vγ9Vδ2+ TC of ANA+ (n = 12) than ANA- (n = 18) patients (61.2 ± 17.1% vs 31.7 ± 7.6%, $p < 0.005$) and of patients with M or P (n = 11) relative to S, E or Po (n = 6) JIA (44.9 ± 10.9 vs 16.2 ± 10.5 $p < 0.02$).

Conclusion

SF Vγ9Vδ2+ TC responses are stronger in M and P than in E, Po, and S JIA and in ANA+ than – patients, suggesting that a potent Vγ9Vδ2+ TC response may augment acute inflammation while limiting progression to chronic and destructive arthritis.