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Inflammatory Changes in Postmenopausal Women including Th17 and Treg

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Abstract : Objective: Prevalence of osteoporosis, cardiovascular disorders, and Alzheimer's disease rapidly increase after menopause. Immune activation and inflammation are suggested as an important pathogenesis of these serious diseases. Several pro-inflammatory cytokines are increased in women with surgical or natural menopause. However, the little is known about IL-17 producing T cells and Foxp3+ regulatory T (Treg) cells in post-menopause. Methods: A total of 34 postmenopausal women, who had no active cardiovascular, endocrine and infectious disorders were recruited as study group and healthy premenopausal women participated as controls. Peripheral blood mononuclear cells were isolated. Immuno-morphologic (CD3, CD4, CD8, CD19, CD56/CD16), intracellular cytokine (TNF-alpha, IFN-gamma, IL-10, IL-17), and Treg cell (Foxp3) studies were carried out using flow cytometry. The proportion of peripheral lymphocytes, including IL-17 producing and Foxp3+ Treg cells immune cell in each group were statistically analyzed. Results: The proportion of NK cells was significantly increased in menopausal women as compared to that of controls (P=.005). The ratios of TNF-alpha/IL-10 producing CD3+CD4+ T cells were increased in postmenopausal women. CD3+IL-17+ T cell level was higher in postmenopausal women and CD4+ Foxp3+ Treg cells was lower than that of controls. The ratios of CD3+IL-17+ T cell to CD3+Foxp3+ and to CD4+Foxp3+ Treg cells were significantly increased in postmenopausal women (P=.001). Conclusions: We found enhanced innate immunity and Th1- and Th17-mediated adaptive immunity in postmenopausal women. This may explain increasing prevalence of chronic inflammatory diseases after menopause. Further studies are needed to elucidate what factors contribute to this inflammatory shift in the postmenopause.

Keywords : inflammation, immune cell, menopause, Th17, regulatory T cell
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