Fluctuation of Peripheral Blood T, B, and NK Cells during a Menstrual Cycle of Normal Healthy Women

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Cyclical hormonal changes during an ovarian cycle may affect immune responses, which is crucial for the embryonic implantation. We aim to investigate whether the levels and activity of T, B, and NK cells change during a menstrual cycle. Twenty-two normally cycling women were enrolled and peripheral blood was drawn serially during a menstrual cycle. Intracellular cytokine expression of CD3+CD4+ and CD3+CD8+ cells, and Th1/Th2 cytokine-producing T cell ratios were determined using flow cytometric analysis. NK cell cytotoxicity was measured by flow cytometric analysis at E:T ratios of 50:1, 25:1, and 12.5:1 and also using LU at 20% Proportions (percentage) of CD3+ (p = 0.046) and CD3+CD4+ (p = 0.002) T cells were increased in the follicular phase compared with the luteal phase. The levels of CD3−CD56+ (p = 0.010) and CD3−CD56dim (p = 0.012) NK cells and NK cytotoxicity at E:T ratio of 50:1, 25:1, and 12.5:1 and LU at 20% were significantly increased in the luteal phase compared with the follicular phase. Even though IL-10-producing CD3+CD4+ T cells were significantly lower in the midluteal phase as compared with the early follicular phase, proportions of CD19+ B cells, CD3+CD56+ NKT cells, Th1 cytokine-producing T cell subsets, and ratios of Th1/Th2 cytokine-producing T cells were not significantly changed during a menstrual cycle. We conclude that peripheral blood NK and T cell levels as well as NK cytotoxicity are changed during a menstrual cycle. Neuroendocrine regulation on immune responses is suggested during an ovarian cycle, which may be critical for embryonic implantation and pregnancy.