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Peripheral Polymorphonuclear Leukocytes at Ovulatory Period Are in an Activated State

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The ovulatory process has been compared with inflammation because of the leukocyte infiltration and detection of inflammatory mediators in the ovary. We examined the contents of superoxide, hydrogen peroxide and nitric oxide (NO) on peripheral blood polymorphonuclear leukocytes (PMN) during menstrual cycles, and found that PMN contained markedly high amounts of superoxide particularly at the 3 days of peri-ovulatory period, and higher amount of NO at the ovulatory day.

Assuming the reason for activation of PMN to luteinizing hormone (LH), the surge of which precedes the ovulation, we had an attempt to activate PMN in vitro with pituitary LH. It was revealed that this hormone enhanced the content of superoxide dose-dependently, expressed inducible NO synthase (iNOS) and generated high amounts of nitrite/nitrate ions in PMN.

These results indicated that the LH surge at pre-ovulatory period resulted in general activation of PMN, suggesting that this state of PMN might have a physiological role on ovulation, rather than a defensive role against infection.