

T-LYMPHOCYTE SUBSETS IN NORMAL MENSTRUAL CYCLE

P. F. BOLIS, M. FRANCHI, L. BABILONI,
S. GUASCHINO, L. MARINO

Institute of Obstetric and Gynaecologic Clinic
University of Pavia (Italy)

An imbalance between "helper" and "suppressor" T cells has recently been demonstrated in several autoimmune diseases (^{1,9}), and in immunodeficiency states (¹) by means of monoclonal antibodies that react against T cells subsets.

However there is little information on the T Helper-Suppressor cell ratio in healthy people.

A significant decrease in the relative and absolute numbers of Helper T-lymphocytes (OKT4 positive cells) has been reported in normal pregnancy (^{3,10}). Such a decrease may be due to hormonal changes associated with pregnancy (¹⁰).

No data are available about T Helper-Suppressor cells in normal menstrual cycle, while a significant decrease of natural Killer activity was observed in the first half of the cycle (¹¹) and of total T-lymphocytes during menstrual period (⁷).

PATIENTS AND METHOD

27 healthy volunteers were studied. Their age ranged from 23 to 30 years. The basal temperature showed normal biphasic patterns.

The test was carried out on three blood specimens taken at different times during the menstrual cycle; the first (A) belonging to preovulatory phase (10 ± 2 days), as defined by basal temperature, the second (B) to luteal phase (23 ± 1 day), and the third (C) to menstrual period.

T lymphocytes subpopulations were evaluated by means of monoclonal antibodies using a technique already described (^{3,4}) and employing kits purchased from Ortho Pharmaceutical (OKT3 antibody identifies almost all T cells; OKT4 identifies T lymphocytes presumably Helper, OKT8 T lymphocyte presumably Suppressor).

The statistical analysis of the results was evaluated by Student's T test.

SUMMARY

OKT3, OKT4, OKT8 positive cells levels were evaluated in 27 healthy volunteers, during preovulatory phase, luteal phase and menstrual period.

OKT3, OKT4 positive cells showed no statistical difference over the three periods, while OKT8 positive cells decrease in preovulatory phase compared to both luteal phase ($p < 0.05$) and menstrual period ($p < 0.02$).

A possible immunoregulatory function of oestrogens is discussed.

RESULTS

Table 1 and figures 1, 2, 3 show our findings.

None of the three blood samples shows any statistically significant change in the levels of OKT3 positive cells (A: 75.56 ± 5.23 ; B: 75.02 ± 5.34 ; C: 76.93 ± 5.56).

Table 1. — OKT3, OKT4, OKT8 positive cells levels in: A preovulatory phase, B luteal phase, C menstrual period.

	A	B	C
OKT3	75.56±5.23	75.02±5.34	76.93±5.56
OKT4	47.17±11.15	44.11±9.14	43.30±9.89
OKT8	19.44±7.43	24.00±8.89*	25.68±9.76**

* A/B $t=2.027$, $p<0.05$

**A/C $t=2.572$, $p<0.02$

As for OKT4 positive cells (Helper) a slight increase was detected during pre-ovulatory phase (A), but with no statistical significance (A: 47.17 ± 11.15 ; B: 44.11 ± 9.14 ; C: 43.30 ± 9.89).

OKT8 positive cells (Suppressor) levels decreased during pre-ovulatory phase (A) with a statistical significance compared to both luteal phase (B) ($t=2.027$ $p<0.05$)

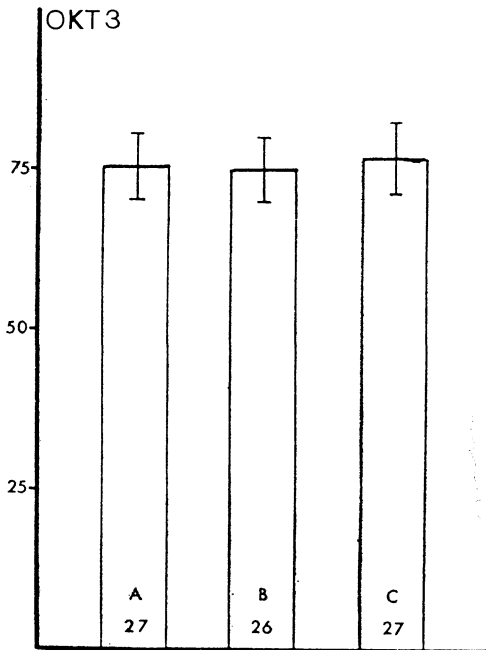


Fig. 1. — OKT3 positive cells levels in preovulatory phase (A), luteal phase (B), menstrual period (C).

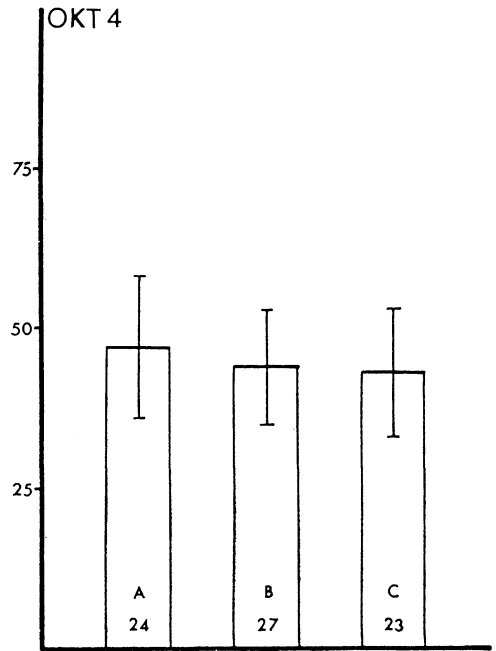


Fig. 2. — OKT4 positive cells levels in preovulatory phase (A), luteal phase (B), menstrual period (C).

and menstrual period (C) ($t=2.572$ $p<0.02$) (A: 19.44 ± 7.43 ; B: 24.0 ± 8.89 ; C: 25.68 ± 9.76).

DISCUSSION

According to our data, total T lymphocyte number (OKT3 positive cells) doesn't modify in normal cycle. However, the erythrocyte-rosetting method⁽⁷⁾ detected a significant decrease in T lymphocytes during menstrual period. Such a discrepancy may be due to the variability connected with the erythrocyte-rosetting methods. Moreover recent evidence indicates that not all the cells that can form erythrocyte rosettes are thymus-processed cells⁽²⁾. In our research a monoclonal antibody (OKT3) was used, capable of reacting specifically against almost all T cells⁽⁸⁾.

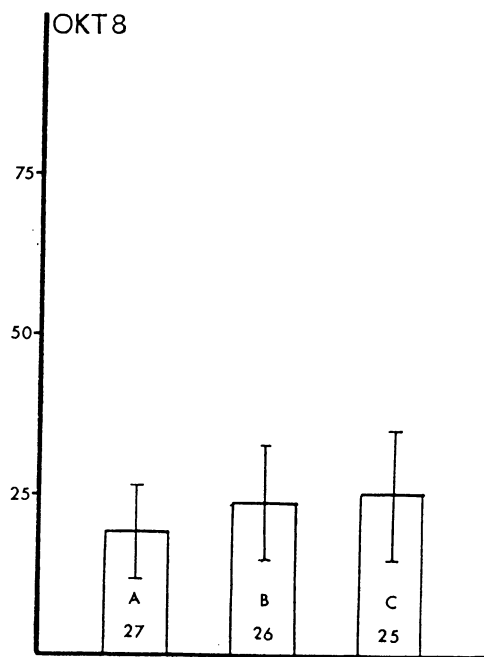


Fig. 3. — OKT8 positive cells levels in preovulatory phase (A), luteal phase (B), menstrual period (C).

OKT4 positive cells (Helper) increase in pre-ovulatory phase but with no statistical significance.

OKT8 positive cells (Suppressor), instead, show a significant decrease in pre-ovulatory phase as compared with the samples taken both in luteal phase ($p < 0.05$) and in menstrual period ($p < 0.02$).

The mechanism of the selective decrease of OKT8 positive cells is unknown; since the various phases of the cycle are under hormonal control, hormones might be involved in this decrease. More specifically oestrogens seem to be involved in immunoregulatory functions. Castrated mice,

treated with oestrogens, showed a decrease of T suppressor cells⁽⁵⁾.

From a clinical point of view, human autoimmune diseases are more frequent in women⁽⁶⁾. For example the prevalence of systemic lupus erythematosus in the female: male ratio has been report as 89:11, and the same ratio in chronic thyroiditis is stated to be 4:1. This female bias seems to occur only after puberty.

This clinical evidence hints at a major role of sex hormones in regulatory autoimmune responses.

Further information is needed in order to better define immunoregulatory function of oestrogens in humans.

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