the literature [5, 8], the basic regenerative processes in the CNS of man and animals take place at the intracellular level. This is manifested morphologically by hypertrophy of the cells. In the material in the present investigation no hypertrophy of neurons could be detected.

Cellular regeneration of the injured tissue thus does not take place in rabbit fetuses at the 20th-24th day of intrauterine life after mild mechanical brain trauma. Manifestations of a regenerative character affecting the brain neurons include a marked increase in the number of binucleolar neurons developing after brain trauma. Some workers [6, 9] consider that this is a compensatory and adaptive phenomenon.

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EFFECT OF T AND B LYMPHOCYTES ON PHAGOCYTIC ACTIVITY OF HUMAN PERIPHERAL BLOOD POLYMORPHS

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KEY WORDS: T and B lymphocytes; polymorphs; neutrophils; lymphocytes.

Immune lymphocytes can stimulate phagocytes, which then digest infectious agents more actively [4, 6, 8, 9]. Stimulating properties are ascribed predominantly to T cells [4]. Isolation of different subpopulations of T and B lymphocytes makes possible a more detailed study of this problem, and this is currently important because during infection definite correlation exists between the number of individual lymphocyte subpopulations and the form and course of the pathological process [1, 2]. The investigation described below was carried out for this purpose.

MATERIALS AND METHODS

Lymphocytes and neutrophils were isolated from the heparinized venous blood of 28 patients with suppurative surgical infections in a 1.077 Ficoll—Verografin density gradient. The rosette formation test was carried out with the lymphocytes, using papainized [14] sheep, rabbit, and mouse erythrocytes or an EAC diagnostic kit with bovine erythrocytes, after which the cells were separated into subpopulations by repeated centrifugation on the same gradient. If necessary, the cells were freed from erythrocytes by hypotonic shock. As a result a total lymphocyte population (T + B + "null" cells), T lymphocytes, active (activated) T lymphocytes (T_{act} — a combination of helpers, depressors, and killers) [11], T lymphocytes with receptors

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TABLE 1. Content (in percent) of Human Peripheral Blood Neutrophils Taking Part in Phagocytosis after Culture for 18 h with Different Populations of Autologous Lymphocytes (control — monoculture; M ± m)

Lymphocyte population	Receptors of phagocytes			
	FcμR	FcγR	C'R	R⁻
T+B+ "null"				
Experiment	4,5±0,8	10,0±3,0	9,7±2,1	8,0±1,7
Control	5,5±2,1	7,0±0,3	9,5±3,3	4,5±0
T				
Experiment	13,7±5,3	28,7±4,9*	26,4±3,6*	14,9±3,2*
Control	6,6±2,4	12,6±4,3	12,2±2,5	5,8±1,4
T_{act}				
Experiment	18,6±1,2*	24,2±2,7*	25,1±0,7*	20,2±2,1*
Control	6,6±1,7	8,2±2,3	7,5±2,0	6,4±0,9
T_{rab}				
Experiment	4,2±1,4	3,8±1,6*	4,1±0,9	1,9±0,7
Control	6,9±4,4	12,2±2,9	9,0±2,2	3,1±0,9
B + "null"				
Experiment	3,8±0,6	7,4±1,9	10,1±4,0	3,9±1,0
Control	5,7±1,8	11,2±3,3	11,7±1,9	5,4±1,1
B_{mouse}				
Experiment	3,6±0,8	5,6±2,5	9,8±2,6	5,1±1,0
Control	7,7±2,0	11,0±3,3	10,8±0,4	5,8±1,4

*P < 0.05 compared with T + B + "null" cells.

TABLE 2. Action of Different Subpopulations of Autologous Lymphocytes on Content of Neutrophils Taking Part in Phagocytosis on Comparison of Each Test with Control

Lymphocyte population	Number of patients investigated	Number of tests	Effect, percent	
			increase	decrease
T+B+ "null"	3	12	25	0
T	6	24	67*	0
T_{act}	4	15	100*	0
T_{rab}	4	15	0	47*
B+ "null"	8	32	3	22*
B_{mouse}	11	43	19	37*

* P < 0.05 compared with T + B + "null" cells.

for rabbit erythrocytes (T_{rab} — hypothetically active T depressors) [1, 2, 5], B lymphocytes, and also B lymphocytes with receptors for mouse erythrocytes (B_{mouse} — maturing B lymphocytes [5, 7]) were isolated by the methods described previously [1].

The purity of fractionation was 70-95%, with a proportion of 90-95% of living lymphocytes. Lymphocytes were then mixed again in an autologous system with neutrophils in the ratio of 1:100 and cultured for 18 h in siliconized centrifuge tubes (to prevent adhesion of the cells to the glass) in MEM medium, with 10% inactivated AB serum with the addition of 100 Units penicillin and streptomycin to 1 ml, and aerated with air + 5% CO_2. The volume of the mixture was 1 ml ($2 \cdot 10^{-6}$-$3 \cdot 10^{6}$ neutrophils). After removal of the culture (the viability of the cells was over 90%) phagocytosis of native bovine erythrocytes or of these erythrocytes loaded with IgM, IgG, and an IgG-C' complex after incubation for 90 min at 37°C was investigated in special chambers. At each stage of the experiment and control (neutrophil monocultures) 2 or 3 parallel tests were carried out. Films were stained by Romanovskii's method. The significance of differences was assessed by Student's paired t test for individual differences or by the χ^2 test.

RESULTS AND DISCUSSION

The overall analysis (Table 1) showed that the combined T + B + "null" cell population did not affect the relative percentages of phagocytosed neutrophils with receptors for Fc-fragments of IgM (FcμR), IgG5(FcγR), and C' (C'R) or of phagocytes without receptors for these factors (R^-). The total population of T lymphocytes increased phagocytosis through FcγR, C'R, and without receptors by 2.5-3 times, T_{act} increased the relative percentages of all types of phagocytes, and T_{rab} reduced its FcγR; the total B population + "null" cells and B_{mouse} had no effect on the number of phagocytes with different receptors.

Comparison of the results of each test with the control (Table 2) showed that the total lymphocyte population stimulated 25% of tests, possibly due to the absence of any serum blocking factors in the culture medium. The effect of the other lymphocyte subpopulations was compared with these results. The total population of T lymphocytes increased the percentage of neutrophils taking part in phagocytosis in 67% of tests, T_{act} did so in all tests, T_{rab} reduced this figure in 47%, B + "null" cells in 22%, and B_{mouse} in 37% of tests. The last three subpopulations possessed weak stimulating activity or none whatsoever.

The presence of receptors for immune factors on phagocytes is a characteristic of their functional state. For instance, FcR and C'R are a sign of activated phagocytes [3, 10] and potentiation of the antibacterial properties of these cells is combined with the degree of abundance of FcγR [13], FcμR, and C'R [12]. Consequently, in the lymphocyte—phagocyte system, just as in the T lymphocyte—B lymphocyte system, mononuclears may have different func-

tional properties. In that case they behave as helpers (T, T_{act}) or as depressors (T_{rab}, B + "null"), but they may also possess both types of activity (B_{mouse}). In relation to B_{mouse} lymphocytes this depends on the initial level of the reactions: Inhibition is characteristic of a value of 13.5-1.6%, stimulation is characteristic of a value of 7.3-2.3% ($P < 0.05$). Lymphocytes may have a corresponding effect on phagocyte function in an inflammatory focus, where the proportions of the various mononuclear subpopulations may differ from the peripheral blood picture: In some patients with suppurative wound infection the number of B_{mouse}, T_{rab} and, in particular, of T_{act} cells is increased.

The results offer prospects of a new method of assessing the role of lymphocytes in infection through their regulating influence on the (phagocytes—basic effects of antibacterial immunity) system.

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STIMULATION OF TRANSIENT ENDOGENOUS SPLENIC COLONY FORMATION IN NORMAL AND PLETHORIC MICE INFECTED WITH *Mycoplasma arthritidis*

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Features distinguishing the action of *Mycoplasma arthritidis* on the hematopoietic system of experimentally infected mice include stimulation of endogenous colony formation [3], activation of erythropoiesis in sublethally irradiated [4] plethoric [1, 5] mice, and abolition of the block of erythroid differentiation induced by repeated injections of small doses of actinomycin D, which is evidence of the erythropoietin-independent character of the stimulating effect of this organism [1], have led to the hypothesis that the target cells for *M. arthritidis* may be found among precursors at the stage(s) of differentiation between colony-forming stem cells and erythroid cells, production of which from precursors depends on erythropoietin (EP). Colony-forming cells forming transient endogenous colonies in the spleen (CFU-TE) satisfy these conditions. They begin to appear on the 3rd day after sublethal irradiation; on the 7th day the colonies disappear [6]. CFU-TE production from hemat-

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