

INTRAVASCULAR LIFE SPAN OF GRANULOCYTES IN THYROTOXICOSIS AND DIABETES MELLITUS

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It was shown by the method of intravital labelling of granulocytes with mepacrine that their life span in the blood stream of patients with thyrotoxicosis is reduced, but increased in the case of diabetes mellitus. At the same time changes are found in the glycogen content of the neutrophils.

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Data have been obtained showing that the life span of granulocytes in the circulating blood, normally 30-40 min [2, 4, 13, 18] out of a total life span of 7-13 days [17-20], may be varied under pathological conditions [18, 21]. Vascular permeability may play an important role in these changes in the rate of withdrawal of granulocytes from the blood stream [14].

The intravascular life span of granulocytes in patients with thyrotoxicosis or diabetes mellitus was studied in the present investigation because in thyrotoxicosis the capillary permeability is increased [5, 6, 9, 10], while in diabetes mellitus it is reduced [5, 6, 11] depending on the severity of these diseases. Since the kinetics of the granulocytes may also depend on their physiological functions, the content of glycogen, one of the main sources of energy, in the blood neutrophils of these patients was also investigated [8, 12, 15, 16, 22].

EXPERIMENTAL METHOD AND RESULTS

Granulocytes were labeled with mepacrine by intravenous injection of the drug in a dose of 0.75 mg/kg [18], and the number of labeled cells subsequently counted under the MBI-6 universal microscope, using blue and yellow filters [3, 7].

By calculating the percentage of fluorescent granulocytes in blood films taken 2, 5 min, and thereafter every 15 min for 1 h after labeling, the life span of the granulocytes in the blood stream was determined. The patients (10 in each group) were aged from 30 to 40 years, and the duration of the disease, in a moderately severe or severe form, was from 4 to 8 years.

Glycogen in the neutrophils was determined by Shabadash's method without counterstaining of the nuclei. The glycogen content was estimated by simultaneous investigation of comparable blood films under the MS-51 microscope.

The mean histochemical index (MHI) of Astaldi and Verga [1] was determined.

The intravascular life span of the granulocytes in patients with thyrotoxicosis was shorter than in those with diabetes mellitus. The mean number of fluorescent granulocytes in the patients with thyrotoxicosis 15 min after labeling was $14.1 \pm 6.3\%$ ($M \pm \sigma$), while after 30 min hardly any could be found, whereas in patients with diabetes labeled cells were observed even after 45 min (4.7-3.8%). The value of MHI re-

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flecting the glycogen content in the neutrophils was slightly higher (2.05 ± 0.11) in the blood of thyrotoxic patients than in the diabetics (1.93 ± 0.09) and healthy subjects (1.99 ± 0.05); the glycogen content in the neutrophils was lower in the diabetic patients than in healthy subjects.

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