

BLOOD PLATELET ADENASE IN HEALTHY MONKEYS
AND IN MONKEYS WITH HEMOBLASTOSIS OF DIFFERENT SEVERITYYa. M. Sokovnina, S. S. Debov, *
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By means of a sensitive radioactive method the blood platelet adenase activity of healthy monkeys and of monkeys with hemoblastosis of different severity was studied. A marked increase was found in the specific enzyme activity in clinically severe forms of hemoblastosis, but the enzyme activity decreased in the stage of remission and in mild forms of the disease. No adenase was found in the platelets of healthy monkeys.

KEY WORDS: Adenase (adenine-aminohydrolase, EC 3.5.4.2); hemoblastosis.

In a previous investigation the writers showed that adenase (adenine-aminohydrolase, EC 3.5.4.2) is present in the platelets of leukemic patients and is completely absent in platelets of healthy donors [3]. Donors' platelets were found to contain an inhibitor, located in the fraction of granules isolated by ultracentrifugation in a sucrose gradient [4]. The development of an outbreak of virus hemoblastosis among baboons (*Papio hamadryas*) in the Sukhumi monkey nursery was reported previously, and it has not yet ended [1, 2, 5, 8]. It was accordingly decided to study the adenase activity in blood platelets of these baboons with hemoblastosis of different severity. Hemoblastosis in this herd of baboons is characterized by a prolonged course with the development of spontaneous remissions, ending as a rule in death of the animal. If severe damage to the hematopoietic system is present, early changes in the megakaryocytic series are observed in the bone marrow of the affected animal, as well as changes in the clotting system as a whole, [6].

EXPERIMENTAL METHOD

Adenase activity in platelets isolated from the monkeys' blood was determined by the method described earlier [3, 7]. The specific activity of the enzyme was expressed in nanomoles hypoxanthine formed from adenine per milligram protein [9]. In this investigation blood platelets from seven female baboons aged 2-14 years with hemoblastosis of different severity, were studied. Healthy monkeys were used as the control. The duration of the disease varied in different animals from 8 months to 3 years. In three cases (monkeys Nos. 13489, 13587, and 14421) the disease in the monkeys was at its height at the time when the adenase activity of their blood platelets was determined. Considerable splenomegaly was observed (the spleen projected 2.5-3 cm below the costal margin). The peripheral lymph nodes also were enlarged. The blood profile was lymphoid. In two monkeys (Nos. 11047 and 12621) the clinical manifestations of hemoblastosis at the moment of investigation were less severe (the spleen projected only 1.5 cm below the costal margin), but they were stable in character and had not disappeared 1.5 months after the investigation. In the last two monkeys (Nos. 9511 and 5565) adenase activity was determined one month after the beginning of development of a spontaneous remission. Both monkeys died one month after the investigation from causes unconnected with the development of hemoblastosis (from colitis and septicemia), and the state of almost complete remission was confirmed at autopsy.

EXPERIMENTAL RESULTS

The results of determination of adenase activity in the platelets of the control monkeys and monkeys with hemoblastosis of different severity are given in Table 1. They show the absence of adenase in platelets of healthy monkeys. Comparison of the specific adenase activity in the blood platelets of monkeys with hemoblastosis of different severity shows that low specific enzyme activity was present in the monkeys with a mild form of the disease, but activity of the enzyme in the blood platelets of monkeys with a well-marked clinical picture of hemo-

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TABLE 1. Adenase in Blood Platelets of Healthy Monkeys and of Monkeys with Hemoblastosis of Different Severity

Trace No.	Duration of disease	Age	Severity of disease	Specific activity, nmoles hypoxanthine formed/mg protein/h
11047	3 years 5 months	4 years	Mild form	0,5
12621	2 years 1 months	7 years	Ditto	0,43
13489	2 years 6 months	3 years	Well-marked clinical picture of hemoblastosis	2,6
13587	1 year 10 months	3 years	Ditto	11,0
14421	1 year 11 months	2 years	"	10,9
9511	9 months	9 years	Remission	0,6
5565	9 months	14 years	"	1,0
Normal				0

blastosis was considerably increased (about 17 times higher than in the mild form of the disease).

In the stage of remission adenase activity fell sharply. It is difficult, on the basis of this material, to draw the conclusion that adenase activity is strictly proportional to the severity of the symptoms of hemoblastosis. However, it can definitely be stated that the enzyme activity is much higher in hemoblastosis with a marked clinical picture, and determination of adenase activity can evidently be used as a method of assessing the severity of the clinical manifestations of the disease.

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