

ELEVATION OF SERUM ALDOLASE AND TRANSAMINASES LEVEL IN THE COURSE OF TRICHINELLOSIS

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In the course of diseases characterized by the tissue damage, especially necrosis, some tissues enzymes are liberated from the cells and their activity increases manifold in the serum. In the last years the elevation of serum aldolase (SA), serum glutamylxaloacetic transaminase (SGOT) and serum glutamylpyrovic transaminase (SGPT) was described by several workers in such diseases as infectious hepatitis, liver cirrhosis, coronary thrombosis, severe pneumonia and pulmonary infarctions, haemorrhagic pancreatitis, malignant neoplasma and progressive muscular dystrophy. However in the available literature no mention is made on the activities of these enzymes in the course of trichinellosis.

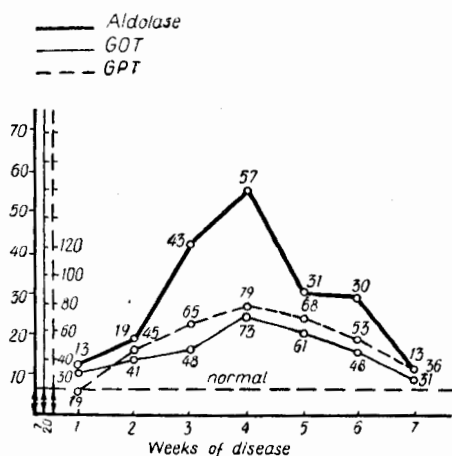
Because it is well known that during invasion of muscles by the larvae *Trichinella*, the damage of striated muscle fibers is followed by inflammation, degeneration and necrosis (myolysis), we have decided to study the activity of SA, SGOT and SGPT in the course of this disease.

In our department we have observed 30 patients with trichinellosis (18 females and 12 males) in the age from 10-54. We have diagnosed mild trichinellosis in 12 cases, intermediate trichinellosis in 12 cases and severe trichinellosis in 6 cases. All patients recovered without any complications.

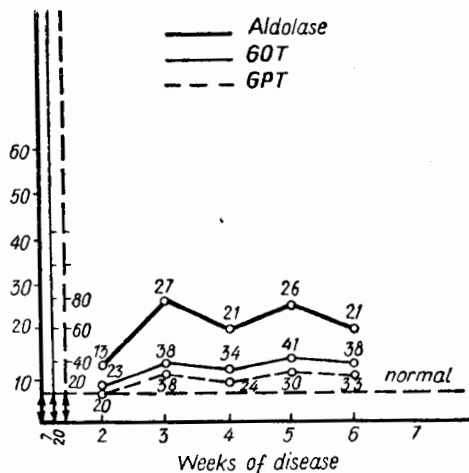
The activity of aldolase was determined by the method of Sibley and Lehninger, modified by Bruns and Puls, the activity of transaminase — by the method of Umbreit and collab. modified by Niewiarowski and Czupryna. Aldolase activity averaged in the normal subjects 7.0 ± 6 u., SGOT activity $16,5 \pm 9$ u., SGPT activity $20,5 \pm 9$ u. (on the graphs 20.0 u was accepted as an averaged level for the both enzymes).

Enzymes activity determinations were performed 1-2. ce per week.

It could be seen from graph 1 that the activity of enzymes increases gradually in all patients from the beginning of sickness, and attains the highest level during the 4th week. Thereafter this activity diminishes and the normal values are to be found in the 7th week of disease and later. The curves presented on the graph 1 show that SA increases 8-fold and transaminases 3 fold.



Graph 1

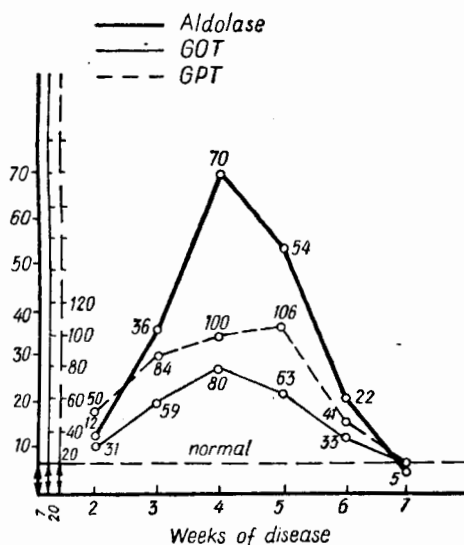


Graph 2

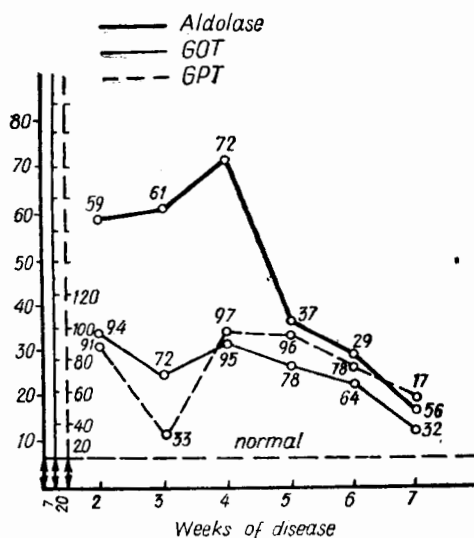
The average values of enzyme activities determined in 12 mild cases of trichinellosis are shown on graph 2. The curves are rather flat. Aldolase activity increases 4-fold, and transaminases activity 2-fold.

The curves on graph 3 (intermediate cases of trichinellosis), show higher activity of transaminases (SGOT increases 4-fold and SGPT-5-fold) and an important elevation of SA which increases 10-fold during the 4th week of disease.

The activity of all determined enzymes in severe cases (graph 4) increases just from the beginning of disease. Maximal values were found also in 4th week of disease (especially high, more than 10-fold increase of aldolase should be noted), thereafter enzyme activity dropped rather slowly, complete normalization was attained after 7th week of disease.



Graph 3



Graph 4

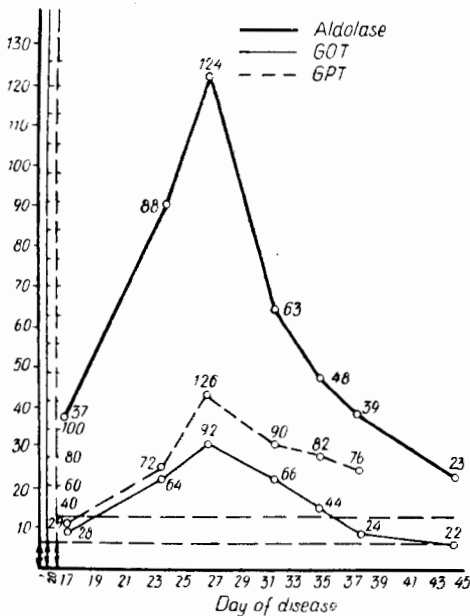
Graph 5 shows the behaviour of SA, SGOT and SGPT in the serum of severe patient P. S. 18-fold increase of aldolase and 4-6-fold increase transaminases should be noted.

Graph 6 shows a comparison of aldolase activities in mild intermediate and severe cases. A correlation between serum enzymes level and clinical course of disease is to be seen.

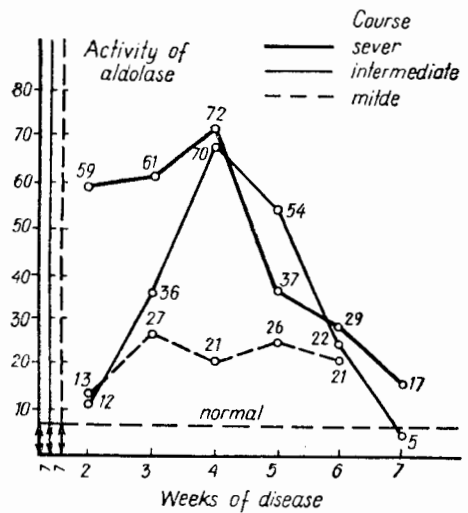
The increase of enzymes activity in the serum can be explained by the increased liberation of the enzymes from the skeletal muscles cells. The damage of these cells is due to the invasion of parasites occurring with the highest intensity in 4th week of disease. It seems that the activity of the studied enzymes in the serum is proportional to the extent of damage to the muscles in trichinellosis. Similarly it was found that in the experimental necrosis of the liver and in the experimental coronary thrombosis the activity of these enzymes in serum depends on the extent of the damage to the liver and to the heart muscle. The curves shown on the graphs 2, 3, 4, 6 strongly support our supposition. A highest enzyme activity is found in severe cases, especially when such complications appear as myocarditis, hypoproteinemia, oedema, anemia and others. It is therefore possible that the

determination of the activity of the aldolase and transaminases will be useful not only for the diagnostic purposes but also for the evaluation of the course of trichinellosis.

In trichinellosis, similarly as in the progressive muscle dystrophy we have found a relatively higher increase of the activity of the aldolase (8-fold on the average) than transaminases (3-fold on the average) contrary to the diseases of liver and coronary thrombosis. E. G. in the course of virus hepatitis we (Wysocki, Niewiarowski, Rachoń) have previously found a 21-fold increase of SGOT, 26-fold increase of SGPT and 7-fold increase of SA.



Graph 5



Graph 6

From the above experiments the following conclusions may be drawn:

1). In the course of trichinellosis an elevation of SA, SGOT and SGPT is observed. The maximal activity is noted in the 4th week of disease, thereafter this activity diminishes and the normal values are to be found in the 7th week of disease and later.

2). Enzymes activity is correlated with the clinical course of disease, a highest activities of enzymes (especially of aldolase) could be found in severe cases.

3). The increase activity of aldolase is several times higher than the increase of activity of transaminases.

4). Determinations of SGOT, SGPT and SA may be important in the differential diagnosis of trichinellosis and evaluation of severity of disease.