Introduction: Activity of chitotriosidase (CT) is increased in some lysosomal storage diseases. Therefore, this enzyme can be used as biochemical marker in the diagnosis of these diseases. The aim of this study was to establish and compare biochemical parameters (Km, Vmax, optimum pH and temperature stability) of CT in Gaucher Disease individuals before (G) and after (GT) treatment with enzyme replacement in order to observe if there is a change in their behavior. These parameters were compared with the normal enzyme, also.

Material and methods: CT activity was measured in plasma using the artificial substrate 4-methylumbelliferyl-β-D-NN'N''-triacetylchitotrioside. To determine the optimum pH of the reaction, the pH of assay varied from 3.5 to 6.8. The Km and Vmax were determined using substrate concentrations from 0.005 to 0.02 mM for normal individuals (C), G and GT patients. For thermal stability studies, samples were preincubated for 1, 3, 5, 10 and 15 min at 50°C and 1, 3 and 5 min at 60°C in the absence of substrate. The enzymatic reaction was then conducted at 37°C. The activity was expressed by % of enzyme inactivation compared with the preincubation conducted at 0°C (100% of activity).

Result and Discussion: We were able to differentiate the group C from G according to the Km, Vmax and thermal stability at 50 and 60°C. C group differentiate from GT according to the Km and thermal stability at 60°C and group G differentiate from GT according to the Vmax of the reaction. Conclusions: Thus, unless by measuring the Vmax of the enzyme reaction, it was not possible to distinguish individuals with and without treatment or even observe the effectiveness of this action by biochemical parameters of this enzyme.

Key-words: enzyme biochemical characteristic, chitotriosidase, Gaucher Disease