

Serum cytokine profile, beta-hexosaminidase a enzymatic activity and gm2 ganglioside levels in the plasma of a tay-sachs disease patient after cord blood cell transplantation and curcumin administration: A case report

Shaimardanova A.A., Chulpanova D.S., Solovyeva V.V., Garanina E.E., Salafutdinov I.I., Laikov A.V., Kursenko V.V., Chakrabarti L., Zakharova E.Y., Bukina T.M., Baydakova G.V., Rizvanov A.A. *Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

Abstract

Tay-Sachs disease (TSD) is a progressive neurodegenerative disorder that occurs due to a deficiency of a β hexosaminidase A (HexA) enzyme, resulting in the accumulation of GM2 gangliosides. In this work, we analyzed the effect of umbilical cord blood cell transplantation (UCBCT) and curcumin administration on the course of the disease in a patient with adult TSD. The patient's serum cytokine profile was determined using multiplex analysis. The level of GM2 gangliosides in plasma was determined using mass spectrometry. The enzymatic activity of HexA in the plasma of the patient was assessed using a fluorescent substrate assay. The HexA α -subunit (HexA) concentration was determined using ELISA. It was shown that both UCBCT and curcumin administration led to a change in the patient's cytokine profile. The UCBCT resulted in an increase in the concentration of HexA in the patient's serum and in an improvement in the patient's neurological status. However, neither UCBCT nor curcumin were able to alter HexA activity and the level of GM2 in patient's plasma. The data obtained indicate that UCBCT and curcumin administration can alter the immunity of a patient with TSD, reduce the level of inflammatory cytokines and thereby improve the patient's condition.

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Keywords

Cord blood cell transplantation, Curcumin, Cytokine profile, GM gangliosidosis 2, Lysosomal storage diseases, Tay-Sachs disease, β hexosaminidase A

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