

MESENCHYMAL STEM CELL AS A CURE FOR BRAIN DAMAGE INDUCED BY CHRONIC TOXOCARA CANIS INFECTION IN AN EXPERIMENTAL MOUSE MODEL

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Human toxocariasis is an important worldwide soil-transmitted zoonotic disease. Neurotoxocariasis is a serious condition that is linked to reduced cognitive function, behavioural alterations and neurodegenerative diseases. Unfortunately, the available drugs for treatment of toxocariasis are with variable results. Mesenchymal stem cells (MSCs) have been used in animal models and clinical trials of tissue injuries and it gave promising therapeutic results. Therefore, this study was designed using 40 *T. canis*-infected albino mice (1000 eggs/mouse, orally) and an additional control group (GI) of 10 healthy mice. The infected mice were divided into four groups (n=10). GII was the infected non-treated group (infected control), GIII was treated with albendazole at a dose of 100 mg/kg/d once orally for 5 successive days, GIV was treated with bone marrow derived MSCs at a dose of 3x10⁶ MSCs in 0.1 mL of PBS via the tail vein, and GV was treated with albendazole + MSCs. Treatment was commenced 6 weeks p.i. and the experiment was terminated four weeks after administration of the last doses of the tested drugs. The brain tissue of each mouse was subjected for histopathological, immunohistochemical studies (caspase-3, TGF- β), detection of *T. canis* DNA by real-time PCR and gene expression the biomarkers of brain damage (S100B, GFAP) by RT-PCR. Moreover, homing of iron oxide-labelled MSCs in brain tissues was assessed by Prussian blue stain. The brain tissues of GII showed numerous *T. canis* larvae, significant congestion, thickening of arterioles, inflammatory infiltrate and gliosis associated with marked immunohistochemical expression of TGF- β and caspase-3 as well as marked S100B and GFAP gene expression. Significant improvements of the previous parameters and *T. canis* DNA were recorded in all the treated groups. However, the best results were obtained with combined albendazole + MSCs therapy. Thus, MSCs could be considered in the treatment of chronic neurotoxocariasis.

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