

Xenograft of microencapsulated Sertoli cells as a therapy for experimental Laron syndrome

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Introduction and Aim The only treatment of Laron Syndrome (LS), caused by an inherited defect in the gene encoding the GH receptor resulting in the failure to generate IGF-1, consists of chronic administration of recombinant human IGF-1 (rhIGF-1) that is burdened side effects. Moreover, this approach is limited by the restricted availability of this drug for clinical use (orphan drug) which dramatically lowers number of treatable cases. It is known that IGF-1 represents one of the main growth factors produced by Sertoli cells (SC). Aim of our work was to assess if transplantation of barium alginate microencapsulated SC (BaMCs) would induce normalization of clinical features of growth hormone deficiency in "Laron mice", the best animal model for human LS.

Materials and Methods BaMCs were prepared from pre-pubertal piglets, according to our method and examined as far as: (a) SC morphology by light microscopy; (b) SC viability, by fluorescence microscopy after staining with ethidium bromide and fluorescein diacetate (EB+FDA); (c) SC in vitro function (α -aromatase activity and IGF-I secretion); (d) evaluation of growth parameters in Laron transplanted mice were concerned.

Results BaMCs showed excellent features in terms of size, morphology, sphericity and coalescence. SC viability was very high (over 90%). Very good α -aromatase activity and IGF-I secretion were associated with the examined SC preparation. Intraperitoneal graft of BaMCs into Laron mice induced a significant increase in growth parameters in terms of weight and nose-to-anus length as compared to untreated controls.

Conclusions SC may be enveloped in BaMCs with no loss of their functional and morphological properties. Xenograft of BaMCs in Laron mice induced, an unprecedented, significant increase in growth parameters as compared to untreated controls. This result may open new perspectives for therapy of human LS.

Key words

Laron, Sertoli, transplantation