

عنوان مقاله:

Comparison of two methods for prolong storage of decellularized mouse whole testis for tissue engineering application: An experimental study

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نویسندگان:

Nasrin Majidi Gharenaz - *Anatomical Sciences Department, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran*

Mansoureh Movahedin - *Anatomical Sciences Department, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran*

Zohreh Mazaheri - *Basic Medical Science Research Center, Histogenotech Company, Tehran, Iran*

خلاصه مقاله:

Background: Biological scaffolds are derived by the decellularization of tissues or organs. Various biological scaffolds, such as scaffolds for the liver, lung, esophagus, dermis, and human testicles, have been produced. Their application in tissue engineering has created the need for cryopreservation processes to store these scaffolds. Objective: The aim was to compare the two methods for prolong storage testicular scaffolds. Materials and Methods: In this experimental study, 20 male NMRI mice (8 wk) were sacrificed and their testes were removed and treated with 0.5% sodium dodecyl sulfate followed by Triton X-100 0.5%. The efficiency of decellularization was determined by histology and DNA quantification. Testicular scaffolds were stored in phosphate-buffered saline solution at 4°C or cryopreserved by programmed slow freezing followed by storage in liquid nitrogen. Masson's trichrome staining, Alcian blue staining and immunohistochemistry, collagen assay, and glycosaminoglycan assay were done prior to and after six months of storage under each condition. Results: Hematoxylin-eosin staining showed no remnant cells after the completion of decellularization. DNA content analysis indicated that approximately 98% of the DNA was removed from the tissue ($p = 0.02$). Histological evaluation confirmed the preservation of extracellular matrix components in the fresh and frozen-thawed scaffolds. Extracellular matrix components were decreased by 4°C-stored scaffolds. Cytotoxicity tests with mouse embryonic fibroblast showed that the scaffolds were biocompatible and did not have a harmful effect on the proliferation of mouse embryonic fibroblast cells. Conclusions: Our results demonstrated the superiority of the slow freezing method for prolong storage of testicular scaffolds.

کلمات کلیدی:

Cryopreservation, Testis, Scaffold, Mouse, انجماد، بیضه، داربست، موش

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