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Comparative analysis of the skin decellularization methods

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Abstract

Background: The extracellular matrix plays an important role in the promoting the tissue regeneration and repair. Decellularization or removal of the cells from the complex mixture of the structural and functional proteins that constitute the extracellular matrix (ECM) can be done by the physical (agitation, sonication, freeze and thaw), chemical (alkaline orchids, ionic detergents, nonionic, tri-n-butyl phosphate (TBP), hypotonic or hypertonic treatments, chelating agents), and enzymatic methods (trypsin or protease inhibitors). However, complications associated with the use of the decellularized skin have been reported, which are widespread and poorly understood. In this synthesis have been included publications, identified by the Google Search engine, National Bibliometric Tool (NBT), Pub Med databases, Web of Science, Springer, Elsevier, Wiley Online Library, Science Direct and Biosience, Biotechnology and Biochemistry. The results of the decellularization were reported in terms of the number of cells remaining in the collagen fibers depending on the duration of exposure to chemical agents.

Conclusions: The natural matrix is more widely used than synthetic material, because it has the natural structure and composition of the ECM, it naturally stimulates cell development and allows the incorporation of the growth factors and other proteins increasing cell proliferation.The assessment of the quality of decellularization techniques is done by evaluating the necrosis of the extracellulare matrix, the depletion of the collagen fibers and the remaining amount of genetic material.

Key words: decellularization, extracellular matrix, cell proliferation.

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