

23. DECELLULARIZATION PROCEDURES OF THE ELEMENTS OF THE UMBILICAL-PLACENTAL COMPLEX

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Introduction. Due to its antifibrotic, anti-inflammatory and immunomodulatory properties, DAM (Decellularized amniotic membrane) has been used in multiple medical applications for over 100 years. Multiple decellularization methods that include combinations of physical, chemical, and enzymatic treatments are studied to ensure maintaining the structural and chemical integrity of the ECM (extracellular matrix) corresponding to the original tissue.

Aim of study. To evaluate the decellularization of the elements of the umbilical-placental complex, by various methods and to characterize the decellularization effect obtained.

Methods and materials. Amniotic membranes were manually separated, under sterile conditions, from three human placentas. A total of four decellularization procedures were used: 1% Triton X-100 solution; Triton X-100 1% solution + Ultrasound; 0.5% Dodecyl Sodium Sulfate (SDS) solution; 0.5% SDS solution + Ultrasound. Evaluation was done after 5 hours and 24 hours. DAM morphology was assessed by hematoxylin and eosin (H&E) staining.

Results. Histological images confirm that decellularization of AM with 0.5% SDS solution for 24 hours had a more aggressive influence on the structure of AM. Decellularization of AM with Triton 1% solution after 24 hours shows incomplete decellularization of AM. In the batch in which decellularization was performed with SDS 0.5% and SDS 0.5% solution + Ultrasound, already after 5 hours, the cells were completely removed, without affecting the structure of the ECM of AM.

Conclusion. The method of decellularization with 0.5% SDS solution is more suitable for AM decellularization and can be performed in only 5 hours, the use of ultrasound did not have a significant effect on the obtained results.