10 years of activity of the human tissue bank in the field of cornea sampling and processing from the Republic of Moldova

Cociug Adrian[2*], Macagonova Olga[1], Cusnir Valeriu[3], Nacu Viorel [1,2]
[1]Laboratory of Tissue Engineering and Cells Cultures, *Nicolae Testemitanu* State University of Medicine and Pharmacy.
[2]Human Tissue Bank, Traumatology and Orthopedics Clinical Hospital, Republic of Moldova.
[3]Department of Ophthalmology and Optometry, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova.

Introduction. The cornea is the window of the eye, allowing light to reach the sensory cells that allow us to see the world around us. In the TUB from the Republic of Moldova, the corneas with a long storage period are the lyophilized ones, with a period of 2 years, and those with a short period are kept in culture media (Tissu „C"), dehydration (Carry „C") and transport (Eusol „C") [1].
Material and methods. The conducted study presents the evaluation of cornea sampling, processing and validation in TUB over the 10-year period 2013 - 2022 for 395 corneas, from 202 donors (69.8% men, 30.2% women), with an average donor age of 59 .4 years (SD 18.3 years) and between 18 and 91 years. Donors were from forensic medicine (23.5%), public hospitals (67.6%) and multi-organ donors (7.1%). The most common causes of donor death were cardiovascular disease, trauma, and cerebrovascular disease. Invalidation of the cornea was in 25.4% of cases, of which they were determined by serological infections (HBsAg-positive, HCV-positive, HIV/AIDS) - 15%, and biological contamination occurred in 7.8% of the total donor cornea. In total (294 corneas), 74.6% of the processed corneal tissue was used for corneal transplantation (74.8% for penetrating keratoplasty, 2.1% for lamellar keratoplasty, and 1.3% for unspecified transplants) and 25, 4% (101 corneas) were destroyed [2].
Results. The corneas from TUB, during the period 2013-2022, were evaluated in a macro and microscopic study that determined 3 important groups: the first group (160 donors) up to 10 hours of sampling from death - the anterior surface of the cornea was most frequently determined cornea with edema of the epithelium, stroma absolutely "transparent, not thickened, rare short folds, very thin Descemetov membrane, endothelial layer is completely transparent, intact on the entire surface[5]. Areas with uniform redistribution of cells, preferentially at the edge of the cornea and the middle area. Density of endothelial cells being greater than 2800 cells / mm2, with moderate signs of polymegetism, cellular pleomorphism, being considered as indications for transfixing keratoplasty. The corneas from the second group (30 donors) - with the sampling period from 10 to 15 hours - the surface of the epithelium is slightly edematous, its integrity is not compromised (exception may be a minor mechanical desquamation). Stroma with initial signs of edema in the lower layers, not thickened, transparent. Descemet's membrane has a single smooth plica, located centro-radially; the endothelial layer is intact. The endothelial layer is arranged uniformly, with the persistence of the mosaic, slightly tumified, which counts 26 cells in a square that forms an average of 2600 cells per mm^2. The corneas from group III (12 donors) with the sampling period after 15 hours - edematous anterior epithelium, in some areas exfoliated with detachment of Bowman's membrane, sometimes mosaic desquamation is observed. The stroma is edematous throughout the layer, dull in color. Descemetov membrane has pronounced folds, the folds directed in different directions like "parquet floor" or "checkerboard". The endothelial layer is matte, interrupted along the contour of the envelopes that appear transparent. Microscopically, endothelial cells reach the figure of 2000 per mm^2[3].
Conclusions.1. The analysis of the clinical and socio-demographic factors of the donation process associated with the quality of the corneal tissue showed the importance of implementing TUB quality control programs, to promote the selection of good quality corneal tissues and guarantee a donation process with donor identification mechanisms, extraction, preservation and distribution of corneal tissue guided by best practices that aim to minimize the risk of compromising tissue quality.2. The quality of the corneal tissue is a fundamental factor for the success of transplantation and to guarantee good quality tissues, it is important that the time limits between death and enucleation, death and preservation, and enucleation and preservation are established by the TUB, in order to minimize the risks to which tissues are exposed due to chronological factors related to the sampling process. 3. The best quality of the cornea is that of group I, which had a sampling time of up to 10 hours, which defined the density of endothelial cells as 2800 cells / mm^2, with moderate signs of polymegetism, cellular pleomorphism, being considered as indications for transfixing keratoplasty.

Key words: evaluation, validation, cornea, quality.

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