days of graft storage. Implementing an additional post-preparation step in the eye bank to evaluate cell density before graft release for transplantation may help to reduce postoperative DMEK complications

18 A PORCINE CORNEA AND LAMELLAR TISSUE MODEL TO INVESTIGATE EFFECTS OF STORAGE CONDITIONS ON CORNEAL PRESERVATION

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Background Globally, more than 12 million people are awaiting corneal transplantation and cornea donor reduction has been observed since the outbreak of the COVID-19 pandemic, negatively influencing the availability of human corneas for research purposes as well. Therefore, the exploitation of ex vivo animal models in this field is of great value.

The present study aimed at the development of a novel experimental model of porcine cornea ex vivo and lamellar tissue preparation to investigate the effects of storage conditions on corneal preservation.

Methods Twelve fresh porcine eye bulbs were disinfected by immersion in 10 mL of 5% povidone-iodine under orbital mixing for 5 minutes at room temperature. The corneoscleral rims were dissected, and stored in Tissue-C (Alchimia S.r.l., n=6) at 31°C and in Eusol-C (Alchimia S.r.l., n=6) at 4°C up to 14 days.

The evaluation of Endothelial Cell Density (ECD) and endothelial mortality was performed using vital dye Trypan Blue staining (TB-S, Alchimia S.r.l.). Digital 1X pictures of TB-stained corneal endothelium were acquired and percentage of stained area was quantified using FIJI ImageJ software. ECD and endothelial mortality were determined at 0, 3, 7 and 14 days.

Medium turbidity detected by naked eye was considered as proof of tissue contamination.

Additionally, non-vital staining of the endothelium with Alizarin Red (AR) was performed and the endothelial morphology was investigated at Day 14 in both whole corneas and dissected endothelial lamellae.

Results The contamination rate of porcine corneas corresponded to <10% and 0% in Tissue-C and Eusol-C after 14 days, respectively.

Porcine corneas stored in Tissue-C and Eusol-C showed <10% and <20% mortality in Tissue-C and Eusol-C respectively at the end of storage.

Preliminary ECD determination (range 3700-4100 cells/mm2) at Day 0 aligned with data present in the literature (Meltendorf et al., Graefe's Arch Clin Exp Ophthalmol, 2007).

Whole cornea and dissected lamellae stained with TB and AR showed comparable endothelial morphology after incubation in Tissue-C and Eusol-C for 14 days. The lamellar tissue allowed endothelium morphology analysis at higher magnification compared to whole cornea.

Conclusion The presented ex vivo porcine model allows evaluation of the performance and safety of storage conditions. Future perspectives of this method will be the extension of the porcine corneas storage up to 28 days.

19 KILLING EFFICACY OF A NEW HYPOTHERMIC CORNEAL STORAGE MEDIUM KERASAVE AT 4°C AGAINST NINE MICRO- ORGANISMS FREQUENTLY FOUND IN DONOR CORNEAS

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Purpose The aim of the present study was to determine the killing efficacy of Kerasave (AL.CHI.MI.A Srl), a corneal cold storage medium provided with antimycotic tablet against nine contaminants associated corneal infections.

Methods The killing efficacy of Kerasave was determined after 0, 3 and 14 days of incubation at 4°C in Kerasave after inocumation of the medium with 10(5)–10(6) (CFU) of Candida albicans (CA), Fusarium solani (FS), Aspergillus brasiliensis (AB), Staphylococcus aureus (SA), Enterococcus faecalis (EF), Bacillus subtilis spizizenii (BS), Pseudomonas aeruginosa (PA), Enterobacter cloacae (EC) and Klebsiella pneumoniae (KP). Log10 reductions at different time intervals were determined by the serial dilution plating technique.

Results After 3 days, Kerasave induced the highest log10 decrease in the concentrations of KP, PA, CA and EC. The 2 log10 decrease was observed for SA and EF. The lowest log10 decrease was observed in BS, AB and FS concentrations. After 14 days, the microbial count of CA, FS, SA, EF, PA and EC further decreased

Conclusions Corneal cold storage medium Kerasave effectively reduced the microbial concentration of almost all tested mcir-oorganisms after 3 days and represents a valuable tool to control the microbial contamination of human donor corneas intended for trasnplantation.

20 FACTORS INFLUENCING THE DISCARD OF CLINICAL TISSUE AND NHSBT METHODS TO MAINTAIN A LOW DISCARD RATE

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Introduction NHS Blood and Transplant Tissue and Eye Services (TES) is a human multi-tissue, tissue bank supplying tissue for transplant to surgeons throughout the UK. NHSBT has two Eye Banks. These are NHSBT Filton, based in Bristol and NHSBT David Lucas Eye Bank, which is based in Speke Liverpool.

Materials and Methods NHSBT monitors our monthly discard rates with the aim to review for any patterns. Due to the NHSBT Eye Banks using a computer system called PULSE we can categorise all our discard for further analysis. Focusing on key areas such as Contamination, Corneal Assessment failure such as Low Endothelial Cell count, Medical deferrals and blood sample quality.

Results 2019- NHSBT Procured 5705 Eyes and Issued 4725. This is a discard rate of 19%

2020- NHSBT Procured 3725 Eyes and Issued 2676. This is a discard rate of 28%

2021- NHSBT Procured 4394 Eyes and Issued 3555. This is a discard rate of 19%

Based on the EEBA Statistical report of Eye Banking Activity in Europe for 2019- 42663 Eyes/Corneas in situ were