Conclusion The number of positive results for microorganisms was higher in the case of hypothermic corneas and the Bio-surveillance notifications were also a little bit higher in hypothermic corneas (2.25%) comparing to organ cultured corneas (0.64%). The management of an eye bank with both preservation systems is challenging with its advantages and disadvantages. The main disadvantage of hypothermic corneas is the risk of not detecting contaminations because the corneas are released without any definitive results but it is compensated by the fact that they allow us to respond to emergencies, tissue returns, apart from the economic aspect.

EEBA 2023 Session II – New Developments in Eye Banking; Tissue Engineering

P10-A128 TRENDING OF CONTAMINATION RATES ACROSS NHSBT EYE BANKS

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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.

NHSBT investigated all our corneas discard due to contamination with the aim to review for any patterns. NHSBT Eye Banks performs initial Microbiology sampling on all Corneas in Corneas in Organ Culture Media at 7 Days. Corneas undergo a 2nd Microbiology sampling the day after the cornea is transferred into dextran medium.

Materials and methods Any Microbiology positive media Identified pre-transplant are sent to NHSBT’s Microbiology Reference Laboratory (MSL) for Identification. Any organisms which are identified post-dispatch are sent to a Referral Laboratory for rapid Identification and Sensitivity/Specificity Testing.

Filton Eye Bank Contaminated Corneas in Organ Media: 2018- 28 (0.91%) 2019 -45 (1.10%), 2020- 27 (1.03%), 2021- 39 (1.41%), 2022- 43 (2.1%) (until 15/08/22).

Most common Identified Organisms: C.Ablicans C. glabrata C.paraphilolitis

- Contaminated In Dextran Pre-Transplant: 2018- 4 (0.17%) 2019 -6 (0.18%), 2020- 9 (0.46%), 2021- 0 (0%), 2022- 3 (0.3%) (until 15/08/22). Most common Identified Organisms: Bacillus species

- Contaminated in Dextran Post-Transplant: 2018- 0 (0%) 2019 -8 (0.23%), 2020- 2 (0.10%), 2021- 2 (0.08%), 2022- 1 (0.11%) (until 15/08/22). Most common Identified Organisms: Bacillus species

David Lucas Eye Bank: Contaminated Corneas in Organ Media: 2020- 20(1.8%), 2021- 37(1.96%), 2022- 21(1.4%) (until 15/08/22). Most common Identified Organisms: C.Ablicans C. glabrata C.Kefyr

- Contaminated In Dextran Pre-Transplant: 2020- 6(0.8%), 2021- 2(0.14%), 2022- 1(0.08%) (until 15/08/22). Most common Identified Organisms: Bacillus species

- Contaminated in Dextran Post-Transplant: 2020- 2 (0.26%), 2021- 1 (0.07%), 2022- 2 (0.16%) (until 15/08/22). Most common Identified Organisms: Bacillus species

Discussion Processes and facilities are of same standard between the two NHSBT Eye Banks and contamination rates are comparable. contamination is only identified in Approx1% of corneas processed. Corneas where growth is identified in Dextran is less than 1% of corneas Issued. Of the positive Microbiology samples identified post-Transplant, were mostly identified as Environmental Bacteria and had no patient impact on patient and assumed to have been contaminated by the operator.

P12-A107 PORCINE CORNEA EX VIVO MODEL AS AN ALTERNATIVE TO HUMAN DONOR TISSUES FOR INVESTIGATING NEW PRESERVATION CONDITIONS

1-UMBERTO RODELLA, 1LORENZO BOSIO, 1STEPFANO FERRARI, 2CLAUDIO GATTO, 3LAURA GIURGOLA, 2ONETTA ROSSI, 2STEPFANO CICILIO, 1EUGENIO RAGAZZI, 1DIEGO PONZIN, 1JANA D’AMATO TOTTOVÁ, 1FONDAZIONE BANCA DEGLI OCCHI DEL VENETO, ITALY, 2RESEARCH AND DEVELOPMENT, AL.CHI.MI.A. S.R.L, PONTE SAN NICOLÒ, ITALY, 3DEPARTMENT OF MOLECULAR MEDICINE, UNIVERSITÀ DI PAVIA, PAVIA, ITALY; 4DEPARTMENT OF PHARMACEUTICAL AND PHARMACOLOGICAL SCIENCES, UNIVERSITÀ DEGLI STUDI DI PADOVA, PADOVA, ITALY

Purpose Considering the growing shortage of corneal tissues for research, the present study aimed to develop and optimize a porcine cornea model with qualitative features comparable to those of human tissues.

Methods A new decontamination procedure of porcine eye bulbs was set up and its efficacy as well as endothelial mortality were evaluated. Human corneas unsuitable for transplant and porcine corneas were then compared after storage under hypothermic (4–8°C, Eusol-C, AL.CHI.MI.A. S.R.L) or organ-culture (31–35°C, Tissue-C, AL.CHI.MI.A. S.R.L) storage conditions for 14 days. A new method, based on the semi-automatic analysis of Trypan-blue stained endothelial areas by Fiji software, was developed to quantify the whole endothelium viability. Corneas were assessed for central corneal thickness (CCT), corneal transparency, endothelial morphology, and endothelial cell density (ECD) at days 0, 7, and 14 of storage. Portions of lamellar tissues consisting of Descemet’s membrane and endothelial cells were prepared for histological investigations.

Results The new decontamination procedure of porcine eye bulbs resulted in 18% versus 89% (‘no decontamination’ control) of corneas still contaminated after 28 days of storage at 31°C. The decontamination protocol did not affect endothelium viability, as assessed by the new Fiji-based method. ECD (porcine: 3156 ± 144 cells/mm2; human: 2287 ± 152 cells/mm2), CCT (porcine: 1073 ± 151 μm; human: 581 ± 39 μm), transparency (porcine: 88.6 ± 11.0%; human: 76.3 ± 5.4%), and morphology score (porcine: 4.0 ± 0.0; human: 3.2 ± 0.4) measured in the porcine cornea at day 0 were significantly higher than in human corneas. Nonetheless, the qualitative parameters of porcine and human corneas showed comparable trends during the storage under hypothermic (4–8°C) and organ-culture (31–35°C) conditions for 14 days.

Conclusion The presented porcine cornea model represents a reliable and alternative model to human donor tissues for research.