Letter to the Editor

Unaddressed Factors and Their Role in DMEK Outcomes: Clinical Outcomes of Descemet Membrane Endothelial Keratoplasty Using a Preloaded Imported Graft

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Dear Editor,

We read with interest the paper by Kim et al. 1 reporting Korea’s first long-term clinical outcomes of Descemet membrane endothelial keratoplasty (DMEK). Since DMEK has emerged as the preferential endothelial keratoplasty technique there is increasing importance to investigate and report the outcomes from different centres and techniques.

Several factors are known to influence DMEK graft performance and patient outcomes. Our concern is that many of these are not considered by the authors of this paper and may be key in explaining the study’s high rebubbling rate (25%) and low endothelial cell density (ECD) at 24 months. An existing association has been made between lower ECD, which could stem from the unaddressed factors, and rebubbling which may lead to graft failure.2

Reporting donor characteristics is essential and would strengthen the authors’ conclusions. Younger graft donors (typically under 50 years) provide healthier endothelial cells and a higher ECD preoperatively and postoperatively offering better visual outcomes.3 Although older donors may still be suitable; the grafts are stiffer, requiring more intraoperative manipulation leading to lower ECD and higher rebubbling and failure rates.3 Donor comorbidity is a critical factor influencing graft performance. Diabetes reduces donor ECD and graft preparation is more difficult, potentially causing more endothelial cell damage; ultimately, fewer endothelial cells are transplanted, leading to poorer patient outcomes.4 Other donor characteristic factors that can affect DMEK success not considered in this paper include previous cataract surgery, race, and gender.3

Preparation and transportation timings are critical to DMEK outcomes. The authors neglect to mention the graft peel time, a shorter peel time reduces the exposure of endothelial cells to potential damage affecting graft outcomes.5 The authors mention a delay between graft preparation, overseas shipping, and surgery of approximately 6–8 days. Specificity is crucial here to allow a full assessment of the DMEK performance. Time-in-preservation is another important consideration overlooked, prolonged time-in-preservation increases exposure to transportation media and potential damage to endothelial cells.5 Additional timing considerations include death-to-preparation and death-to-transplantation.

Graft preparation is fundamental to DMEK’s success. Although not explicitly stated the authors imply that the grafts are prestripped and preloaded at the eye bank rather than in surgery. This distinction is key since grafts stripped and loaded in surgery are associated with lower rebubbling rates.5

Regarding graft transportation, providing the graft storage time in the respective media would provide insight into the potential effects on graft performance including graft-to-recipient adhesion and rebubbling rates.2
The findings of this paper valuably contribute to the evolving DMEK field. However, the lack of details regarding donor characteristics and graft preparation limits the ability to compare the results to former preloaded DMEK studies. The addition of these would allow for a more comprehensive understanding of DMEK's performance in Korea.

REFERENCES


Clinical outcome of Descemet’s membrane endothelial keratoplasty (DMEK) from preloaded imported graft

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My co-authors and I appreciate your interest in our study and we are pleased to respond to the comments.

Overall, I agree with your opinions. I believe that obtaining outcomes of Descemet membrane endothelial keratoplasty (DMEK) considering the characteristics of donors would provide valuable evidence for surgeons in selecting donors in the future.

Recently, we have been performing DMEK by preparing the endothelium in the operating room rather than preloaded DMEK. As you suggested, we aim to predict potential damage to endothelial cells caused by exposure during the preload process and compare outcomes. We plan to publish a paper comparing the two methods in the future, so we hope for your keen interest.

Furthermore, we have been measuring the pH of storage media (Optisol-GS) in which the donor was stored. If we can compare the pH of Optisol, donor preservation time, and outcomes, as you advised, we will be able to consider potential risk factors influencing DMEK outcomes.

Although our study lacks many donor factors in analyzing preloaded DMEK outcomes, it remains the only study in Korea to comprehensively analyze DMEK outcomes on this scale. Our study will serve as an important foundation for verifying DMEK outcomes in Korea, and we plan to introduce studies that can provide a comprehensive understanding of DMEK outcomes by analyzing additional factors as mentioned above.