



# Is sex a biological variable in corneal wound healing?

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## Background and Rationale

- The cornea is vulnerable to trauma, injury, or infection resulting in loss of corneal clarity and vision.
- Restoration of corneal transparency and sharp vision depends on a wound healing process controlled by several factors.
- Significant tissue-dependent wound healing differences between men and women have been reported in various human clinical studies.
- Dermal wound healing was shown to be faster in women than in men, while wound healing in mucosal tissues was superior in men.
- The role of sex in corneal wound healing is still unknown.

## Hypothesis and Objective

- We hypothesized that sex plays a minimal role in corneal wound healing *in vivo*.
- The objective of this study was to determine the role of sex in corneal wound healing *in vivo* using an established chemical-wound model employing male and female rabbits.

## Results

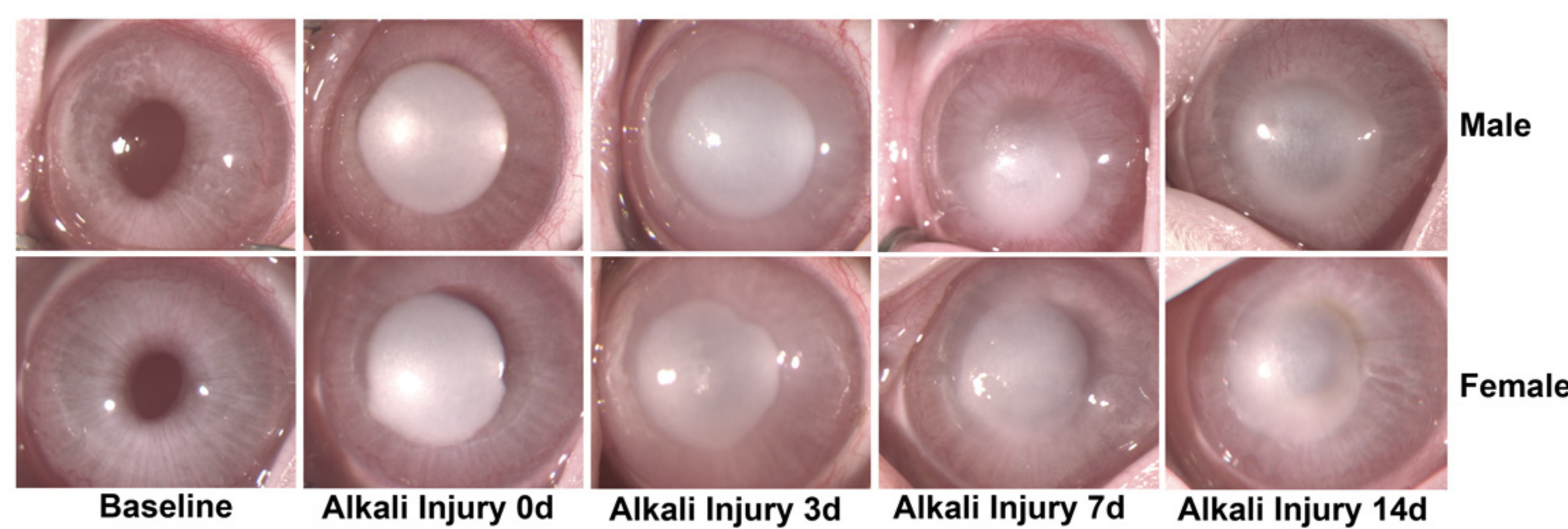


Fig. 1. Stereo-imaging examination indicated a Fantes score of male = 3 and female = 3 on day 14 after alkali injury.

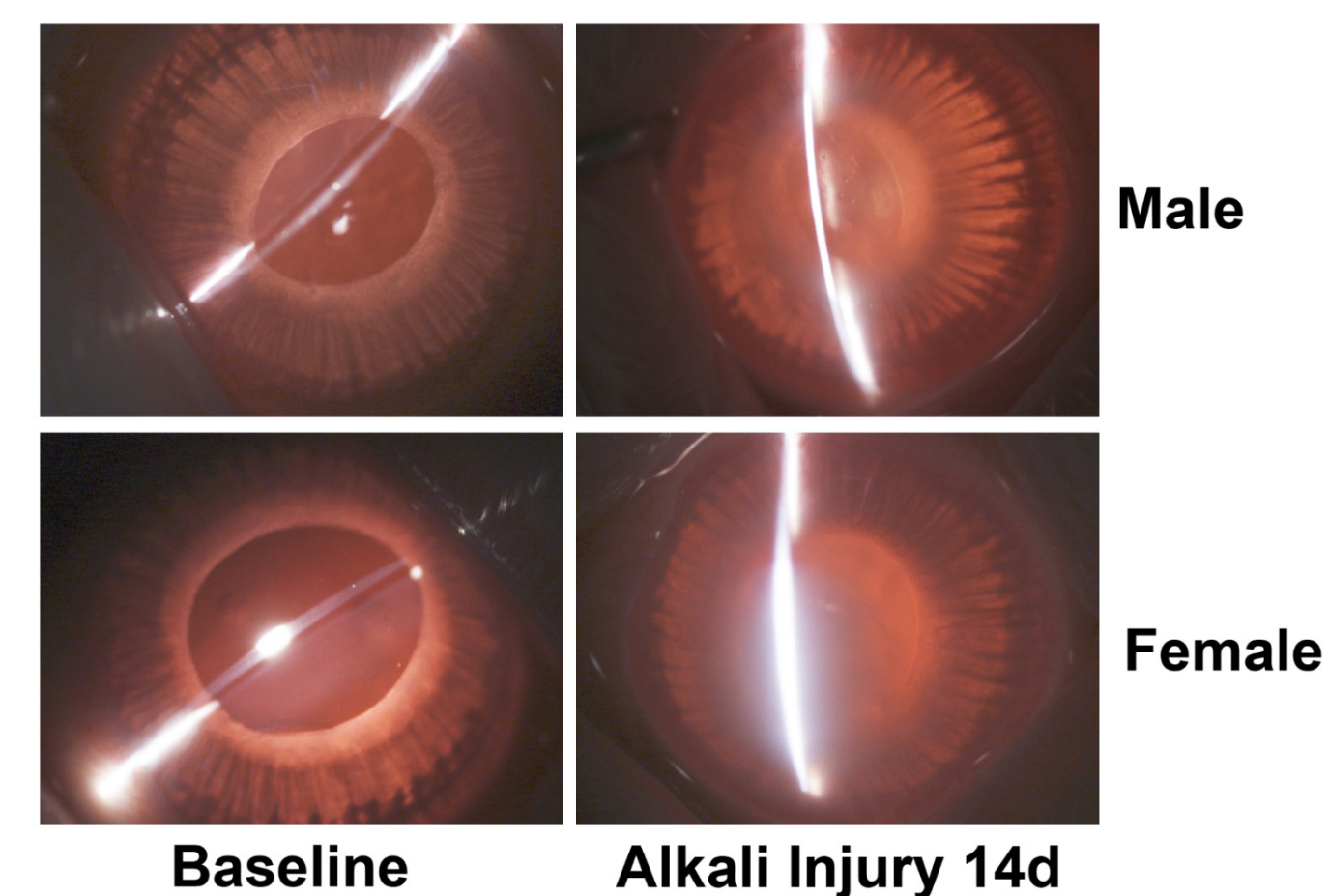


Fig. 2. Slit-lamp examination indicated the presence of inflammation 14 days after alkali injury.

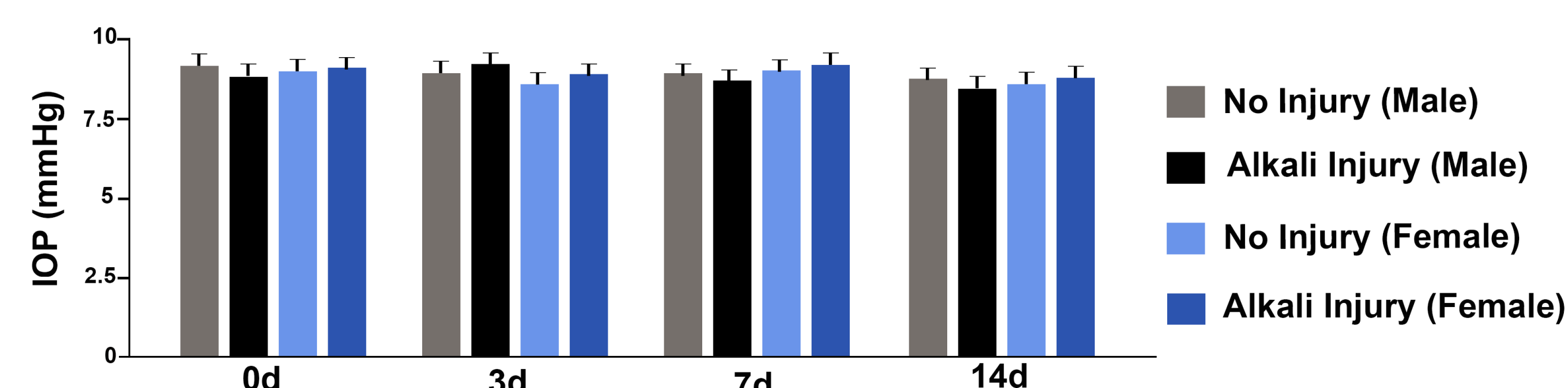


Fig. 3. Average intraocular pressure measurements were male = 9.5 mmHg and female = 9.5 mmHg.

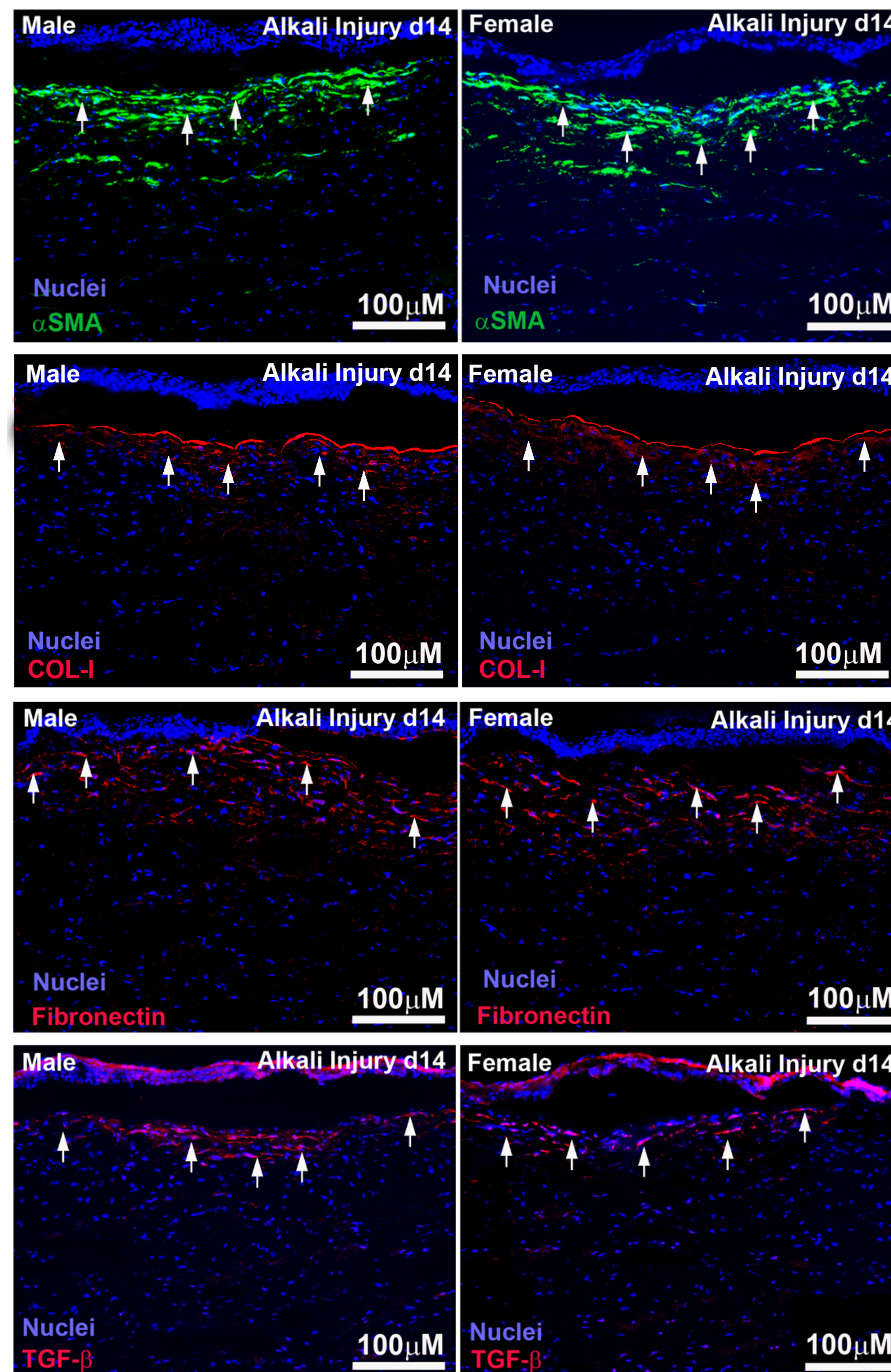


Fig. 4. Immunohistochemistry (IHC) of the collected corneal tissues showed similar levels of expression and localization of  $\alpha$ -SMA, COL-I, Fibronectin, and TGF- $\beta$  between male and female rabbits.

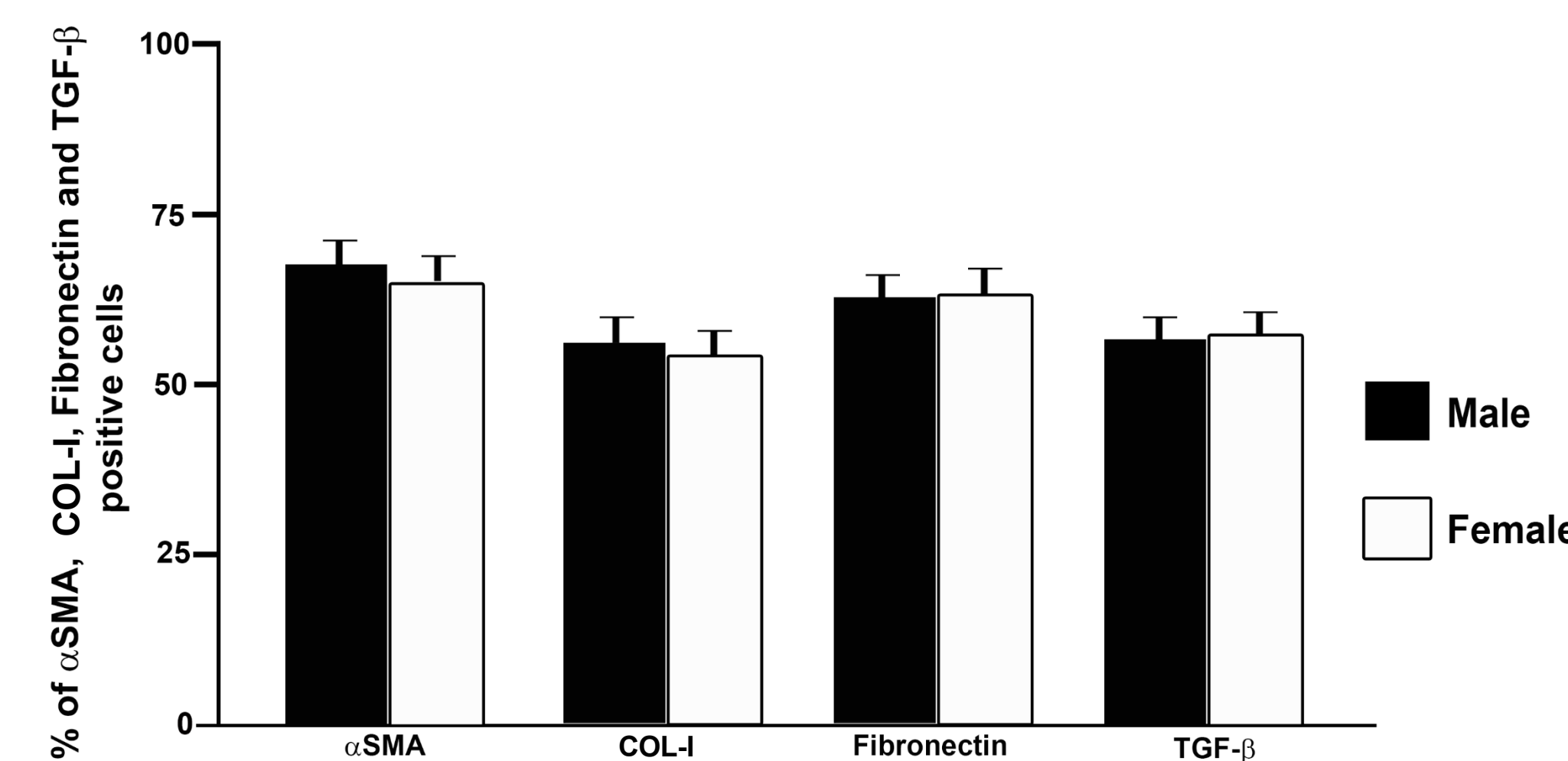


Fig. 5. Quantification of the number of cells which stained positively for  $\alpha$ -SMA, COL-I, Fibronectin, and TGF- $\beta$  in IHC images showed similarities between male and female rabbits.

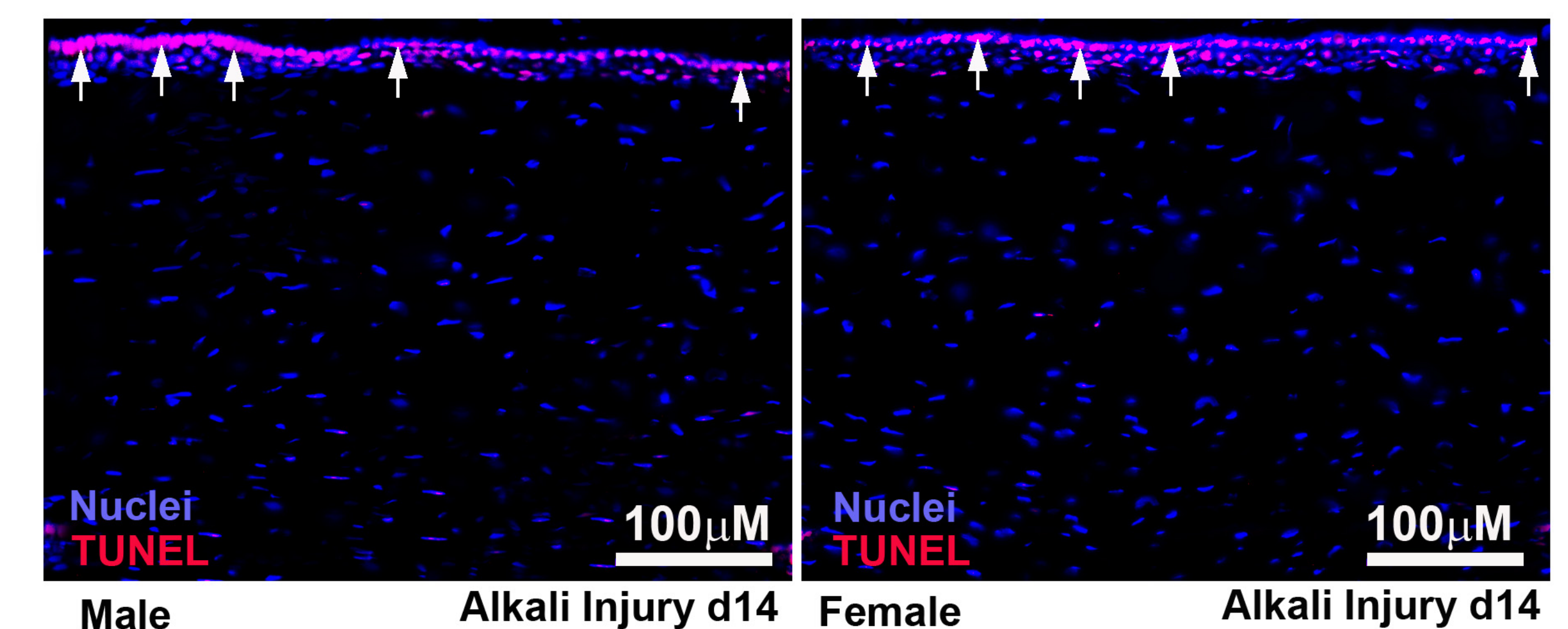


Fig. 6. TUNEL assay of the corneal tissues showed similar levels of apoptotic cells in male and female rabbits.

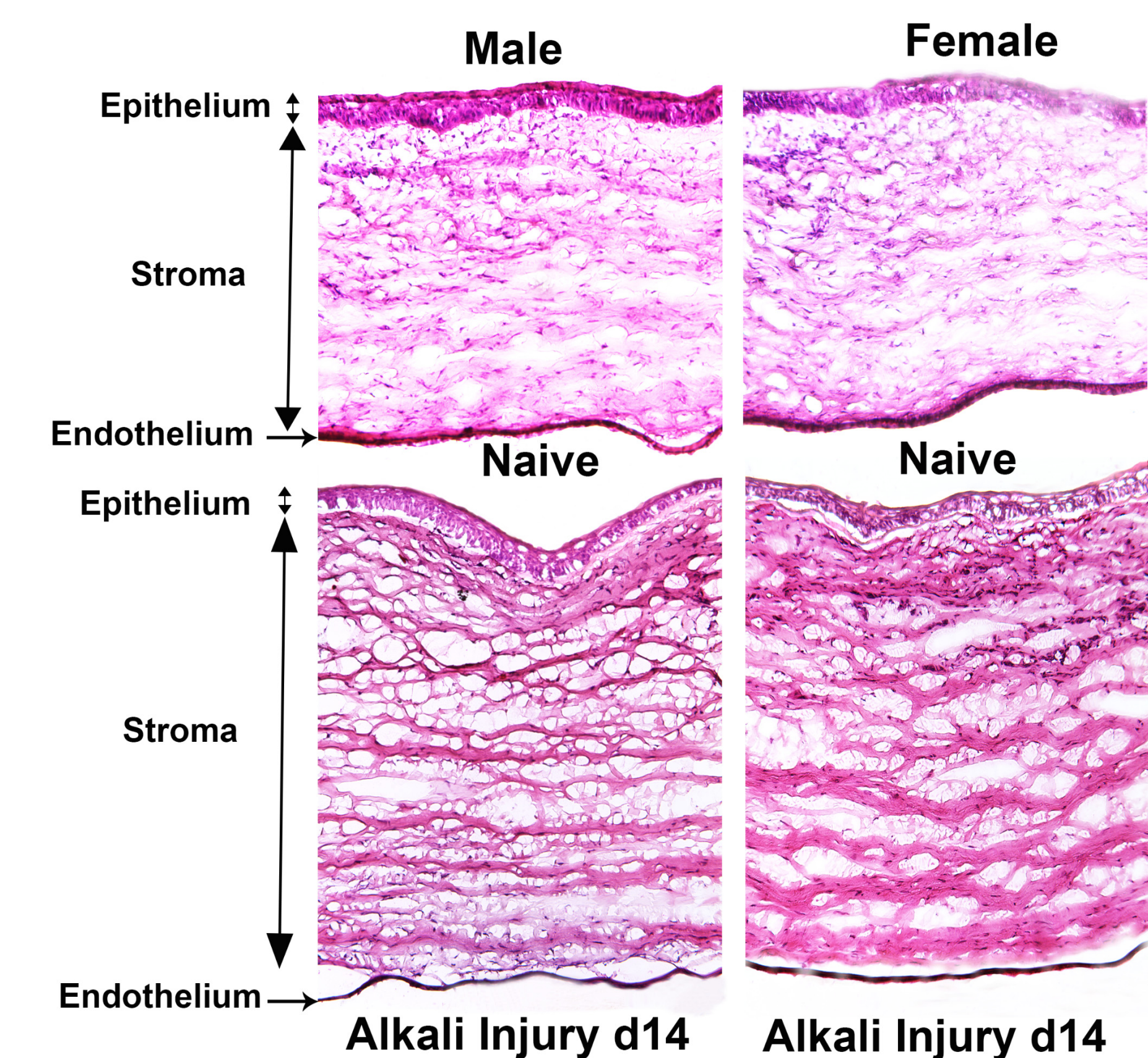


Fig. 7. Hematoxylin and eosin staining of the corneal tissues showed minimal differences between male and female rabbits.

## Conclusions

- The clinical imaging and histological data collected thus far suggest that sex plays a limited role in corneal wound healing.
- Quantification of RNA levels of  $\alpha$ -SMA, COL-I, Fibronectin, and TGF- $\beta$  in the wounded rabbit corneas are underway.
- Full analysis of pending studies is warranted.

## Acknowledgments

- Ruth Kraeuchi Missouri Ophthalmology Endowment Fund (RRM) primarily supported the study.
- National Eye Institute (RO1EY17294), NIH, Bethesda MD (RRM) partially supported the study.
- Veteran Health Affairs Merit (1101BX00035701), Washington DC (RRM) partially supported the study.
- Mizzou Advantage initiative in One Health/One Medicine provided a stipend to Hannah Gafen for the study.