



CORRESPONDENCE

Comment on: “What are the costs, capacity, and clinical implications of “waiting for documented progression” in young West of Scotland patients prior to collagen cross linking?”

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TO THE EDITOR

We read with interest the article: “What are the costs, capacity, and clinical implications of ‘waiting for documented progression’ in young West of Scotland patients prior to collagen cross linking (CXL)?” [1], where the authors investigated this policy, suggesting possible revision, with all under 21 being offered CXL at presentation [1]. We feel such conclusions are unsupported, raising good medical practice issues.

Chronic trauma is a risk factor for keratoconus and progression [2]. Stopping rubbing and treating its causes should be instigated at first visit [2], may be sufficient to arrest progression, and must continue, otherwise CXL can be ineffective [3]. It is imperative to commence such measures, including treating atopy/inflammatory disease to allow accurate tomographic measurements and reduce post-operative inflammatory sequelae, and evaluate response to treatment before CXL. The authors do not mention how many patients were eye rubbers, had ocular surface disease or how they addressed such problems, limiting the interpretation of their paper.

The authors discuss silent progression. However, the reverse can be true with limitations in tomographic measurement repeatability, especially in advanced cases and untreated ocular surface disease. The authors do not define criteria for progression or protocols for ensuring accurate tomography/topographic measurements, preventing meaningful interpretation of their findings and conclusions.

Sight-threatening events occur post-CXL [4], including delayed progressive/extreme corneal flattening [5], raising ethical issues concerning proceeding before risk factors for progression have been addressed and need for surgery documented. The authors do not model, how cost savings of immediate CXL would be negated by costs of unnecessary procedures, (a possible rate of 50% in their paper, with 28 potentially unnecessary cases compared to 56 performed [1]), post-operative visits and management of complications, so that their cost assumptions are unsupported. To address out-patient costs, telemedicine using remote technician-based clinics, with strict criteria for optimising and ensuring accuracy of tomographic measurements, can minimize the cost issues of close follow-up, help avoid visual loss and be tailored to minimize breaks from education/work.

Keratoconus is heterogenous with genetic and environmental influences and individual socioeconomic considerations. A tailored approach is good medical practice, where factors including rubbing, atopy, psychiatric disorders, genetics, and compliance are taken into consideration. To come to meaningful conclusions, we require evidence-based risk stratification for keratoconus progression. This may then scientifically justify immediate CXL in some patient groups (probably a minority with advanced disease, approaching the

thickness threshold for treatment). Age is an important, but it is not the sole factor. Indeed, the authors present data to support progression in those with advanced disease, thinner corneas and higher keratometry measurements.

The current evidence does not support rushing into CXL without treating risk factors for progression, documenting need for surgery in a procedure with sight-threatening complications and where follow-up >10 years is limited, which by the authors own evidence might be unnecessary in 50% (a very good argument in itself for not treating all patients under 21), and notwithstanding the post-operative pain, slow visual recovery (weeks), time away from education and psychological trauma of the procedure itself.

David O’Brart^{1,2}, Mehran Zarei-Ghanavati³

Alfonso Vasquez-Perez⁴ and Christopher Liu^{5,6,7}✉

¹Guy’s and St. Thomas’ Hospital NHS Foundation Trust, London, UK.

²King’s College London, London, UK. ³Farabi Eye Hospital, Tehran University of Medical Sciences, Tehran, Iran. ⁴Moorfields Eye Hospital NHS Foundation Trust, London, UK. ⁵Sussex Eye Hospital, Brighton, UK. ⁶Brighton and Sussex Medical School, Brighton, UK. ⁷Tongdean Eye Clinic, Hove, UK. ✉email: CSCLiu@aol.com

REFERENCES

1. Simpson A, Brogan K, Ramaesh K, Lockington D. What are the costs, capacity, and clinical implications of ‘waiting for documented progression’ in young West of Scotland patients prior to collagen cross linking? *Eye* (Lond). 2021:1–3.
2. Gatineau D. Eye rubbing, a Sine Qua Non for keratoconus? *Int J Kerat Ect Cor Dis*. 2016;5:6–12.
3. Elmassry A, Said Ahmed OI, Abdalla MF, Gaballah K. Ten years experience of corneal collagen cross-linking: an observational study of 6120 cases. *Eur J Ophthalmol*. 2020;1120672120928921. <https://doi.org/10.1177/1120672120928921>. Online ahead of print.
4. Evangelista CB, Hatch KM. Corneal collagen cross-linking complications. *Semin Ophthalmol*. 2018;33:29–35.
5. Padmanabhan P, Belin MW, Padmanaban V, Sudhir RR. Extreme corneal flattening following collagen crosslinking for progressive keratoconus. *Eur J Ophthalmol*. 2020. <https://doi.org/10.1177/1120672120947664>

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

Correspondence and requests for materials should be addressed to C.L.

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