

# Assessment of Preoperative Risk Factors for Post-LASIK Ectasia Development [Response to Letter]

Mohamed Tarek El-Naggar<sup>1</sup>, Rania Serag Elkitkat<sup>2-5</sup>, Hossam El-din Ziada<sup>6</sup>, Louise Pellegrino Gomes Esporcatte<sup>7-9</sup>, Renato Ambrósio Jr<sup>7-11</sup>

<sup>1</sup>Refractive Surgery Unit, Ophthalmology Department, Research Institute of Ophthalmology, Giza, Egypt; <sup>2</sup>Ophthalmology Department, Faculty of Medicine, Ain Shams University, Cairo, Egypt; <sup>3</sup>Watany Eye Hospital, Cairo, Egypt; <sup>4</sup>Watany Research and Development Center, Cairo, Egypt; <sup>5</sup>Ophthalmology Department, Modern University for Technology and Information, Cairo, Egypt; <sup>6</sup>Cornea and Refractive Surgery Unit, Ophthalmology Department, Faculty of Medicine, AL-Azhar University, Cairo, Egypt; <sup>7</sup>Rio de Janeiro Corneal Tomography and Biomechanics Study Group, Rio de Janeiro, Brazil; <sup>8</sup>Instituto de Olhos Renato Ambrósio, Rio de Janeiro, Brazil; <sup>9</sup>Department of Ophthalmology, Federal University of São Paulo, São Paulo, Brazil; <sup>10</sup>Brazilian Study Group of Artificial Intelligence and Corneal Analysis - BrAIN, Rio de Janeiro & Maceió, Brazil; <sup>11</sup>Department of Ophthalmology, Federal University of the State of Rio de Janeiro (UNIRIO), Rio de Janeiro, Brazil

Correspondence: Mohamed Tarek El-Naggar, Email [drtarekelnaggar@hotmail.com](mailto:drtarekelnaggar@hotmail.com)

## Dear editor

First, we thank Dr. Navarro-Naranjo and his colleagues for their collaboration and interest in our ectasia study.<sup>1</sup> In their letter, they mentioned some inaccuracies reported in our study related to the calculation of the NICE. We must respectfully disagree as we present [Table 1](#), which includes the clinical data from the parameters considered in the NICE index. These data support the published NICE results in which 62.5% of the eyes (15 out of 24) presented with a

**Table 1** NICE Clinical Parameters and Calculation

Clinical Data					NICE Index Calculation				
Patient	K2 (D):	EP	Pachy	IS	K2	EP	Pachy	IS	Total
1	44.1	11	539	0.37	1	1	1	1	4
2	45	17	508	-0.18	2	2	2	1	7
3	46.6	11	501	0.61	2	1	2	1	6
4	46.7	13	507	0.61	2	1	2	1	6
5	46.4	17	491	0.16	2	2	3	1	8
6	47.3	18	490	0.16	3	3	3	1	10
7	45.4	9	492	0.75	2	1	3	1	7
8	43.6	8	527	0.75	1	1	1	1	4
9	44.6	7	516	0.87	1	1	2	1	5
10	44.2	10	527	0.87	1	1	1	1	4
11	41.8	3	567	-0.86	1	1	1	1	4
12	43.9	9	591	0.3	1	1	1	1	4

(Continued)

Table 1 (Continued).

Clinical Data					NICE Index Calculation				
Patient	K2 (D):	EP	Pachy	IS	K2	EP	Pachy	IS	Total
13	43.8	10	585	0.12	1	1	1	1	4
14	43.6	21	580	0.12	1	3	1	1	6
15	42.2	13	533	0.93	1	1	1	1	4
16	42.6	13	523	0.93	1	1	1	1	4
17	45	5	527	0.53	2	1	1	1	5
18	44.5	10	515	0.53	1	1	2	1	5
19	44.1	8	530	1.19	1	1	1	2	5
20	44.9	12	539	1.19	1	1	1	2	5
21	44.9	10	538	0.76	1	1	1	1	4
22	45.2	10	542	0.76	2	1	1	1	5
23	44.7	9	479	1.27	1	1	3	2	7
24	45	10	494	1.27	2	1	3	2	8

**Note:** Red shaded values= Index value 5 or more.

score higher than 5.<sup>1</sup> Based on their criteria, these scores would contraindicate for LASIK.<sup>2</sup> Interestingly, the remaining nine eyes had a score of 4. While reducing the cut-off would make the sensitivity of 100%, this would also impact the specificity of the criteria.

We agree that a subjective classification may change the criteria of some cases. Nevertheless, while any refractive surgeon should master the interpretation of color-coded curvature maps, the limitations of such subjective classification are relevant. In a previous study that evaluated the subjective classification from 11 experient examiners on 25 cases, high inter-observer variability was observed in the subjective classifications using the same scale. Moreover, the study also found significant intra-observer variability, with eight of the eleven examiners presenting statistically different categories from the maps presented with the Klyce/Smolek 1.5D absolute scale and the 0.5D Holladay (classic Eye Sys red-to-blue) normative scale.<sup>3</sup> Differences in calculating the NICE index are expected, considering the subjective classifications.

We agree with Navarro-Naranjo et al in their letter that multimodal diagnostics, beyond front surface topography and 3-D tomography, is essential to augment the safety and efficiency of refractive surgery.<sup>4</sup> Corneal biomechanical assessment, integrated with tomography with artificial intelligence, aims to characterize the corneal predisposition or susceptibility to biomechanical decompensation.<sup>4,5</sup> This concept goes beyond, but not over, the detection of mild or subclinical (fruste) cases of keratoconus. The BrAIN (Brazilian Artificial Intelligence Networking in Medicine) ectasia software combines with AI the intrinsic predisposition and the extrinsic impact of the corneal procedure to objectively characterize ectasia risk (<https://brain.med.br/>).

## Disclosure

The authors report no conflicts of interest in this communication.

## References

1. El-Naggar M, Elkitkat R, Ziada H, Pellegrino L, Ambrosio R. Assessment of preoperative risk factors for post-lasik ectasia. *Clin Ophthalmol*. 2023;17:3705–3715. doi:10.2147/OPTH.S425479

2. Navarro PI, Torres Y, Bareño J Índice acumulativo de riesgo para tamizaje de candidatos a cirugía corneal refractiva con excimer laser. Editorial Académica Española EAE; 2016. Available from: [www.morebooks.de](http://www.morebooks.de). Accessed April 03, 2024.
3. Ramos IC, Correa R, Guerra FP, et al. Variability of subjective classifications of corneal topography maps from LASIK candidates. *J Refract Surg*. 2013;29(11):770–775. PMID: 23980708. doi:10.3928/1081597X-20130823-01
4. Ambrósio R, Salomão MQ, Barros L, et al. Multimodal diagnostics for keratoconus and ectatic corneal diseases: a paradigm shift. *Eye Vis*. 2023;10(1):45. doi:10.1186/s40662-023-00363-0 PMID: 37919821; PMCID: PMC10623885.
5. Ambrósio R, Machado AP, Leão E, et al. Optimized artificial intelligence for enhanced ectasia detection using scheimpflug-based corneal tomography and biomechanical data. *Am J Ophthalmol*. 2023;251:126–142. PMID: 36549584. doi:10.1016/j.ajo.2022.12.016

Dove Medical Press encourages responsible, free and frank academic debate. The content of the Clinical Ophthalmology 'letters to the editor' section does not necessarily represent the views of Dove Medical Press, its officers, agents, employees, related entities or the Clinical Ophthalmology editors. While all reasonable steps have been taken to confirm the content of each letter, Dove Medical Press accepts no liability in respect of the content of any letter, nor is it responsible for the content and accuracy of any letter to the editor.

## Clinical Ophthalmology

Dovepress

### Publish your work in this journal

Clinical Ophthalmology is an international, peer-reviewed journal covering all subspecialties within ophthalmology. Key topics include: Optometry; Visual science; Pharmacology and drug therapy in eye diseases; Basic Sciences; Primary and Secondary eye care; Patient Safety and Quality of Care Improvements. This journal is indexed on PubMed Central and CAS, and is the official journal of The Society of Clinical Ophthalmology (SCO). The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/clinical-ophthalmology-journal>