A need to maximize updates on detecting keratoconus

I am honored to serve as the Associate Editor-in-Chief of the *Saudi journal of ophthalmology*, and it is my privilege to welcome you to the inaugural edition of the "Keratoconus Special Issue." I am grateful to the Executive Board of the Saudi Ophthalmological Society (SOS) and the Editor-in-Chief of this flourishing ophthalmic journal, for entrusting and allowing me to lead the first issue of 2022. A special issue provides an excellent opportunity to review a particular theme, adopt new technologies for imaging the human eye, propose and develop new approaches, exchange perspectives, and encourage new lines of research that align with Saudi 2030 vision to push the wheel of health-care education and ensure the continued development of health-care services.

In November 2021, SOS issued its historical decision to permit, for the first time, establishing the formal forum for more than 130 cornea and refractive specialists in Saudi Arabia, the Saudi group of the cornea and refractive surgery "SGCRS." After all, the cornea is the clear front surface of the eye, and pathologies affecting it may lead to blindness or visual disabilities. Keratoconus (KC) does not cause blindness as such but can lead to disabling vision loss and impairment of vision-related quality of life. In addition, the economic burden of the lifetime treatment of KC represents a significant public health concern. This issue contains five review articles, which are essential to equip yourself with important new progress that has been made over the past 2–3 decades in detecting and treating the most common ectatic corneal disease, and are written by leaders in the field.

KC has been studied for decades. A German professor, Burchard Mauchart, first described KC in a doctoral dissertation in 1748. He described it as "Staphyloma Diaphanum." However, John Horner, a Swiss physician, gave the condition its modern name, KC, in 1869. The word is from the Greek kéras meaning cornea and the Latin cōnus meaning cone.[1] The collaborative longitudinal evaluation of KC study was the first optometry-based, multicenter, natural history study of 1209 patients with KC who were examined annually for 8 years in the United States of America.[2] Currently, there are no large-scale ethnic epidemiological similar studies in Asia for KC. We begin our issue with a review article on "KC epidemiology." Gomes *et al.*[3] summarize the most relevant epidemiological studies on KC, and describe its characteristics and risk factors, correlating them with its pathogenesis. Authors describe that the disease affects up to 5% of the population in some regions of the world, such as the Middle East.

A lack of absolute clarity regarding the factors that initiate and drive the progression of KC poses a significant challenge in its prevention and management. Lalgudi and Shetty in their review article focus on the most important concepts in the field of biochemical/molecular markers in the field of KC and their potential applications in clinical care.[4] They emphasize that novel biomarker kits which can provide levels of various cytokines from a drop of tear fluid as a point-of-care diagnostic are in development, and this will revolutionize the ability to test several biomarkers in a simple clinic setting without the need for complex laboratory setups.

There has been a recent surge of interest in assessing corneal biomechanical properties due to the availability of many instruments (e.g., ocular response analyzer, Corvis ST, and Brillouin optical microscopy), which meaningfully adds to the multimodal diagnostic armamentarium. Ambrosio *et al.*[5] provide an excellent comprehensive review of "Corneal Biomechanics for Corneal Ectasia." The authors stress the importance of integrating the tomographic and biomechanical data into artificial intelligence techniques to increase the accuracy to detect ectatic disease and characterize the inherent susceptibility for ectasia progression.

Increasing cases of KC with relatively earlier onset and greater disease progression have been emerging from certain Asian and non-Asian ethnicities, particularly Indians, Pakistanis, Middle Easterners, and Polynesians, compared with white populations.[6] Epithelial thickness mapping can detect KC earlier than front surface topography and also exclude KC in cases with suspicious back surface elevations, as described by Reinstein *et al.*[7] in their review article "Applications of Epithelial Thickness Mapping in Corneal Refractive Surgery."

The first successful corneal transplantation to treat KC was done in 1936 by Castroviejo.[8] It is estimated that 10%–20% of KC patients eventually undergo full-thickness corneal transplantation.[9] Between 1983 and 2002, 20.5% of corneal transplantation was performed for KC in a tertiary hospital in SA.[10] However, this percentage increased between 2003 and 2011, to become 53.1%. Busin *et al.*[11] provide an update on lamellar keratoplasty for KC. The authors cover three key aspects: the rapidly changing techniques of modern lamellar surgery, the current evidence on the clinical outcomes and complications, and the possible future developments in this evolving specialty.

Equally important is the need for more cornea studies in this region of the world, including genetic studies to allow for the identification and wiring of the genetic risk factors of KC, thus setting the foundation for future patient prediction or target discovery platforms.

Finally, I thank the authors and the reviewers for their hard work in bringing this issue to you. I also thank Dr. Muhammad

Ahad for his major contribution to reviewing and planning. I share your passion for this remarkable corner of the KC. Enjoy!

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