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Tej Kohli Foundation moves one step closer to cure blindness

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Technology being developed aims to bridge the gap between the high cost of treatment for corneal blindness and the unmet medical need in poor communities worldwide

The Tej Kohli Foundation has moved one step closer to a non-surgical treatment for corneal blindness as it prepares to enter into collaboration with researchers in Montreal, Canada and Moorfields Eye Hospital, UK to develop the Foundation's recently acquired proprietary technology into an injectable biosynthetic 'glue-filler'.

The biosynthetic solution is a liquid form that sets as a gel at body temperature and which can then be modified to act as a tissue glue. The biosynthetic material has the potential to seal corneal perforations and cause the regeneration of corneal tissue, which would eliminate the need for corneal transplant surgery and reduce the risk of rejection.

Like a cavity in a tooth, the 'filler' will be applied after the pathological tissue is removed, and can be used to fill a corneal perforation and regenerate the cornea in patients that would otherwise require a corneal transplantation.

Between January 2016 and November 2019, the Tej Kohli Cornea Institute in Hyderabad – a collaboration between the Tej Kohli Foundation and the LV Prasad Eye Institute - collected 38,255 donor cornea and completed 43,255 surgical procedures for patients who could not otherwise afford to access treatment. A large proportion of surgeries were vision-restoring corneal transplants using donor cornea. But relying on donor cornea has many limitations.

India, the country with the world's largest corneal blind population, needs 100,000 donor corneas annually, but only 17,000 eyes are being procured every year. This shortage of donors, combined with the prohibitive $4,000 cost of invasive corneal transplant surgery and the medicines needed to prevent graft rejection, has created an unmet medical need in many poor communities around the world, where curable blindness often goes untreated.

The Tej Kohli Foundation has a long-standing interest in technologies that can be developed into a scalable, affordable and accessible treatment that can bridge the gap between the high cost of treatment and the unmet medical need in poor communities.For a solution to be viable and affordable in poor communities the Foundation believes that it must cost less than $500.

The biosynthetic technology was developed as the result of years of collaborative research among ophthalmology departments in Montreal, Canada; Hyderabad in India, and London's Moorfields Eye Hospital and the UCL Institute of Ophthalmology. Earlier research using solid implants made from recombinant human collagen were successfully tested in patients at the Tej Kohli Cornea Institute in Hyderabad and in Odessa, Ukraine. However, these implants were too expensive to produce and required a full operating theatre.

By contrast the biosynthetic 'glue filler' could be administered from a syringe by an ophthalmologist in a 30-minute procedure without an operating theatre. Moreover, the reliance on the regeneration of the patients' own corneal tissue means that rejection will be low compared to grafting, removing the long term need for expensive immunosuppressant drugs. Laboratory studies on 100% thickness corneal wounds have already shown great promise for the biosynthetic, with pre-clinical studies now underway.

Dr Bruce Allan, Consultant Eye Surgeon at Moorfields Eye Hospital said,"Blindness as a consequence of corneal perforation is common, particularly in developing countries where there is often no access to corneal transplantation. Novel glue fillers that have the potential to seal the cornea and promote natural tissue regeneration do not require expensive infrastructure and can be used anywhere. We are very excited to be working with the Tej Kohli Foundation on this."

Wendy Kohli, co-Founder of the Tej Kohli Foundation said, "Our mission is to eliminate needless corneal blindness by 2035. Whilst the thousands of corneal transplant surgeries that the Foundation funds each year transforms many lives, it is statistically impossible to eliminate corneal blindness in this way. That's why for a number of years we have also been quietly funding our Applied Research program to develop an affordable, scalable and accessible treatment for corneal blindness that is suitable for the poor and underserved communities where corneal blindness is most pervasive. It is very exciting that our proprietary solution is now ready to enter into clinical trials."