Corneas bioengineered from pig collagen can restore sight

August 17, 2022

In news— For the first time, researchers in Sweden have been able to create a successful alternative bioengineered cornea implant made of collagen derived from pig skin.

Key findings-

- Under the study, a bioengineered cornea implant was used to successfully restore the vision of 20 people in India and Iran, most of whom were blind due to keratoconus, a disease that leads to thinning of the cornea.
- Researchers claim that there is a severe shortage of corneas, with only one available for 70 patients.
- As a substitute for human corneas, the researchers utilised medical-grade collagen derived from pig skin, a byproduct of the food industry that is already used in medical devices for glaucoma surgery.
- This is not only cheaper and easier to access than donated corneas, but requires a less invasive procedure and can be stored for a significantly longer period up to two years.
- The researchers developed a minimally invasive method without the use of stitches, where a small incision is made in the patient’s eye, and the implant is inserted over the existing cornea.
- This can be done with high-precision lasers or by using readily available surgical instruments.
- This new method was used by surgeons in India and Iran, where there is a lack of donated corneas.
- Not only was the procedure safe for all 20 participants, the researchers found that 2 years after the operation,
The results show that it is possible to develop a biomaterial that meets all the criteria for being used as human implants, which can be mass-produced and stored up to two years and thereby reach even more people with vision problems.

**What is Cornea?**

- The cornea is a transparent avascular tissue that acts as a structural barrier and protects the eye against infections.
- Along with the tear film, it provides a proper anterior refractive surface for the eye. It contributes to two-third of the refractive power of the eye.
- Damage to the cornea, the clear, outermost layer of the eye is one of the leading causes of blindness across the world, leaving approximately 12.7 million people blind, and particularly affecting those in poorer countries where there is a scarcity of donated human corneas.

**Note:**

- Keratoconus occurs when the cornea, the clear, dome-shaped front surface human eye thins and gradually bulges outward into a cone shape.
- A cone-shaped cornea causes blurred vision and may cause sensitivity to light and glare.
- Keratoconus usually affects both eyes, though it often affects one eye more than the other.
- It generally begins to affect people between the ages of 10 and 25. The condition may progress slowly for 10 years or longer.