A New Contact Lens to Prevent and Treat Infections of the Cornea

A hydrogel contact lens, which possesses inherent antimicrobial properties

Reference: Cornea Infection Contact Lens

About University of Liverpool

By facilitating access to our expertise, facilities and networks, the University of Liverpool offers the means to transform ideas into creative solutions, improved performance, new technologies, strategies, applications, products or skills.
Background

Corneal infection is one of the most common conditions of the cornea and accounts for 5% of cases of blindness worldwide. After corneal surgery, antibiotics are applied as a preventative measure to reduce the risk of infection. This can require the application of antibiotics every 4 hours, every day, until the cornea heals. If a corneal infection occurs, antibiotics are applied more frequently, such as, every 15 minutes for the first 48 hours, then 2-6 hourly until the infection is treated. This is difficult for patients to do and can lead to a lack of compliance.

There is an opportunity to address these issues through a bandage contact lens with antimicrobial properties that is soft and comfortable for the patient to wear after surgery or that could incorporate antibiotics that are released in a sustained and controlled manner to treat an infection in a more effective way than eye drops.

Tech Overview

A multidisciplinary team at the University of Liverpool have developed a hydrogel contact lens, which possesses inherent antimicrobial properties. This allows the lens to act as a prophylactic device reducing the risk of infections of the eye after surgery.

In addition, antibiotics can be incorporated into the lens and be released in a sustained manner whilst on the eye.

Stage of development

The team have:

- synthesised and characterised the contact lenses (including mechanical properties, water content, oxygen permeability and transparency)
- tested the antimicrobial properties of the lens against bacteria that commonly infect the eye
- initiated the incorporation of antibiotics into the material of the lens and evaluation of the release and antimicrobial activity over time

The team is currently preparing the documentation for biocompatibility testing in animals to support an application for a Phase 1 clinical trial planned to commence in July 2020.

Benefits

The lenses developed here:

- replace the need for frequent application of antibiotic eye drops to prevent infection after surgery
- could be used on both the human and animal (farm animals/pets) eyes
• could be used to treat corneal infections by incorporating antibiotics
• have the potential to be developed as daily disposable contact lenses with reduced risk of causing corneal infection