

Study supports safety of antimicrobial peptide-coated contact lenses

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Contact lenses coated with an antimicrobial peptide could help to lower the risk of contact lens-related infections, reports a study in *Optometry and Vision Science*, official journal of the American Academy of Optometry.

Studies in animals and now humans support the biocompatibility and safety of lenses coated with the antimicrobial peptide melimine, according to the new research by Debarun Dutta, B.Optom, of The University of New South Wales, Sydney, and colleagues. They write, "[T]his study has shown that melimine coated [contact lenses](#) can be safely worn by humans without any major side effects."

Synthetic Coating Designed to Mimic Natural Infection-Fighting Peptides

The researchers performed a series of experiments to evaluate the safety of contact lenses coated with melimine, designed to reduce the risk of inflammation and infections. Melimine is not an antibiotic—rather, it is a "cationic peptide" with broad-spectrum antimicrobial activity.

"Antimicrobial peptides are small peptides and part of the innate immune system of all multicellular organisms with the native ability to inhibit microbial growth," Dr Dutta and colleagues explain. Melimine is among the first [antimicrobial peptides](#) to be tested for clinical use. The study used conventional disposable contact lenses to which melimine was

molecularly (covalently) bonded.

Studies in rabbits supported the safety of melimine-coated contact lenses for up to three weeks. There were no signs of toxic effects on the eye, either in terms of inflammation/infection or on the cellular level.

In a subsequent study, human volunteers wore melimine-coated or conventional contact lenses for one day. The coated and uncoated lenses had similar characteristics, including wettability, surface deposits, lens fitting on the center of the eye, lens movement and tightness, and coverage of the cornea. Importantly, there were no differences in redness of the eye—an early sign of irritation or inflammation.

No Signs of Safety Problems with Melimine-Coated Lenses in Human Eye

The only significant difference was increased staining of the cornea (the clear outer layer of the eye) caused by melimine-coated lenses. Comfort ratings were similar between the two lenses—just one volunteer reported discomfort with the coated lenses.

No delayed reactions occurred after wearing melimine-coated lenses. The day after they were worn, the lenses were still active against *Pseudomonas* and *Staphylococcus* bacteria in culture.

Wearing contaminated contact lenses can cause redness and inflammation of the eye, leading to rare but potentially serious infections. "A contact lens with high antimicrobial activity may inhibit microbial adhesion and consequently reduce these...adverse events," Dr Dutta and coauthors write. Preliminary studies in animals have supported further research and development of contact lenses coated with melimine.

The new results add to previous data on the safety of melimine-coated lenses in animals, and provide initial evidence of their safety and comfort in humans. The lenses also show lasting [antimicrobial activity](#). Dr Dutta and colleagues add, "Whether melimine could reduce contact lens-related adverse events during wear, especially extended wear, requires more clinical trials."

"Practitioners and researchers are hoping to develop new ways to try to reduce rare corneal infections associated with contact lens wear," comments Anthony Adams, OD, PhD, Editor-in-Chief of *Optometry and Vision Science*. He notes that the melimine-coated contact lenses show broad-spectrum antimicrobial properties, and appear safe and effective against *Pseudomonas* and *Staphylococcus* bacteria—some of the major "bad actors" causing corneal infections. Dr Adams adds, "While the study is one of the earlier demonstrations, it does appear to be promising."

Provided by Wolters Kluwer Health

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