Certain laboratory technique allows rapid detection of eye pathogens

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A laboratory technique using real-time polymerase chain reaction (PCR) that copies DNA segments may allow clinicians to accurately identify pathogens infecting the cornea more quickly than standard methods, according to a report in the May issue of *Archives of Ophthalmology*.

"Corneal ulcer, including bacterial keratitis, fungal keratitis and Acanthamoeba keratitis, can cause corneal opacity, deteriorated visual acuity or even lead to some lifelong complications," the authors write as background information in the article. "Bacterial culture and smear examination using corneal scrapings is the conventional method to detect causative pathogens of corneal ulcer. However, bacterial culture is time-consuming and results of smear examination depend on the laboratory technician's skill. Therefore, a fast and accurate diagnostic method is highly desirable."

In recent years, PCR has become more widely used clinically for the detection of bacteria and viruses; it amplifies a small segment of DNA for assessment. Motoki Itahashi, M.D., Ph.D., and colleagues at Kinki University School of Medicine, Osaka-Sayama, Japan, compared real-time PCR using corneal scrapings to bacterial culture for the detection of six common bacteria and fungi in 40 eyes of 40 patients diagnosed with corneal ulcer.

The real-time PCR assay delivered results within two hours, whereas culture results were examined after 48 hours. Of the 40 eyes, 20 had the same pathogens detected by both methods and six showed negative

results by both methods. Results differed in 14 eyes: 11 eyes had positive results for one of the six pathogens only on PCR, two had positive results on culture only and one eye had positive results for two different pathogens.

"Although PCR has a high risk of false positivity, we actually treated the patients with positive PCR results only according to their real-time PCR results and the treatment outcomes were all satisfactory," the authors write. "This may demonstrate a better detection sensitivity in the PCR assay."

"In conclusion, though the numbers included in this study were limited, particularly with fungal ulcers, we have demonstrated that real-time PCR can accurately and simultaneously detect bacterial and fungal pathogens in a speedy fashion," the authors write. "With real-time PCR, it may be possible to develop a diagnostic kit for pathogen-specific detection in the busy ophthalmic clinical practice."

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