

Multiple species of bacteria may cause trachoma: Implications for treatment

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In a study published in this week's PLoS Medicine, researchers have found that more than one species of bacteria may be causing the infectious eye disease trachoma. Six million people – most of whom live in crowded and unhygienic conditions in the developing world – are blind because of the disease and many more are actively infected. The possibility that multiple strains of the Chlamydiaceae family of bacteria are involved in trachoma would involve a re-evaluation of vaccines and treatment programmes.

It is accepted that *Chlamydia trachomatis* (*C. trachomatis*) causes trachoma. The bacteria, some strains of which are associated with sexually transmitted infections, can also pass between people on hands and clothing; successive infections cause scarring of the inside of the eyelid. As the eyelashes of the infected eyes turn inward they scar the cornea - the transparent tissue covering the front of the eye - leading eventually to blindness. To investigate whether other species of Chlamydiaceae also cause human trachoma, Deborah Dean and colleagues from Children's Hospital Oakland Research Institute and the University of California San Francisco conducted their research in the Lumbini Zone of south-western Nepal where the disease is endemic. Obtaining specimens from 146 individuals in 9 households, they found that a third of the people who had trachoma were infected with only *C. trachomatis*, including not only the type that is typically described in trachoma-infected eyes but also the type usually associated with sexually transmitted diseases. Also, participants with Chlamydiaceae infections of the eye were infected only with species previously associated with lung infections: one in five showed *Chlamydia psittaci* (*C. psittaci*) and one in ten *Chlamydia pneumoniae* (*C. pneumoniae*); infection with these strains was just as strongly linked with severe inflammation of the eyes as was infection with the *C. trachomatis* bacteria already known to cause trachoma. Additionally, one third of the individuals

had a mixed infection with two or three species.

Interventions to prevent trachoma by improving personal hygiene – such as the SAFE initiative promoted by the World Health Organization – have had limited success, and an effective vaccine may also be needed to eliminate the disease. The findings and their distribution by household and age provide evidence that *C. psittaci* and *C. pneumoniae*, in addition to *C. trachomatis*, are involved with trachoma and that these infections are widespread rather than sporadic. The findings would also explain why some people with active trachoma do not have *C. trachomatis* in their eyes, and suggest that antibiotics used for trachoma may need to be changed or used for longer periods of time to be effective against all three species. If these findings are confirmed in other trachoma-endemic regions, then future vaccines and treatments will need to combat all these bacteria and not just *C. trachomatis*.

Source: Public Library of Science

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