

MONITORING ANTIBIOTIC RESISTANCE WITH THE ARMOR STUDY

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Antibiotic resistance is a topic of significant and increasing concern in the health care community and one that authorities in the United States and around the world are actively monitoring. In ophthalmology, continuous surveillance of this trend is particularly important because we often treat infection before the pathogen has been identified and because, many times, the pathogen is never identified.

Initiated in 2009, Bausch + Lomb's Antibiotic Resistance Monitoring in Ocular Microorganisms (ARMOR) surveillance study is the only multicenter, national survey of antibiotic resistance patterns among bacteria specific to eye care. This ongoing surveillance study, now in its sixth consecutive year, is designed to provide health care professionals with information about evolving trends in antimicrobial susceptibility patterns to help guide treatment decisions.¹

At this year's Association for Research in Vision and Ophthalmology meeting, my colleagues and I reported year-over-year comparisons of susceptibility rates based on 2013 data on 496 bacterial isolates collected from 22 participating sites and preliminary 2014 data on 141 isolates collected from seven participating sites. The survey included the organisms most frequently implicated in bacterial eye infections, including *Streptococcus pneumoniae*, *Staphylococcus aureus*, coagulase-negative staphylococci (CoNS), *Pseudomonas aeruginosa*, and *Haemophilus influenzae*.

RESULTS

Similar to previous years, we observed high levels of antibiotic resistance (full and intermediate resistance). Preliminary data indicate that approximately one in two *S pneumoniae* isolates was resistant to penicillin and that two in five were resistant to azithromycin. During this period, tobramycin resistance among CoNS appeared to increase, whereas resistance rates for azithromycin remained stable.

H influenzae isolates were susceptible to all antibiotics

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tested, with the exception of a fluoroquinolone-resistant isolate and an azithromycin-resistant isolate. Methicillin resistance among staphylococci remained high, with one in four *S aureus* and one in two CoNS (ie, *S epidermidis*) isolates resistant. Many methicillin-resistant staphylococci were multidrug resistant, a finding that has remained relatively consistent over the 6-year data collection history of the ARMOR study.

All of these findings will be reviewed upon evaluation of the full-year data set.

CLINICAL IMPLICATIONS

Antibiotic resistance among common ocular pathogens is a significant problem. Knowing that resistance among *S aureus* and CoNS can be associated with multidrug resistance is important information for all clinicians, as is an understanding of trends.

While it is important to consider the ARMOR data when making treatment decisions, clinicians must consider each case individually. The effect of treatment often depends upon a combination of factors, including the pathogen, the choice of antibiotic, and, importantly, the patient (or host). Following are some best practices that can help clinicians manage this issue and improve patient care.

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AT A GLANCE

- Bausch + Lomb initiated the ARMOR surveillance study in 2009. It is the only national survey of antibiotic resistance patterns among ocular-specific bacteria.
- The survey included the organisms most frequently implicated in bacterial eye infections, including *Streptococcus pneumoniae*, *Staphylococcus aureus*, coagulase-negative staphylococci, *Pseudomonas aeruginosa*, and *Haemophilus influenzae*.
- Antibiotic resistance among common ocular pathogens is a significant problem.

- Pay close attention to infection control protocols. Doing so can help decrease the risk of nosocomial infections.
- Consult local antibiograms. The hospital antibiogram is a periodic summary of antimicrobial susceptibilities of local bacterial isolates submitted to the hospital's clinical microbiology laboratory.² These tools can be used to assess local susceptibility rates, aid antibiotic therapy selection, and monitor resistance trends over time within an institution.
- Avoid overprescribing. Antibiotics will not aid in the resolution of a viral infection, for example.
- Consider class switching. Rotate the class of antibiotics your practice uses. Combination treatment may also be considered.
- Engage in posttreatment monitoring. Tracking the patient's response to treatment allows the clinician to evaluate the need for a change if improvement is not sufficient. ■

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1. Asbell PA, Sanfilippo CM, Sahn DF, Decory HH. Antibiotic resistance among ocular pathogens — results from the ARMOR surveillance study 2013-present. Poster presented at: The Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO); May 6, 2015; Denver, CO.

2. Joshi S. Hospital antibiogram: a necessity. *Indian J Med Microbiol.* 2010;28(4):277-280.

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