Multidrug-resistant bacteria from chickens pose risk to human health

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Isolates of a common poultry pathogen collected from animals in Indian bird markets were mostly resistant to multiple classes of antibiotics. The study provides the first data on prevalence and isolation of *Helicobacter pullorum* in India. The research is published November 4 in *Applied and Environmental Microbiology*, a journal of the American Society for Microbiology.

In the study, the investigators sequenced the genomes of 11 isolates of the pathogen, *H. pullorum*, from broiler and free range chickens from markets in Hyderabad, India. Each contained five or six well characterized antimicrobial resistance genes. The isolates were resistant to fluoroquinolones, cephalosporins, sulfonamides, and macrolide antibiotics, as well as others. Additionally, they produced extended spectrum ?-lactamases, enzymes that rendered them resistant to penicillin family antibiotics.

Virulence screening identified 182 important virulence genes in the isolates.

Coauthor Niyaz Ahmed, PhD, Professor of Biotechnology & Bioinformatics, University of Hyderabad, India, said that *H. pullorum* could potentially be pathogenic in poultry and in humans, and explained that cases have been reported of human enteric disease caused by this bacterium. He also said that it carries a toxin that can interfere with the cell cycle, and cause DNA damage that can lead to cancer.

H. pullorum could become a public health concern, said Ahmed, because of the cancer-causing potential, and because "in countries like India, *H. pullorum* from poultry could be multi-resistant already because of the prevailing animal husbandry practices."

The lack of research on the prevalence of *H. pullorum* in India provided the impetus for the study, said Ahmed. "We targeted wet market poultry outlets for our sampling, keeping in mind that poultry in India are often fed with antibiotics to promote weight gain. These practices most likely boost spread of drug-resistant pathogens among animals and humans, posing a significant public health risk."

"Our study suggests that chickens could be a major source for transmission of emerging MDR pathogen, *H. pullorum*, from poultry to humans," the investigators concluded. Additionally, they wrote, the study strongly supports the hypothesis that this species is an emerging pathogen, as it is closely related to established pathogens such as *Campylobacter jejuni*. Given the prevalence of *H. pullorum* in Indian chicken, as described in the study, the half billion Indians who eat chicken, and the fact that chicken consumption is growing at a huge 12 percent per year, the potential for spreading multi-drug resistance is "alarming," the researchers wrote.

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