Prospective Outbreak Detection in Pets as a Sentinel Indicator for Outbreaks in Humans

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Objective

This paper describes occurrences of possible co-morbidity in pets and humans discovered in a retrospective study of veterinary microbiology records and through the application of syndromic surveillance methods in a prospective outbreak detection system using veterinary laboratory orders.

Background

Sixty-one percent of known disease-causing agents that infect humans can also infect animals [1]. While humans are the primary reservoir for only 3% of zoonoses, detection of zoonotic disease outbreaks remains mostly dependant on the identification of human cases [2]. Very few of the diseases that are a threat to humans are reportable in pets. Over one-third of American households include at least one pet [3]. Pets can present with clinical signs of disease earlier than people after becoming infected at the same time [4]. Pets can also become infected first and act as a source of infection for humans [5]. Detection of an outbreak in pets may then provide for warning of an outbreak that could affect humans.

Methods

The author investigated veterinary laboratory orders as a potential data source that would provide a means to monitor disease activity in pet populations and provide for earlier discovery of zoonotic disease outbreaks.

Investigation of veterinary laboratory orders submitted to IDEXX Laboratories (Westbrook, Maine) from veterinary clinics in Ohio included a retrospective study of records from 2003 and a prospective study conducted in autumn 2006. Case study methods are used to describe three occurrences of increased incidence of zoonotic disease that occur in temporal relation between pet animals and humans discovered during these investigations.

Results

Retrospective examination revealed a period of increased hemolytic *E. coli* isolates in pets. During the same period, reports of *E. coli* O157:H7 in humans were also increased. Less than half of the cases were associated with food. Among those human reports not associated with food, 8 isolates were indistinguishable by PFGE.

During the prospective study, there were 2 occurrences where significantly elevated counts of orders were associated with verified disease activity in animals. One of these occurrences, involving an unidentified gastrointestinal illness (GI), was accompanied by marked increases in emergency room visits of people with GI-associated chief complaints and over-the-counter sales of anti-diarrheal medications. The second occurrence, also involving a gastrointestinal illness, was accompanied by increases of GI illness in humans that were reported to public health 21 days after analysis in the prospective system alerted to increased counts of GI-related veterinary laboratory orders

Conclusions

Increases in disease occurrence affecting humans may also appear in data for pets. While veterinary laboratory data may be biased toward clinically ill animals, surveillance using these data may provide for improved awareness of zoonotic disease prevalence and incidence other than occurrences of human cases. Prospective analysis of veterinary laboratory order counts may provide another means of detecting outbreaks that could affect humans improving our overall early detection efforts and capabilities.

References

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