Characterization of bacterial and viral causes of severe and respiratory disease in smallholder chicken farms in The Mekong Delta of Vietnam

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Background

- Small-household chicken farming systems are common in the Mekong Delta region of Vietnam
- Levels of morbidity and mortality due to infectious diseases are high due to poor biosecurity and husbandry practices
- In an attempt to limit the losses, farmers typically resort to the use of antimicrobials and vaccines without basis
- There is a lack of knowledge as to what infectious causative agents are present in the area

Aims

- To investigate the main causes of respiratory and septicaemic disease among smallholder (<2,000) chickens farms in the Mekong Delta of Vietnam
- To evaluate the prevalence of antimicrobial of resistant from isolated pathogens

Methods

- Veterinarian officers were informed by veterinary pharmacists farm seeking therapy advice
- Farms with chickens experiencing either high mortality or signs of severe respiratory disease were eligible
- Post-mortem examination of two chickens
- Systemic collection of tissue for diagnostic
- Screening of 10 pathogens by culture and PCR methods
- Isolated bacteria were identified by MALDi-TOF
- Disk diffusion sensitivity tests for ORT
- Breakpoints of sensitivity test followed CLSI instruction

Results

- 45 farms were investigated (median farm size 150 chickens [IQR 90-300]; median age 7 weeks IQR). Cumulative mortality over previous 2 weeks 3.8% [IQR 1.5-13.3%]
- 32 farms (71%) used antimicrobials
- 12 antimicrobials were used: ampicillin, amoxicillin, colistin, lincomycin, gentamicin, neomycin, doxycycline, enrofloxacin, erythromycin, florfenicol, tetracycline
- 8/10 pathogens detected by both methods.

Prevalence of resistance in ORT isolates

- 10 ORT isolates tested
- Detectable bacteria versus antimicrobial usage
- Bacterial pathogens were detected from 24/32 (75%) farms that used antimicrobials and 9/13 (69%) farms that not used antimicrobials over previous 2 months (p=0.875)

Discussion and further work

- High prevalence of detection of ND (95%), AVI (68%) on farms
- 2/3 of farms have chicken infected with multiple pathogens
- High proportion of ORT isolates non-susceptible to erythromycin, amoxicillin, tetracycline and doxycycline
- Further study to compare vaccine and field strains of ND using molecular method
- Further investigate antimicrobial resistance bacteria (AVI, PM, APEC, ORT)
- Evaluate relationship between antimicrobial usage and isolated bacteria

References


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