Broiler chickens, broiler chicken meat, pigs and pork as sources of ExPEC related virulence genes and resistance in Escherichia coli isolates from community-dwelling humans and UTI patients. - DTU Orbit (05/12/2018)

Broiler chickens, broiler chicken meat, pigs and pork as sources of ExPEC related virulence genes and resistance in Escherichia coli isolates from community-dwelling humans and UTI patients.

Urinary tract infection (UTI) is one of the most common bacterial infections. UTI is primarily caused by extraintestinal pathogenic Escherichia coli (ExPEC) from the patients' own fecal flora. The ExPEC often belong to phylogroups B2 and D, the groups which include potent human ExPEC isolates causing UTI, bacteremia, and meningitis. The external sources of these ExPEC in the human intestine are unknown. The food supply may transmit ExPEC to humans. However, evidence of this hypothesis is limited. To assess this hypothesis, the objective of our study was to investigate the presence of ExPEC related virulence genes in E. coli isolates from UTI patients, community-dwelling humans, meat, and production animals. Accordingly, we included 964 geographically and temporally matched E. coli isolates from UTI patients (n=102), community-dwelling humans (n=109), fresh Danish (n=197) and imported broiler chicken meat (n=86), broiler chickens (n=138), fresh Danish (n=177) and imported pork (n=10), and pigs (n=145) in the study. All isolates were investigated for the presence of eight ExPEC related genes (kpsM II, papA, papC, iutA, sfaS, focG, afa, hlyD) using PCR. To investigate any similarities between isolates from the different origins, we performed a cluster analysis including antimicrobial resistance data previously published. We detected seven of the eight ExPEC related genes in isolates from broiler chicken meat, broiler chickens, pork and pigs. Our findings suggest that broiler chicken meat, broiler chickens, pork and pigs could be the source of strains with these ExPEC related virulence genes in community-dwelling humans and UTI patients. Especially detection of ExPEC related virulence genes in isolates belonging to phylogroups B2 and D is very concerning and may have a significant medical impact. The cluster analysis of virulence gene and antimicrobial resistance profiles showed strong similarities between UTI patient, community-dwelling human isolates, meat, and production animal isolates. Thus, these strains from meat and production animals may pose a zoonotic risk.

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