TITLE: TRACKING OF THE CONTAMINATION BY YERSINIA ENTEROTO COLITICA IN THE PORK PRODUCTION CHAIN


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ABSTRACT:
Pork is the main animal origin protein consumed around the world. Yersinia enterocolitica is a relevant foodborne pathogen in pork products, once pigs are reservoirs of this pathogen. Y. enterocolitica is responsible for human yersiniosis, a gastroenteritis that causes acute diarrhea and fever (especially in children), abdominal pain, acute mesenteric lymphadenitis, mimicking appendicitis. This study aimed to track the contamination sources of Y. enterocolitica in a pork production chain, and to characterize the pathogenic potential and antimicrobial resistance profiles of isolates. Samples from different steps of pork production (environment, carcasses, palatine tonsils, mesenteric lymph nodes, utensils, equipment, and end products; n = 870) were obtained from two finishing pig farms and one slaughterhouse located in Minas Gerais, Brazil. Samples were subjected to Y. enterocolitica detection, and the obtained isolates were subjected to phenotypical and molecular analysis for identification and serotyping. Y. enterocolitica isolates were subjected to XbaI macrorestriction and pulsed filed gel electrophoresis (PFGE), PCR to detect virulence related genes, and to breakpoint and PCR to characterize their antimicrobial resistance profiles against 17 antibiotics. Y. enterocolitica was isolated in 8 samples, specifically palatine tonsils (5), mesenteric lymph nodes (2) and carcasses after bleeding (1), and 16 isolates were obtained. All isolates were identified as belonging to bio-serotype 4/O:3, associated to various yersiniosis cases and outbreaks around the world. PFGE demonstrated 60 to 80% identify indexes among isolates, and allowed the identification of palatine tonsils as relevant contamination sources in the pork production chain. The isolates presented different virulence related genes, demonstrating the pathogenic potential of Y. enterocolitica. All isolates presented high frequencies of antimicrobial resistance, despite the presence of emrD, yfhD and marC, related to multi-drug resistance. Only ciprofloxacin and kanamicin were effective against all isolates. The present study demonstrated the relevance of pigs in the distribution of Y. enterocolitica in the pork production chain, highlighting the need for proper control of contamination and tracking of this foodborne pathogen in the initial steps of production, what must be conducted with the support for available tools to assure the quality and safety of pork products.

Keywords: Yersinia enterocolitica, tracking, virulence, PFGE, antimicrobials

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