

TITLE: MOLECULAR AND PATHOLOGICAL CHARACTERIZATION OF ENDOMETRIAL PATHOGENIC *E. coli*

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ABSTRACT:

The etiological agent normally related with pyometra is an extra-intestinal *Escherichia coli* called EnPEC (Endometrial Pathogenic *E. coli*); Therefore, the aim of this study is characterize the microscopic lesions and bacteria involved in cases of pyometra in domestic animals, and also characterize the virulence profile and capacity of lesion in endometrial epithelium of *E. coli* isolates. Thirty samples of intrauterine contents and uterus of females (dogs and cats) diagnosed with pyometra and eight healthy animals submitted to castration (control group) were subjected to microbiological culture, and tissue histopathology analysis by hematoxylin-eosin stain and immunohistochemistry (IHC) assay with anti-*E. coli*. According to the magnitude of uterus lesions three pathological classifications were proposed: 1) mild lesions; 2) moderate lesions; and 3) severe lesions. To characterize the virulence profile of the EnPEC strains, the DNA was extracted from the isolates by boiling method and seven gene markers were analyzed by PCR (*cnf1*, *cdtA*, *hlyE*, *papC*, *irp1*, *fimA*, and *iss*). Among the 30 isolates from clinical cases, there was a higher occurrence of *E. coli* (15/30), followed by the genera *Streptococcus* spp. (4/30), *Enterococcus* spp. (4/30), *Staphylococcus* spp. (3/30), *Bacillus* sp. (1/30), *Pseudomonas aeruginosa* (1/30), *Citrobacter* sp. (1/30) and culture negative (4/30); while the animals from the control group have not presented bacterial isolation or pathological lesions. The most common histopathology profile was the severe lesions (56.6% of cases), being *E. coli* involve in main of them (70.6%). Moderate and mild lesions correspond to 30% and 13.3%, respectively. The IHC staining showed the *E. coli* pathogenicity profile highlight adherence to endometrial epithelium, tissue destruction, and host cell invasion. In relationship to the virulence profile, genes to toxins *cnf1*, *cdtA* and *hlyE* were present in 60%, 53.3% and 100% of the strains, respectively; genes to adherence were present in 100% (*papC*) and 93.3% (*fimA*) of EnPEC strains, while iron uptake system (*irp1*) was identified in 86.7%. Serum resistance (encoded by *iss* gene), which is important to the invasion success was present in 86.7% of our isolates. In summary, we have described the virulence and pathological profile of the pathotype EnPEC from domestic animals, showing the high lesion levels and invasiveness ability of this *E. coli* pathotype.

Keywords: Pyometra, *Escherichia coli*, pathology, virulence profile.

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