Colonization of chicken lung by avian pathogenic strains of *Escherichia coli* is accompanied by apoptosis

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Avian pathogenic *Escherichia coli* (APEC) belong to the extraintestinal pathogenic group of *E. coli*. After inhalation of contaminated dust, APEC enter and colonize the respiratory tract of chickens, in some cases spreading to internal organs and resulting in a fatal coliseptisemia. We have previously observed that some APEC strains cause apoptosis in infected HD11 chicken macrophages. Here we analyzed if infection with APEC cause apoptosis *in vivo*. Five-week-old chickens were infected intratracheally with 10^9 CFU of strains APEC17 (Ont:H5), MT78 (O2:K1:H^+), IMT5155 (O2:K1:H5) or IMT5104 (O8:H^-, non-pathogenic), or mock-infected with PBS. Twelve, 18 and 24 hours later, the animals were killed and lungs dissected, fixed and paraffin-embedded. Histological sections were then labelled with TUNEL, which recognizes apoptotic cells. Lungs of mock-infected chickens showed virtually no positive cells at any time; in contrast, lungs from chickens infected with APEC17, MT78, IMT5155 or IMT5104 all had many TUNEL-positive cells at 12 h post-infection, the number decreasing at 18 and 24 hours. All 4 strains colonize the lungs, but only strains MT78 and IMT5155 cause systemic infection. Thus, our results suggest that the colonization of the chicken lung by an avian strain is accompanied by apoptosis regardless of its ability to cause systemic infection.

Financial support: CAPES