

TITLE: POTENTIAL RISK OF VIABLE NON-CULTIVABLE FORMS OF *Campylobacter jejuni*

AUTHORS: DUMONT, C.F.; SANTOS, L.S.; BRAZ, R.F.; SILVA, C.B.; SANTOS, F.A.L.; MENDONÇA, E.P.; MONTEIRO, G.P.; FONSECA, B.B.; ROSSI, D.A.; MELO, R.T.

INSTITUTION: UNIVERSIDADE FEDERAL DE UBERLÂNDIA – FACULDADE DE MEDICINA VETERINÁRIA, UBERLÂNDIA, MG (AVENIDA PARÁ, 1720, CEP 38400-902, UBERLÂNDIA – MG, BRAZIL)

ABSTRACT:

Campylobacter jejuni is one of the main causes of foodborne gastroenteritis worldwide, with chicken meat being the main form of human infection. This agent is able to survive in adverse conditions through the formation of biofilms, and extreme stress, also promotes the acquisition of a viable non-cultivable state (VNC). Considering its emergence and the recent international requirements of its control in food, the aim was to determine in 27 strains of *C. jejuni*, of poultry origin and phylogenetically distinct, the time necessary for the formation of VNC cells and to determine if in this form they still present invasive and adaptive potentials. The determination of VNC form was performed with planktonic strains starting from a mean initial count of 7.8 log CFU/mL kept under nutritional, oxidative and thermal stress with constant monitoring of the typical morphology and viability analysis in medium (CCDA) for up to 60 days. After the acquisition of VNC form, they were submitted to gene transcription by RT-PCR for *ciaB* (virulence) and *p19* (adaptation) genes. The acquisition of VNC form was obtained on days 12, 20, 24, 32 and 56 of stress. The mean time spent by *C. jejuni* to acquire the VNC form was 26 days, and (16/27 - 59.3%) took between 20 and 24 days. During the transition, which corresponded to an average of the last eight days, it was possible to observe coccoid and spiral morphologies in the same smear. In the transcriptional analysis *ciaB* gene was detected in (16/27-59,3%), and the majority of them (13/16-81,2%) acquired the VNC state in a smaller range of time (between 12 and 20 days). Transcription of *ciaB* gene confers a higher invasiveness capacity in the pathogenesis of the disease in humans. Transcription of *p19* gene was present in all strains in the VNC form (100%). The difference found for both genes indicates that extreme stress induces the decrease of the virulence gene expression in order to prioritize the transcription of genes linked to adaptive processes. The identification of VNC form in all strains represents a danger to public health, due to the non detection of the pathogen in traditional methodology. The time variation shows that the transition to the VNC state is strain-dependent. The presence of transcripts for *ciaB* and *p19* alerted that *C. jejuni* even in VNC form remains potentially virulent and mainly adapted to stress, which makes evident the potential danger of this latent form.

Keywords: transcriptional analysis, *ciaB*, planktonic form, *p19*

Development Agency: Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG)