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Characterizing The Lethal Dose And Disease Progression Of Bacillus Cereus Biovar Anthracis Cameroon And Cote D'ivoire Following Aerosol Administration In The New Zealand White Rabbit Model.

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Bacillus anthracis is a zoonotic organism that causes the disease anthrax. Inhalation of *B. anthracis* spore results in the pneumonic form of disease that progresses quickly and is often fatal without early medical intervention. Recently, reports have identified *Bacillus cereus* isolates that possess the *B. anthracis* virulence factors coded on pXO1- and pXO2-like plasmids and cause an anthrax-like disease in non-human primates. To understand the differences and similarities between *B. anthracis* and *B. cereus* biovar anthracis (Bcbva), the inhalational median lethal dose (INHLD50) in a New Zealand white (NZW) rabbit model was determined for two isolates - Bcbva Cameroon (CA) and Bcbva Cote d'Ivoire (CI). This model assessed disease progression following aerosol challenge by quantifying temperature responses, bacteremia, and bacterial virulence factor production in both survivor and non-survivor animals. The rabbit INHLD50s for Bcbva CA and CI were not statistically different than the published values for the fully virulent *B. anthracis* strain, Ames 2084. Additionally, the mean times to significant increase in body temperature (SIBT) and death were dose dependent for both Bcbva isolates as is observed in *B. anthracis* Ames 2084. All animals that succumbed to inhalation agent administration displayed SIBT prior to death. Differences were observed in virulence factor production (protective antigen and hyaluronic acid) over time within serial rabbit serum samples prior to rabbit mortality. Collectively, these data suggest that the anthrax-like disease caused by Bcbva is like the disease cause by virulent *B. anthracis*, and that the inhalation NZW rabbit model is useful for studying infection by Bcbva strains.

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