

4th World Congress and Expo on

Applied Microbiology

September 19-21, 2016 Las Vegas, USA

Surviving the acid barrier: Responses of pathogenic *Vibrio cholerae* O1 and O139 to simulated gastric fluid (SGF)

Atheesha Singh and Tobias Barnard
University of Johannesburg, South Africa

When bacteria are subjected to acidic pH of the gastric environment they may enter the viable but non culturable (VBNC) state of survival. In this state, bacteria cannot be cultured on solid media and still exhibit signs of metabolic activity. The response of pathogenic *Vibrio cholerae* O1 and O139 to low pH simulated environments of the human stomach was evaluated for their survival by culturability (plate count) and viability (flow cytometry-FC) assays. Bacteria were acid challenged with simulated gastric fluid (SGF) at varying acidic pH over 180 minutes. We established that exposure to the acidic SGF for a limited period of time increased acid tolerance of the pathogenic *Vibrio* up to pH 3.5 with acid challenge occurring at pH 4.5. Bacteria were culturable from pH 2.5-4.5 up to 60 min SGF exposure. Stationary phase *Vibrio* cultures survived SGF at all pH in an 'injured' state with FC. This could mean that the bacteria have entered the VBNC stage of survival. The minimal number of ingested *Vibrio* pathogens necessary to inflict disease still remains a controversial issue and in this study we established that low numbers of *Vibrio* were able to survive the acidic conditions of SGF without pre-adaptation. This study foresees the potential increase of waterborne diseases in immune-compromised individuals that depend on the gastric fluid barrier as protection against bacterial pathogens. This is a worrying public health concern due to the fact that once favorable conditions arise (intestines) these *Vibrio* can change back to an infectious state and cause disease.

Biography

Atheesha Singh has completed her PhD from the University of KwaZulu-Natal and currently pursuing Postdoctoral studies at the University of Johannesburg, South Africa. She has published and presented several papers in reputed journals and international conferences.

asingh@uj.ac.za

Notes: