The role of oxygen in antibiotic resistance in Listeria monocytogenes and Staphylococcus aureus

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Abstract

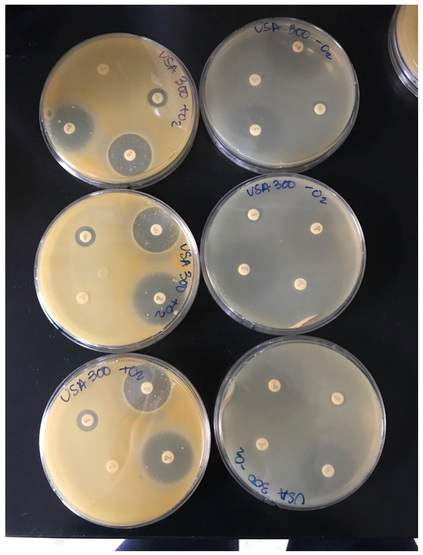
The effects of anaerobicity on the antibiotic susceptibility of two human pathogens, *Listeria monocytogenes* and *Staphylococcus aureus*, was tested using disc diffusion assays and incubating with and without oxygen. My results showed that hypoxic conditions affect the susceptibility of both bacteria to several antibiotics.

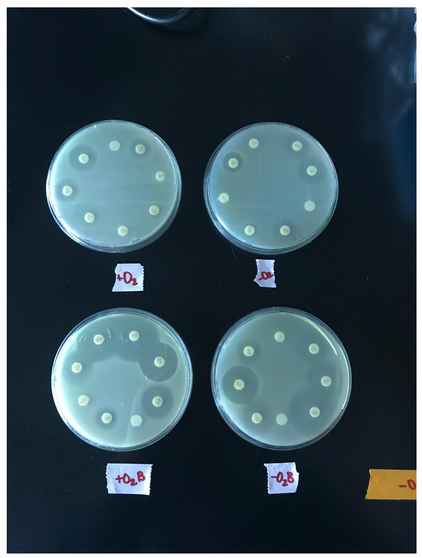
Introduction

Increased bacterial resistance to antibiotics is a growing problem in healthcare. However, there is little information on how antibiotics function during hypoxia, despite oxygen's role in the bactericidal mechanisms. This study was conducted to test susceptibility to antibiotics in anaerobic environments compared to aerobic environments.

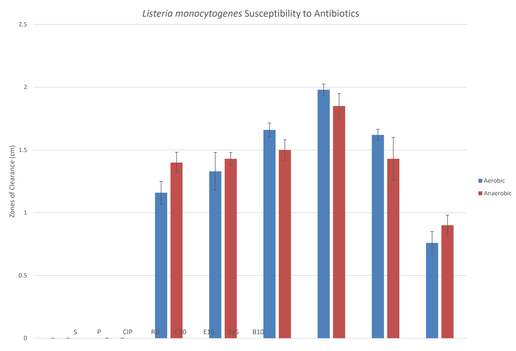
Materials and Methods

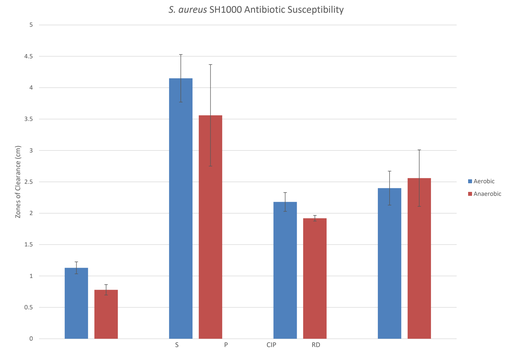
Listeria and *S. aureus* incorporated in top layer of agar. *Listeria* tested with S, TE5, B10, P, RD, CIP, C30, and E15. *S. aureus* COL, Romero, USA300, SH1000, and Newman were tested with RD, CIP, P, and S. Incubated for 48 hrs in anaerobic and aerobic environments, then zones of clearance of each antibiotic measured.

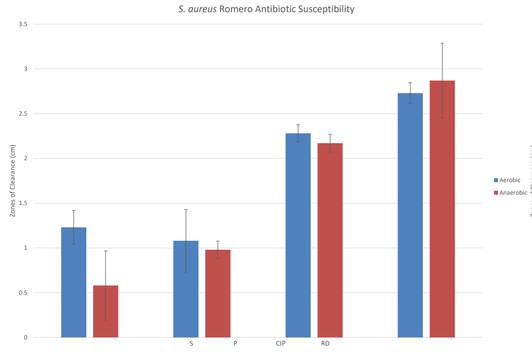


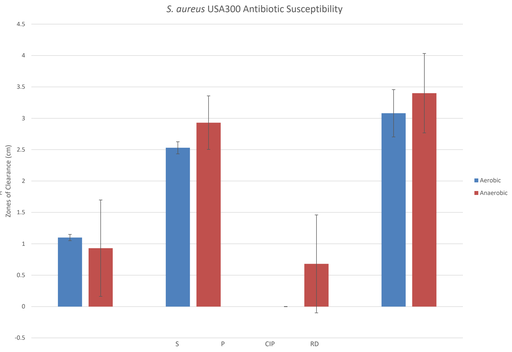


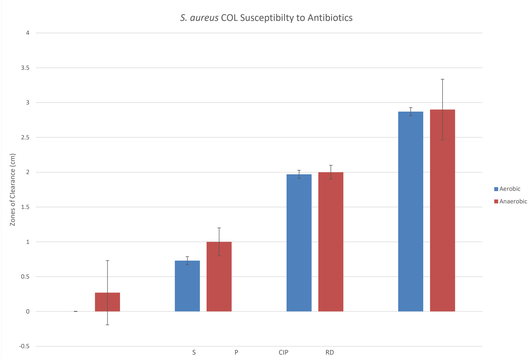
Results

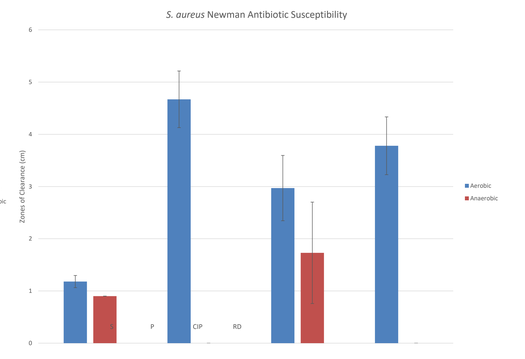












Discussion

More concrete knowledge of environmental effects on susceptibility could lead to novel ways to increase the efficacy of antibiotic treatments.