



Production of Hydrogen Sulphide Gas by Salmonella Typhi Induces in Vitro Resistance to Fluoroquinolones

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ABSTRACT

In this study, different strains of *Salmonella typhi* from clinical isolates of 100 patients were grown on TSI slants and on CLED agars. Then Antibiotic Susceptibility Tests were performed on Mueller Hinton Agar using antibiotic discs of fluoroquinolone group such as ciprofloxacin and ofloxacin from both TSI agar and CLED agar. It was found that, these two fluoroquinolones showed 84% resistance when AST was performed from the colony taken from TSI agar but sensitive when AST performed with the colonies from CLED agar.

KEYWORDS :

INTRODUCTION

Salmonella typhi produces H_2S on TSI slants, which contains Ferrous Sulphate as a soul source of sulphur. Since H_2S is considered a gas-transmitter that protects neurons and cardiac muscle from oxidative stress, it was hypothesized that bacterial H_2S likewise acts as a cellular protector. In this sense, bacteria with mutations that suppress H_2S production are sensitive to several antimicrobial compounds that exert their bactericidal activity via oxidative stress. As a result, H_2S production may induce resistance to fluoroquinolones (Ciprofloxacin and Ofloxacin). This effect was observed only when bacteria were cultured in sulfate containing media as the sole source of sulphur but, not on CLED with cysteine as the sole source of sulphur.

MATERIALS AND METHODS

Different strains of *Salmonella typhi* from clinical isolates of 100 patients was inoculated on TSI slants and on CLED agars using streaking on the slant and Koch's Plating Technique with sterile disposable nichrome loop and incubated at 37°C.

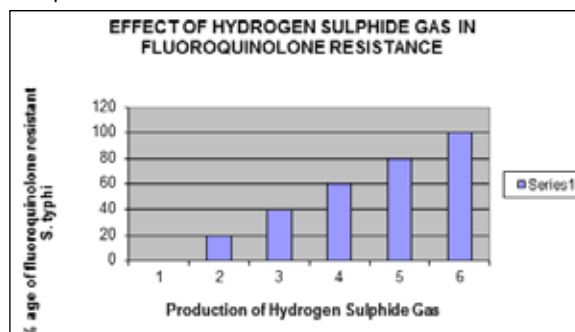
After 24 hours of incubation at 37°C, a suspension was prepared in nutrient broth from the colonies grown on those agars and compared with McFerland 0.5 concentration to perform AST using ATCC 19430 of *S. typhi* as a positive control.

Then Antibiotic Susceptibility Tests were performed on Mueller Hinton Agar using antibiotic discs such as ciprofloxacin and ofloxacin with *S. typhi* colonies grown from both TSI agar slant and CLED agar media.

RESULT AND DISCUSSION

It was found that, these two fluoroquinolones showed 84% resistance when AST was performed from the colony taken from TSI agar but sensitive when AST performed with the colonies from CLED agar.

Since H_2S is considered a gas-transmitter that protects neurons and cardiac muscle from oxidative stress, it was hypothesized that bacterial H_2S likewise acts as a cellular protector. In this sense, bacteria with mutations that suppress H_2S production are sensitive to several antimicrobial compounds that exert their bactericidal activity via oxidative stress. As a result, H_2S production may induce resistance to fluoroquinolones. This effect was observed only when bacteria were cultured in sulfate, but not on CLED with cysteine, as the sole source of sulphur.



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