Antibacterial activity and chemical composition of S. bakhtiarica bung against A. baumannii

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Background: Chemical compositions and antibacterial activity of the essential oils obtained from Satureja bakhtiarica bung against multi drug resistant Acinetobacter baumannii isolated from burned patients were evaluated.

Methods & Materials: Plant material: Chemical compositions of essential oils were analyzed by gas chromatography mass spectrometry (GC-MS) method. Antibacterial activity of essential oil was evaluated by well diffusion method. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were determined by the macrodilution method.

Results: The GC-MS spectrums showed 13 compounds, in which the highest chemical composition was related to phenol (37.36%), thymol (22.65%) and p-cymen (19.29%) compounds. The essential oil of Satureja bakhtiarica bung showed good activity against tested bacteria.

Conclusion: Plant extracts are extensively used for traditional medicine in Iran. The essential oils of many species of the genus Satureja and another medicinal plants are known to possess antibacterial properties, such as, S. brownie, S. montana, S. hortensis and S. thymbra.

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MIC & zone diameter correlation Salmonella: Interpretable guidelines need of the hour

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Background: The emergence of antimicrobial resistance is a major threat to fight against communicable diseases like enteric fever. Emerging quinolone and cephalosporin resistance necessitates the availability of alternative drugs. Azithromycin, tigecycline and carbapenems, are thought to be clinically efficacious in resistant cases but due to lack of interpretive guidelines for enteric fever, the efficacy of these potentially therapeutic options is not established in laboratory. We studied the current susceptibility pattern of blood isolates of Salmonella enterica and compared the MIC with zone diameters of disc diffusion for ciprofloxacin, azithromycin and tigecycline at a sub–Himalayan tertiary care hospital, North India.

Methods & Materials: All strains of Salmonella species, isolated from blood samples, confirmed using standard methods and subjected to susceptibility testing against chloramphenicol (30 µg), nalidixic acid (30 µg), ampicillin (10 µg), cotrimoxazole (1.25/23.75 µg), ciprofloxacin (5 µg), ceftriaxone (30 µg) azithromycin (15 µg) and tigecycline (15 µg) by Kirby-Bauer’s disc diffusion technique. The Epsilometer test used for determining the MIC of ciprofloxacin, azithromycin and tigecycline. Data was interpreted as per the Clinical Laboratory Standard Institute (CLSI) guidelines, 2012. We analyzed the data using SPSS version 16.0 for windows. We calculated the Pearson’s and Spearman’s rank correlation coefficient (r_s) between disc diffusion and MIC.

Results: Out of the total 5,208 blood samples received 54 (1.03%) isolates were Salmonella enterica. S. enterica serovar Typhi accounted for 28 (51.85%) and S. enterica serovar Paratyphi accounted for 26 (48.14%) isolates. Occasional isolates were resistant to ceftriaxone, chloramphenicol and ampicillin. Most of the strains were resistant to nalidixic acid. Ciprofloxacin resistance observed in 7 (13.96%) isolates by disc diffusion method and in 20 (37.04%) by MIC. Ceftriaxone resistance shown by 2 (3.70%) strains. The MIC and zone diameter showed significant correlation for ciprofloxacin (P=0.001), azithromycin (P=0.008) but did not correlate for tigecycline (P=0.067).

Conclusion: Changing resistance patterns, to first line drugs, emergence of nalidixic acid resistance, decreased ciprofloxacin susceptibility, emerging resistance to ceftriaxone reinforce the concept of antimicrobial recycling and necessitates a change towards evidence based treatment. Guidelines for interpreting azithromycin and tigecycline susceptibility testing against Salmonella enterica would facilitate laboratory reporting of these antimicrobials with confidence.

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