Comparison of Fermentation of Glucose, Maltose, Galactose, Terhalose, and Xylose in MRSA and MSSA Isolates from Personnels and Inpatients in Gorgan Hospitals

Somayeh Rahimi Alang*[1]; Ezzat Allah Ghaemi[2]; Reza Kazemi[3]; Ehsan Hajimohammadi[2]

1- Golestan University of Medical Sciences, Gorgan, Iran

2- Department of Microbiology , School of Medicine, Golestan University of Medical Sciences, Gorgan, Iran

3- Young Researchers Club, Islamic Azad University, Lahijan, Iran

colony83@yahoo.com

Background & Objectives: Methicillin resistant *Staphylococcus aureus* (MRSA) is a major and important pathogen causes infection and mortality in the world. The mec A gene in *Staphylococcus aureus* leads to production of new penicillin-binding protein called PBP2a. This change in the cell wall may change some phenotypic properties. The aim of this study was the comparison of sugars fermentation of glucose, maltose, galactose, trehalose and xylose in MRSA and MSSA isolates.

Methods: Total 188 isolates of S. aureus separated from 111 inpatients and 77 personnels in Gorgan Hospitals were evaluated. mec A gene primers was used to determine resistance to methicillin by PCR methods. Sugar fermentation carried out in phenol red broth base medium, containing glucose, maltose, galactose, trehalose, or xylose, and was checked discoloration after 24 hours incubation in 37 ºC. $P<0.05$ was use as meaningful.

Results: mec A gene was detected by PCR in 61 isolates. Only glucose fermentated by all isolates of *Staphylococcus aureus* in 24 h, but the fermentation of glucose in MRSA and MSSA isolates were 10 (16.4%) and 8 (6.3%), respectively ($P=0.02$). The ability ferment trehalose, xylose and galactose in MRSA isolates were 55 (90.2%), 7 (11.5%) and 57 (93.4%) and in MSSA isolates were 126 (99.2%), 3(2.4%) and 105 (86.7%), respectively; the differences between MRSA and MSSA isolates was statistically significant ($P<0.05$).

Conclusion: Resistance to methicillin in *S. aureus* isolates is associated with increscent ability to sugars fermentation; the ability to ferment xylose was more specific, especially. That this phenomenon may increase pathogenesis in MRSA isolates. This may be due to acceleration of suger transport in the presence of PBP2a which it need more research.

Keywords: *Staphylococcus aureus*; Methicillin resistance; Sugar Fermentation; Mec A; PBP2a