

# **Assessment of Screening Tests for Methicillin-Resistant Staphylococcus aureus in Patients Undergoing Surgery by Molecular (PCR) and Culturing Methods**

*Yosefzadeh Chabok Sh.(M.D)1- Hemmati H.(M.D)1- Mohtasham Amiri Z.(Ph.D)1- Ashoorizadeh B.(M.D)1-Bashizadeh Fakhar H.(M.Sc)1- Kazem Nejad E.(Ph.D)1*

**\*Corresponding Address:** Trauma and Road Traffic accident Research Center, Poursina Hospital, Rasht, IRAN

**Email:** Haniyehfakhar@yahoo.com

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## **Abstract**

**Introduction:** Staphylococcus aureus is the main cause of surgical site infection, causing morbidity and mortality in patients undergoing surgery. Despite a lot of research on the best diagnostic method and Methicillin-Resistant Staphylococcus aureus (MRSA) screening in patients undergoing surgery, the most appropriate diagnostic method is still unknown. The question is whether Rapid Molecular (PCR) or the traditional microbial culture is the most suitable method?

**Objective:** This study aimed at systematic reviewing of articles to evaluate molecular method in MRSA diagnosis and the necessity of screening patients before and after surgery to prevent infections and its subsequent outcomes e.g.mortality.

**Materials and Methods:** Many searches in databases including the digital and medical inlm library and sites such as Science, JAMA, BMD, Springer were done since 2007 to August

2010. In total, 118 studies were selected regarding the following keywords; site surgical infection, Staphylococcus aureus, PCR, and culture. Two independent persons who selected the articles evaluated the designs of the studies and extracted the information using blinded method objectively. After a complete study of other articles, 50 articles were also eliminated, and 8 articles were

finally entered the study. Data of culture diagnostic methods and PCR and the statistics of infection prevalence in surgical site were analyzed by Cumulative Pooled analysis.

**Results:** Eight randomized clinical trials of culture methods and PCR had been studied in MRSA diagnosis and screening in different surgeries. The average duration of study was 11.6 months in all articles. The relative risk of site surgical infection was 7.3% with MRSA in all articles and CI was 95 % (0.696, 0.367). The conformity between culture and PCR was 91%, PCR sensitivity 99.2% and PCR specificity 82.2%. The rates of MRSA infection before (0.65 %) and after (0.35 %) surgery were significantly different with screening. When screening was applied, the rate of infection with 0.95% CI decreased to 28.9% - 31%.

**Conclusion:** Findings confirm the necessity of screening before surgery in order to determine the antibiotic prophylaxis preceding the surgery in those who carry MRSA. Thus, considering the specificity and sensitivity of PCR to microbial culture, molecular method is rapid and effective in diagnosis and screening of the patients who undergo surgery.

**Key words:** Cross infection/ Methicillin- Resistant Staphylococcus- sonorous/ Postoperative Complications/ Surgical Wound Infection