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SUSCEPTIBILITY PATTERNS AND SCC*mec* TYPES OF *METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS* (MRSA) ISOLATES FROM SKIN AND SOFT TISSUE INFECTION (SSTI) PATIENTS

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INTRODUCTION

Methicillin resistant Staphylococcus aureus (MRSA) is a major infection problem both in hospital and community setting due to resistance to antimicrobials. The mechanism of resistance based on *mec*A gene-part of *Staphylococcal cassette chromosome mec* (SCC*mec*)[1]. Now about 8 type of SCC*mec* were identified. The origin of SCC*mec* type were type I for multiresistant phenotype and type IV for nonmultiresistant phenotype[2]. Type II and type III were originated from type I SCC*mec*, while others types were originated from type IV SCC*mec*[3]. Skin and soft tissue infection was commonly found in community setting but now many patients especially with immunocompromised condition also often appearing these infections[4]. Exploring of genotype and phenotype of MRSA were important to assist diagnosis, treatment and prevention of infection[5].

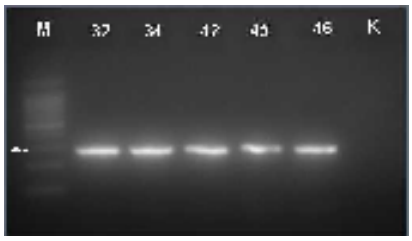
METODE

The design of study was observational explorative with laboratory approach to identify susceptibility patterns and SCC*mec* type of MRSA isolated from SSTI patients from Moh. Hoesin General Hospital Palembang. Antimicrobial Susceptibility Testing (AST) was diffusion method. PCR multiplex to identify the SCC*mec* according to Zhang et al (2005) with modification[6].

RESULT AND DISCUSSION

Staphylococcus aureus were 33 (71,7%) causing agent of 46 SSTI patients, another 28,3% of these infection were caused by *Acinetobacter calcoaceticus*, *Klebsiella pneumoniae* and *Escherichia coli*. PCR result to determine *mec*A gene were found in 22 samples (46,8%). This prevalence is high category. MRSA prevalence in the world were among 2 – 70%. The lowest prevalence was in Netherland due to successful of MRSA controlling program[7]. Multiplex PCR with modification results 15 isolates of MRSA have SCC*mec* type III and 1 isolate has SCC*mec* type I, unfortunately 6 isolates were not identified. Type III SCC*mec* was commonly found in hospital setting. It was very interesting because type I SCC*mec* found in our hospital. Type I is a classic type indicated originally of MRSA was from this area not import from another area[8]. Another 6 samples MRSA which unidentified of SCC*mec* could be cause unmatched of PCR primers[9]. Based on antimicrobial resistance testing diffusion method, we found 13 samples with SCC*mec* type III were multiresistant, 2 samples were not multiresistant. MRSA with SCC*mec* tipe I was multiresistant phenotype. Two of

these resistant group (SCC*mec* type I – III) were nonmultiresistant. It was indicated any change in susceptibility pattern in biochemical level but not in genetical level yet[10]. There were no type IV of SCC*mec* because the patients were immunocompromised group such as diabetic complication. Commonly inpatients in hospital has SCC*mec* type III.



Picture 1. PCR result of SCC*mec* type III amplicon 280 bp. M is marker. K negative control.

Gambar 3. PCR result of SCC*mec* type I amplicon 600 bp. M is marker.

CONCLUSION

MRSA with SCC*mec* type III was a significant agent of SSTI in our hospital and there were initial indicated any change in susceptibility patterns of MRSA.

REFERENCES

1. Chambers HF. Methicillin resistant in staphylococci: molecular and biochemical basis and clinical implications. Clin Microbiol Rev. 1997;10:781-9.

2. Naimi TS, LeDell KA, Sabetti KC, *et al*. Comparison of Community and Health Care Associated Methicillin-resistant *Staphylococcus aureus* Infection. JAMA 2003; 290: 2976-84.

3. Fey PD, Salim BS, Rupp ME, Hinrichs SH, Boxrud DJ, Davis CC, Kreiswirth BN, Schlievert PM. Comparative molecular analysis of community or hospital-acquired methicillin-resistant *Staphylococcus aureus.* Antimicrob Agents Chemother 2003; 47: 196-203.

4. Daum RS. Skin and Soft Tissue Infection Caused by Methicillin-resistant *Staphylococcus aureus.* Engl J Med 2007;357:380-90.

5. Graffunder EM and Venezia RA. Risk factors associated with nosocomial Methicillin-resistant *Staphylococcus aureus* (MRSA) infection including previous use of antimicrobials. J Antimicrob Chemother 2002;49:999-1005.

6. Zhang K, McClure J, Elsayed S, Louie T, Conly J. Novel multiplex PCR assay for characterization and concomitant subtyping of Staphylococcal Cassette Chromosome *mec* types I to V in Methicillin-Resistant *Staphylococcus aureus* . J Clin Microbiol 2005; 43:5026-5033.

7. Vos MC, Ott A,Verbrugh HA. Successful Search-and-Destroy Policy for Methicillin-Resistant *Staphylococcus aureus* in The Netherlands J. Clin. Microbiol. 2005;43: 2034–2035

8. Arakere G, Nadig S, Swedberg G, Macaden R, Amarnath SK, and Raghunath D.(2005). Genotyping of Methicillin-Resistant *Staphylococcus aureus* Strains from Two Hospitals in Bangalore, South India. *J. Clin. Microbiol*. 2005;43:3198–3202

9. Chongtrakool P, Ito T, Ma XX, Kondo Y, Trakulsomboon S, Tiensasitorn C, Jamklang M, Chavalit T, Song JH, Hiramatsu K. Staphylococcal Cassette Chromosome mec (SCCmec) Typing of MRSA Strains Isolated in 11 Asian Countries: a Proposal for a New Nomenclature for SCCmec Elements. Antimicrob. Agents Chemother. 2006; 50: 1001-1012

10. Daum RS, Ito T, Hiramatsu K, Hussain F, Mongkolrattanothai K, Jamklang M and Vavra SB. A Novel Methicillin-Resistance Cassette in Community-Acquired Methicillin-Resistant *Staphylococcus aureus* Isolates of Diverse Genetic Backgrounds J Infect Dis 2002;186:1344–47.