Analysis of Methicillin-Resistant *Staphylococcus aureus* (MRSA) and Methicillin- Susceptible *Staphylococcus aureus* (MSSA) infection in Hospital Pakar Sultanah Fatimah (HPSF)

NUR HAFIZAH BINTI MOHAMAD NASIR

Dissertation submitted in partial fulfillment of the requirements for Diploma in Medical Laboratory Technology

Faculty of Health Sciences

September 2014
DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations of Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student: Nur Hafizah Binti Mohamad Nasir

Student I.D. No.: 2012655858

Programme: Medical Laboratory Technology

Faculty: Health Science

Dissertation Title: Analysis of Methicillin-Resistant *Staphylococcus aureus* (MRSA) and Methicillin- Susceptible *Staphylococcus aureus* (MSSA) Infection in HPSF

Signature of Student:

Date: SEPTEMBER 2014.
ABSTRACT

Analysis of Methicillin-Resistant *Staphylococcus aureus* (MRSA) and Methicillin-Susceptible *Staphylococcus aureus* (MSSA) Infection in HPSF

**Background and objectives**: The aim of the present study was to observe and analyze distribution of patient infected with Methicillin-Resistant *Staphylococcus aureus* (MRSA) and Methicillin-Susceptible *Staphylococcus aureus* (MSSA) infection in Hospital Pakar Sultanah Fatimah, Muar based on age and gender of patient. Age and gender affect the number of patient infected with either MRSA or MSSA organism. MRSA organism is known as major nosocomial pathogen worldwide. It is more dangerous compared to MSSA since it shows resistance to beta-lactam antibiotics. For MRSA, infection can occurred either HA-MRSA (Healthcare-associated MRSA) or CA-MRSA (Community Acquired MRSA).

**Method**: Identification test such as biochemical test, gram stain and culture on media like Sheep Blood Agar, Mannitol Salt Agar and DNase agar were done. When all the characteristics show that the organism grow is *Staphylococcus aureus*, the procedure is proceed with antimicrobial susceptibility test (AST) to specify it into either MRSA or MSSA after have been tested with oxacillin disc especially and the other disc generally. For method of research, a letter for permission to collect data is made to give to the Chief of Pathology Department. After passed, retrospective study whereby previous data was collected based on age and gender of patients. Data is analyzed and fully dissertation is written.

**Result**: Based on the observation of the result on age, old people tend to be more infected with MRSA organism while adult people dominates the MSSA infection. According to statistical analysis performed by using Graphpad prism software, there is significant difference between age and number of patient infected with MRSA and MSSA infections. In terms of gender, statistical analysis shows that there is no significance difference in number of patients even though male show highest number for both MRSA and MSSA infection. For type of samples, majority sample received from site of infection is tissue.
Discussion: According to age, old people tend to be more infected with MRSA infection compared to adult because it may be due to weakened immune system. Statistical analysis for age also shows significant result. Consequently, null hypothesis made can be rejected. For gender, even though male shows higher number for both MRSA and MSSA infection compared to female, statistical analysis shows no significant difference between gender and number of patients infected. As a result, null hypothesis made cannot be rejected. Meanwhile for type of samples, tissue is the most sample received. This may be due to habitat of S.aureus itself in which is on skin.

Conclusion: In short, MRSA is dangerous since it show resistant to beta-lactam antibiotics. Precaution step should be taken in order to prevent our body from being infected by both organisms. We also can conclude that age affect the number of patient infected with either MRSA or MSSA since it shows significant result but not for gender.

Key words : MRSA, MSSA, Hospital Muar.
ACKNOWLEDGEMENT

In the name of Allah The Most Gracious and The Most Merciful,

Assalamualaikum warahmatullahi wabarakatuh.

Alhamdulillah, finally I have succeed in finishing my single final year project in diploma MLT. Thanks to Allah for giving me the strength and patience along the time of completing this dissertation.

Foremost, I would like to express my sincere gratitude to my local preceptor, Puan Fatimah Hashim, my supervisor, Madam Wan Ismahanisa Ismail and co-supervisor, Madam Nur Hidayah Abdul Rahim for their continuous support of my Diploma study and dissertation done in final year entitled “Analysis of Methicillin Resistant Staphylococcus aureus (MRSA) and Methicillin Susceptible Staphylococcus aureus (MSSA) infection in Hospital Pakar Sultanah Fatimah, Muar”, for their patience, motivation and enthusiasm. Their guidance helped me a lot in all the time of research and writing of the thesis. I could not have imagined having a better supervisor and co-supervisor for my diploma study.

Besides them, I would like to thanks also to the Chief of Pathology Department, Dr. Norafidah Md Din for giving me permission to collect data required for my dissertation. Without her permission, I might not get data needed. Not only that, my acknowledgement also goes to En Helmi Bin Ujir, science officer in microbiology laboratory for his support and guidance in helping me to finished up the thesis. He give many idea to me and without his help, maybe this project cannot be run smoothly. My sincere thanks also goes to Microbiology Specialist, Dr. Lim Bee Bee in giving cooperation in helping me and giving some knowledge to me. In addition, I would like to thanks my parents for giving me support and advice in completing the research. Not only that, thanks for their continuous guidance and encouragement since I was small. Without their prayer, I might not be able to further my studies in diploma until now.

Last but not least, I thanks to my fellow labmates in Hospital Muar, Nur Fakhira Khadis, Nur Syamimi Md Lasim, Haziq Zailani, Muhammad Zahin Zainudin and Faiz Musa for helping me upon the completion of my research project.