UNIVERSITI TEKNOLOGI MARA

IDENTIFICATION OF PATIENTS ARM MICROORGANISMS TO IMPROVE EXISTING DISINFECTION PRACTICES IN PHLEBOTOMY

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Thesis submitted in partial fulfillment
of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any 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 for Undergraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Phlebotomist plays a crucial role in the pre-analytical phase as they need to perform venipuncture for collecting blood specimen for most of the blood tests. Before a venipuncture process, the patient's antecubital areas need to disinfect thoroughly to minimize contamination, particularly from human skin normal flora. The hand microbiome compositions are affected by many sources of variability, both intrinsic and extrinsic factors. The study of hand microbiome can help in understanding host-organism relationships thus helping in the use of potent antimicrobial agents on the patient's arm to maximize disinfection prior to blood donation or blood culture collection, as these two are critical for microbiological contamination. The objectives of this study are to identify the commonest isolated microorganisms at the antecubital fossa of study group by gram stain and biochemical test, to determine the contribution of demographic and hygienic practice to the prevalence of the microorganisms, and to identify whether the routine aseptic technique is adequate to minimize the risk of infection. In this study, the most isolated organisms were *Staphylococcus epidermidis* (46%) (12/26), followed by another coagulase-negative *Staphylococcus* (CoNS) (35%) (9/26), and *Staphylococcus capitis* (19%) (5/26). There was no significant association between study group characteristics (gender, dominant hand, daily bath frequency, lotion or perfume usage, and preference of clothes) with the prevalence of the microorganism present ($p>0.05$). The mean $\log_{10}$ of colony-forming units (CFUs) pre- and post-disinfection with 70% isopropyl alcohol shows a significant reduction (Paired t-test, $p=0.002$) indicating appropriate measures of current practice in eliminating the risk of microbiological contamination. In conclusion, the presence of normal floras that can become pathogens in certain individual ascertained that disinfecting the skin before venipuncture is a crucial step to avoid false-positive blood culture and to decrease contamination of blood and blood products by both resident and transient skin floras. By studying the microbiome on the antecubital fossa, an approach and finding new antiseptic agents to improve antimicrobial agent efficacy in eliminating resident and transient floras prior to blood donation or blood culture collection can be improved.

Keywords: *Venipuncture, antecubital fossa, disinfection, blood donation, blood culture, bacteria.*