

Research Article

High Occurrence of *Staphylococcus aureus* Isolated from Fitness Equipment from Selected Gymnasiums

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Introduction. *Staphylococcus aureus* is a leading cause of cutaneous bacterial infection involving community. **Methods.** In this study, a total of 42 swab samples were collected from the surface of various fitness equipment such as back machines, exercise mats, dip stations, dumbbells, and treadmills. Identification of the bacterial isolates was conducted using biochemical tests and further analysed molecularly using the PCR method targeting *nuc* gene (270 bp). The *nuc* gene encodes for the thermonuclease enzyme, a virulent factor of *S. aureus*. **Results.** The findings showed 31 out of 42 swab samples (73.81%) were positive with *S. aureus*. **Conclusion.** This study showed that gymnasium equipment is a potential reservoir for *S. aureus* and might play an important role in transmitting the pathogen to humans. **Objective.** This study was undertaken to assess the presence of *S. aureus* on the surface of fitness equipment from selected gymnasiums in Kuching and Kota Samarahan, Sarawak (Malaysia).

1. Introduction

Staphylococcus aureus is a Gram-positive and nonmotile cocci bacterium that is most common in soft tissue and skin infection [1]. Within the genus, there are 39 valid species. Animal and human pathogenic species include *S. aureus*, *S. intermedius*, *S. delphini*, *S. hyicus*, *S. schleiferi* subsp. *coagulans*, *S. pseudintermedius*, *S. equorum*, *S. xylosus*, *S. carnosus*, *S. simulans*, *S. saprophyticus*, *S. succinus*, *S. warneri*, *S. vitulinus*, *S. pasteuri*, *S. epidermidis*, and *S. lentus* [2]. *S. aureus* is a normal microflora of the skin, nose, and mucous membrane of humans where colonisation is more common than infection. Skin infection can occur if the cutaneous barrier is disrupted or damaged [3]. Any individuals that have been colonised by the bacteria are susceptible to any consequential infections and worse among patients of type 1 diabetes, intravenous drug users, patients undergoing haemodialysis, surgical patients, and patients with the acquired immunodeficiency syndrome (AIDS) [4].

The spectrum of clinical manifestations can be from minor skin infections to life-threatening illnesses. Skin infections include pimples, impetigo, boils (furuncles), cellulitis, folliculitis, carbuncles, scalded skin syndrome, and abscesses, while life-threatening illnesses include pneumonia, meningitis, osteomyelitis, endocarditis, toxic shock syndrome (TSS), bacteremia, and sepsis [5]. Procurement of skin infection is predominantly via skin contact with infected surfaces. The common high-risk groups are nursery children, patients in hospitals, prisoners, athletes, and military personnel [6, 7].

There are two trends of *S. aureus* infection. First is the increase of cases in community-acquired (CA) and hospital-acquired (HA) infection as they increased the use of intravascular devices. The second trend is highly selective antibiotic resistance which increases the infections caused by methicillin-resistant *Staphylococcus aureus* (MRSA) [4]. MRSA is an emerging strain of *S. aureus* that is resistant to several antibiotics acquired by *mecA*, a methicillin-resistant