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Pathogenicity of *Staphylococcus aureus* and affinity to produce staphylokinase

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ABSTRACT

This research investigates *Staphylococcus aureus* pneumonia in mice by oral injection**.** Infection rate (65%) of histopathological testing reveals a number of changes like the inflammation that is expressed by polymorphonuclear leukocytes. This bacterium is typically responsible for a lung infection. Inflammatory reactions resulted from this infection may cause catching the infection of the lungs like increased neutrophilic inflammation and vascular leakage of serum proteins into the lung to name a few. This study suggests that Staphylokinase production may be a typical virulence factor by means of *Staphylococcus aureus* that inhabit and lead to fibrinolysis and invasive infections.

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INTRODUCTION

Traditionally, *Staphylococcus aureus* is one of the most common types of STDs in the community. *Staphylococcus aureus* become more susceptible to infection and are smaller than the source of the cluster caps and the front

1. Systemic infections such as osteomyelitis, pulmonary embolism, bacteremia, Staphylococcus aureus and brain maps, and eventually modulate tissue disease (Tong S. Y *et al.,* 2015),
2. Surface lesions such as wound infections,
3. Toxins such as Poisonous Shock Syndrome, Pasteurized Skin Syndrome and Food Poisoning (Varrone J.J *et al.,* 2014).

To protect against infection of the stomach and the prevention of genetic and chemical diseases (Shah, S. N *et al.,* 2017).

It is clear that the mechanisms of internal defense are complete through discourse between the future communication between the epithelial surface receptors and bacterial agents, either directly or indirectly. This can give an effect on a particular type of injury (Mohanasrinivasan V *et al.,* 2014).

It is known that Staphylococcus aureus, the tolerance scale during, was the main cause of pneumonia among persons (Douglas S. Clark 2016).

The proportion of pneumonia in the gold aluminium series (Berube B. J., and Bubeck Wardenburg J. 2013).

Staphylococcus aureus produces proteins and phytochemical toxins, which have an activity for cytotoxic cells and toxins that form hollow B pores in the plasmid membrane and lead to leakage of the cell substance and decomposition into the collective cells (David, M. Z., and Daum R. S. 2013).

This type of protein is Staphylokinase, which is associated with α-specific properties of bacteria (Jusko M., *et al.,* 2013).

Staphylokinase is an amino acid protein 136 sources by some strains of Staphylococcus aureus and is associated with the stimulant plasminogen of fibrin, which activates the therapeutic function, and some countries have proven to have an effective alternative to the thrombosis laboratory with

available drugs (Jusko M., *et al.,* 2013; Nihal Osman Adam, *et al.,* 2016).

In this study, thirty bacterial strains were found to infect the lung and reveal the pathogen of the Staphylococcus aureus in the lung. Also, this study is complicated to produce staphylokinase for the analysis of cassine degradation and agar-plasma agar resistance. A morphological characterisation is called to confirm the occurrence of Staphylokinase and Staphylococcus aureus.

MATERIALS AND METHODS

The microbial strains: Three strains of Staphylococcus aureus (from patients at Al Zahrawi Hospital from August to October 2017) were vaccinated on agar pumped brain heart and flexible heart injection solution and incubated at 37°C for 24 hours. Then, the wafers were saved ready for use again (Finegold M. and Martin J. 1982).

Animals in the Experiment: The researcher randomized six adult BALB / C mice from both sexes to three groups of mice in each group. In addition, 2.7107cfu / g (0.5 ml) of oral bacterial solution was injected into each mouse (Sultan 2001). The mice were killed seven days later. Samples of lung infection were extracted and stored in formalin solution (10%) and were preserved for histological examination.

Histological examination: Histological sections were prepared and stained with Eosine and haematoxylin (Luna L. G. 1968).

Staphylokinase Production Test (SAK)

Three test strains were tested for Staphylococcus aureus for SAK production, explained by (i) casein analysis and (ii) plasma agar testing of protein and plasma SAK proteins (Nihal Osman Adam, *et al.,* 2016; Michael H. 2014).

Casein hydrolysis assay: This assay was prepared using non-fat dry milk (casein), serum and nutrient agar. The serum was prepared by collecting 5 ml of blood. Blood coagulation was left for 5 hours. The yellow color part and serum were used (Nihal Osman Adam, *et al.,* 2016; Michael H. 2014).

Heated plasma agar assay: The nose of the heated plasma agar is a vital route. The raw feed was prepared by centrifugation at 10,000 rpm for 25 minutes and 15 ml of nutrient agar. The plasma was prepared by collecting 10 mL of the following anticoagulant blood (EDTA). The blood was centrifuged at 13000 rpm for 10 minutes: ultrafiltration work and plasma operation. The plasma was then heated to 56°C for 20 minutes. The plasma was then mixed with nutrient agar, and the technique was used for the diffusion of plasma enzyme activity (Jusko M., *et al.,* 2013; Nihal Osman Adam, *et al.,* 2016; Shamran, A. R, *et al.,* 2018).

RESULTS

This research suggests that Staphylococcus aureus is an important cause of bacterial pneumonia. Staphylococcus aureus pneumonia is increasing through the lung and alveolar space. Highlights the leakage of blood vessels from the bitter proteins in the respiratory pathway. Fibrinolysis is an important feature of infection such as pneumonia. Send Figure 1 variables in the neck.

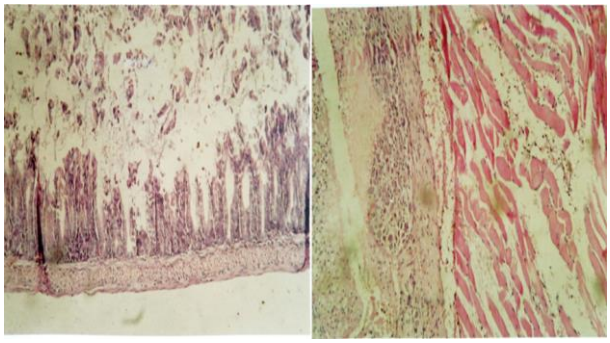

Figure 1: Staphylokinase activity using casein hydrolytic assay

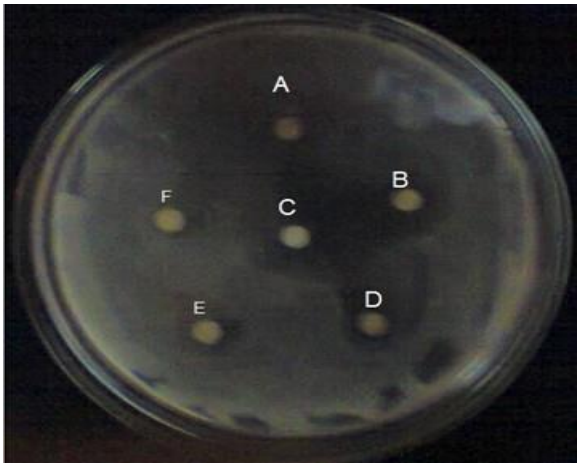

Figure 2: The halo zones of casein hydrolytic assay

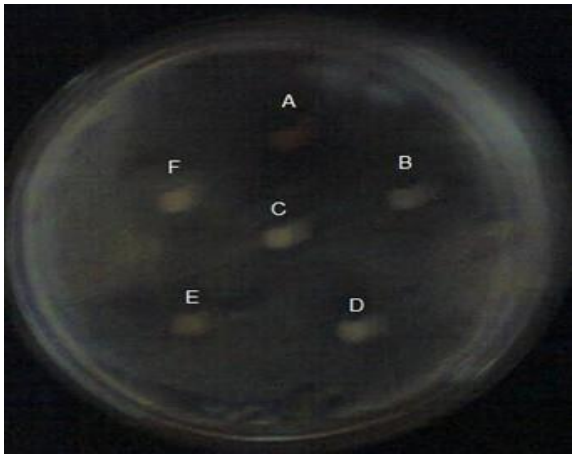

Figure 3: The halo zones of Heated plasma agar assay

The acidity modulus of the acid samples A, B, C, D, E and F produced hollow areas at 3.75, 3.5, 3.5, 3.5, 2.5 and 2 mm, respectively (see Figure 2). After heating at 37°C on heated plasma agar plates, there is the formation of fibrous hollow areas and one of the brides A, B, C, D, E, F in 3.75, 3.5, 3.5, 2, 1 and 0.5 mm, respectively (See figure 3) (Bettina Loffler, *et al.,* 2013).

DISCUSSION

The results of this study show the emergence of plasma membrane proteins, which indicate a prominent mechanism of Staphylococcus aureus in the lungs, α-toxin and β-toxin of the Staphylococcus aureus, which triggers the release of pathogenic bacteria. In addition, these are consistent with (Nihal Osman Adam, *et al.,* 2016; Stem A., *et al.,* 2014; Llamas-Alvarez A. M. *et al.,* 2017). The most important factor in cluster poisoning is the severity of the internal immune response of the bait animals. It seems to the study that the immune response of multi-nuclei (PMNS) is critical in the removal of Staphylococcus aureus. PMNS itself was thought to be the only component of eclampsia in the host response to Staphylococcus aureus (Richard Hunt 2018). Staphylococcus pneumonia of Staphylococcus aureus is attributed to the deadly infection of Panzo-Valentin Leucosidine (PVL), one of the causes of necrosis pneumonia. In addition, Staphylococcus aureus causes 1-10% of pneumonia among the population and 20-50% of pneumonia in hospitals (Chandrappa Uegha Singh C. P., *et al.,* 2017). These bacteria may not cause spatial abscesses and leaks that spread with the blood to the lungs leading to pneumonia Bloody. Staphylococcus aureus is one of the common causes of acquired opportunistic and hospital infections. This lens pneumonia, osteoarthritis, osteoarthritis, bacteremia, inflammation of the cardiac membrane. The mechanisms of virulence such as antibiotic resistance such as Staphylokinase, capsule, coagulation, lipase, hyaluronidase protein, proteins, phononucleotin and toxins. And leucocidin (PVL) and hemolysins soluble modalism in phenol (Nisha Nair, *et al.,* 2014; Srinvasan V., *et al.,* 2013; Al-Grawi, E.D.C., and G.R.L. Al-Awsi. 2018).

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