Microbial pattern of pressure ulcer in pediatric patients

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Abstract. Pressure ulcer (PU) is a localized trauma to the skin and or tissue beneath which lies in bony prominence due to pressure or pressure that combines with a sharp surface. Several studies have found that PU is a common problem in pediatrics population. Infection at the site of a PU is the most common complication in which the PU may host a resistant microorganism and may turn into a local infection that will be the source of bacteremia in hospitalized patients. To reveal which is the most common microbial species that underlie in pressure ulcer of pediatrics patients. A cross-sectional study was conducted in July-September 2017, involving 18 PU pediatric patients in Haji Adam Malik Hospital. To each subject, swab culture from the ulcer was made in microbial laboratory in Haji Adam Malik Hospital to determine the microbial pattern. This study found that the most common microbial pattern in pressure ulcers of pediatrics patient in Haji Adam Malik Hospital is Acinetobacter baumannii (22.2%).

1. Introduction
Pressure ulcer (PU) is a localized trauma to the skin and or tissue beneath which lies in bony prominence due to pressure or pressure that combines with a sharp surface.[1] Pressure ulcer is a common clinical problem in hospitalized patients. This problem is associated with physical and psychological burden, increasing morbidity, mortality and cost for clinical care.[2] Data on adult ulcers have received extensive observations while in infants and children population are not widely known.[3] Several studies have found that PU is also a common problem in pediatrics population.[4] The prevalence of childhood hospital ulcers varies from 3% to 35%.[5] In pediatrics population, the risk factors for the formation of known ulcers include immobility and decreased skin sensitivity.[6] Regardless, infants or sick children have limitations in communication skills so they are large populations who are at risk to PU formation.[7,8] Discontinuation of skin tissue such as epidermal peeling or tearing of the skin due to friction or plaster especially in neonates and infants in critical conditions will increase the risk of septicemia as well as complications and high mortality.[7] The formation of a PU will make a bad experience for infants, children and families who have an impact on self-appearance, prolonged hospitalization, establishment of infection complications and possibility of complex wound care.[9] A pressure ulcer occur as a result of an active metabolic and inflammatory process that is initiated when sufficient pressure is applied on the skin. A variety of microorganism can colonize and subsequently multiply in areas of devitalized necrotic tissue. Such bacterial growth can interfere with the normal process. Even more serious complication may develop if the microorganisms penetrate the surrounding tissues.[10] This study is to determine the most common bacterial at the site of PU in pediatric patients that serve as basic data for further study to establish empirical treatment in Haji Adam Malik Hospital.
2. Methods
We perform an observational study. A total of 18 pressure ulcers pediatric patients from July to September 2017 that were hospitalized in Haji Adam Malik Hospital were eligible for the study, with inclusion criteria are namely: PU patients range from 0-18 years old and free from topical antibiotics on the site of the PU. Swabbing method was used to collect the pus on PU and using a transport media the swab then delivered to Microbiological Laboratory in Haji Adam Malik Hospital for bacterial culture.

3. Results
The microbial pattern of PU in pediatric patients are in Table 1 below.

| Organism                      | n  | %   |
|-------------------------------|----|-----|
| Acinetobacter baumannii       | 4  | 22.2|
| Staphylococcus aureus         | 3  | 16.6|
| Pseudomonas aeruginosa        | 3  | 16.6|
| Klebsiella pneumonia          | 3  | 16.6|
| Proteus mirabilis             | 1  | 5.6 |
| Burkholderacepacia            | 1  | 5.6 |
| Providiencia stuartii         | 1  | 5.6 |
| Kocuriakritinae               | 1  | 5.6 |
| Enterococcus faecalis         | 1  | 5.6 |
| **Total**                     | **18** | **100** |

From table 1 above, Acinetobacter baumannii has the highest percentage (22.2%) amongst the 18 PU pediatric patients.

4. Discussion
The most common bacteria found in this study were Acinetobacter baumannii found in 4 patients (22.2%). Acinetobacter baumannii is a gram-negative bacteria that is aerobic, pleomorphic and non-motile. Being opportunistic and known to be associated with hospital-acquired infections.[11] In total, when compared to gram negative and positive bacteria, in this study the most common germs are gram-negative bacteria. The same results were in the study by Cahyopoetra et al., the most common cause of pressure ulcers in RS Wahidin Sudirohusodo was gram-negative bacteria.[12] The same results also found from pressure ulcer on adults in Haji Adam Malik Hospital, whereas the most common bacteria is also Acinetobacter baumannii.[13] Similarly to what was in adults, aerobic and anaerobic flora were also present in about half of the decubitus ulcer in children.[10]

5. Conclusion
This study found that Acinetobacter baumannii is the most common bacterial at the site of pressure ulcer in pediatric patients from July to September 2017 in Haji Adam Malik Hospital.

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