

UNIVERSITI TEKNOLOGI MARA



**C-REACTIVE PROTEIN (CRP) AS AN INDICATOR OF
BACTERIAL INFECTION IN CHILDREN**

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ABSTRACT

C-REACTIVE PROTEIN (CRP) AS AN INDICATOR OF BACTERIAL INFECTION IN CHILDREN

The aim of the present study is to determine the relationship between C-reactive protein (CRP) level and blood culture in children suspected with bacterial infection. In this study, serum CRP level was used to diagnose the present of bacterial infection in patient. Data were randomly collected and extracted from the Laboratory Information System (LIS) in Hospital Tengku Ampuan Afzan (HTAA), Kuantan, Pahang from 50 patients that performed CRP test and blood culture test together. Based on the data, diagnosis of patients were categorize into three groups including true bacterial infection, probable bacterial infection and non-bacterial infection. Out of 50 patients, 3 patients were detected with bacterial infection. These 3 patients clinically have high serum CRP level with positive blood culture. 6% cases were diagnosed as bacterial infection based on their high serum CRP level with positive blood culture while 94% cases were diagnosed as non-bacterial infection based on their low serum CRP level with negative blood culture. In conclusion, C-reactive protein (CRP) cannot be considered as a valuable marker for early diagnosis of bacterial infection in this study but it show more valuable information for diagnosing bacterial infection if performed with other test.

Key words : C-reactive protein, Blood culture, Children, Bacterial infection.

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

Bacterial infection can cause high morbidity and mortality especially in children. The most common test used in clinical laboratory for detecting infection in patient is erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) level. CRP is an acute phase reactant that produces in the liver (Sucilathangam, 2012). However, the study prove that CRP level provide more valuable information about the infection rather than ESR value. CRP test can also differentiate between bacterial and viral infection (Bpac, 2005). CRP is the family of protein that has five identical subunits. CRP has several main functions such as CRP act as anti-infective. It can attracts particles for phagocytosis and activate complement via the classical pathway. CRP also acts as anti-inflammatory actions. It prevents the systemic inflammation by the release of neutrophils from the blood vessels and preventing white cells adhesion to vessels in non-inflamed tissues. Besides that, CRP can acts as scavenging action which bind to cell that are undergoing apoptosis or necrosis and recognised particular receptor that appear on the surface of dying cell. This action will activate complement thus initiated inflammatory reaction that attracts neutrophil and monocyte to the site (Bpac. 2005). Besides these infection, CRP level has been shown to be elevated in non-infectious conditions including meconium aspiration, respiratory distress syndrome, fetal hypoxia and intraventricular haemorrhage (Zwaini, 2009).

A study was conducted to determine the CRP value in children in age of 0 to 36 months suspected with bacterial infection. Blood culture is performed and it is the gold standard for diagnosing bacterial infection (Sucilathangam, 2012). However, result for blood culture can only be obtained after 24 to 72 hours after the sampling. So, the doctor may prescribe the broad spectrum antibiotics to the patients based on the signs and clinical symptoms. It is dangerous situation especially to the paediatric patients because it can cause the infection worst. Thus, the other tests are request to detect the bacterial infection are white blood cell (WBC) count and absolute neutrophil count ANC (Pratt A, 2007). CRP level can elevated in many diseased and condition such as cardiovascular diseases, inflammation, infection and many more. In addition, CRP level cannot affected by the conditions of pregnancy, anaemia and plasma protein variations (Bpac, 2005).