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C-Reactive Protein And Procalcitonin As Biomarker Of Sepsis After Congenital Heart Surgery

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Abstract

Purpose: To study the trend and usefulness of CRP and PCT after CHS to diagnose infection in children below 6 months of age.

Background: After congenital heart surgery (CHS), Cardiopulmonary bypass (CPB), Delayed sternal closure and Low cardiac output due to ventricular dysfunction in immediate post operatively period can cause systemic inflammatory response syndrome (SIRS) which is difficult to differentiate from proven post operative infection.C – Reactive Protein (CRP) and Procalcitonin (PCT) are potential early biomarkers not only diagnose sepsis but also guide the need for empirical antibiotic therapy and duration of antibiotics.

Materials and Methods: In this Single-center retrospective observational study, medical records of 99 patients (65 male and 34 female) with age range of 0-6 months admitted in our center between January 2017 to July 2017 were reviewed. Children above 6 months of age and pre-operative culture proven infection were excluded. In PCICU, along with relevant surgical details, duration of mechanical ventilation and up gradation of antibiotics were noted.CRP and PCT levels were recorded preoperatively and on post-operative day(POD) 1,3 & 5, along with other necessary investigations to diagnose infection. After assimilation of data, the infected and non-infected groups were compared with respect to trend of CRP and PCT level. Receiver operating characteristic (ROC) curve was used to arrive the cut off level of CRP, Procalitonin(PCT). We have also studied the sensitivity and specificity of them along with their co-relation with duration of mechanical ventilation and total days of PCICU stay.

Results : In our study, incidence of infection in younger children is significantly higher than older children; P= 0.048. Incidence of infection with open sternum(22.58%) were higher than that of closed sternum cases(10.29%).The median CRP for the Infected group on POD 3(11.96±5.68mg/dl) and POD 5 (7.02± 6.76mg/dl) were significantly higher than that of non-infected group (POD 3;8.61±4.76mg/dl & POD5;3.59±2.43mg/dl); P = 0.02 ; P=0.01. The median PCT for the Infected group on POD 3 (16.10 ±14.83 ng/ml) and POD 5(5.19±6.99 ng/ml) were higher than that of non-infected group (POD 3; 5.31±9.37 ng/ml & POD 5; 1.39±3.12 ng/ml); P= <0.001, P=0.001.

The PCT level that yielded the best compromise between the sensitivity 92.5 % on POD 3 with cut off 2 ng/ml with an area under the ROC curve of 0.79 and 61.5% sensitivity on POD 5 with cut off 1ng/ml with area under the ROC curve of 0.75.Area beneath the ROC curve for CRP and PCT on POD 1, 3, 5 are 0.56, 0.67, 0.64 and 0.59, 0.79, 0.75 respectively.

Conclusion: To conclude, after the 'On Pump' CHS, CRP and Procalcitonin are useful biomarkers to diagnose infection. We also noticed Procalcitonin is more sensitive as compare to CRP and it shows early declines with appropriate usage of antibiotics.

Biography:

Dr Dhaval Darji, has completed his study in Pediatrics in the year 2014 from the international recognized board, New Delhi (Diplomate National Board) . He has finished his fellowship in PICU from India's one of the largest children hospital (Wadia Children Hospital Mumbai). After that he has been trained in pediatric cardiac ICU from one of the top Corporate hospital in Mumbai . He has special love for kids and has specific passion for management of pediatric opd patients as well as pediatric and neonatal critical patients. He has won 1st rank in poster presentation in PCSI 2018. He has done multiple studies e.g. Neonatal hypoglycaemia and it's complication , Role CRP and Procalcitonin as biomarkers after congenital open heart surgery which were about to present in national as well as international journals

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