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A Study Correlating the Presence of Inflammatory Marker "C-Reactive Protein" in Fracture Patients

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ABSTRACT

Objectives: The present study has been conducted to establish a relation between patient with fractures having time duration upto two weeks and presence of C-reactive protein in their serum.

Materials and Methods: One hundred and three patients with fractures at different site and different time duration have been studied for the presence of inflammatory marker; C-reactive protein. The protein is detected using qualitative Slide agglutination method.

Result: It has been found that out of one hundred and three patients studied, only 43.68% showed positive result and 56.31% were found negative for C-reactive protein in their serum.

Conclusion: There is a poor co-relation between presence of C-reactive protein and fracture. This shows that it is not necessary that every patient with fracture will be having raised CRP level in their serum.

Key Words: Inflammatory markers, C-reactive protein, Fracture, Agglutination

INTRODUCTION

It was Tillet and Francis in 1930 established that C-reactive protein as a marker of sepsis, when they found the capacity to precipitate polysaccharide fraction designated a fraction C, from *streptococcus pneumonia*[1] quickly disappears as patient recovery from the infection. This was not identified in healthy person studied. It was named C-reactive protein, when the reason of this reaction was identified as protein. Since 1930 many other acute phase of inflammatory has been described.

C-reactive protein belongs to the Pentraxin family of protein. The other major member of this family is serum amyloid P component. These protein passes on from generations and during vertebrate evolution, indicating CRP has main role in the immune response.[2] As with many acute phase protein CRP is mainly synthesized by the liver, predominantly in response to interleukin 6 (IL-6).[3] The secretion of CRP begins within 4-6 h. of stimulus and persist as long as the stimulus is present.[4] In addition to the infection there are several other conditions that increases the synthesis of CRP are trauma, surgery, burns, tissue necrosis, etc.

The serum concentration of CRP in the normal human being is below 10mg./L in 99% of normal human population. Level above this value is considered abnormal. Abnormal value indicates the presence of inflammation or disease process. CRP has many different functions; in conjunction with the complement component, CRP is the only acute phase protein that is directly involved in the clearing of micro-organisms. It stimulates cell mediated cytotoxicity.[5,6] It also bind to the nuclear ribonucleoprotein, that shows a direct role of CRP in removal of nectrotic tissues[7].

There are various methods for identifying CRP in human one is qualitative while others are quantitative method. Several quantitative immunological methods has been developed for measuring C-reactive protein are: enzyme immunoassay, immunoturbidimetry and nephelometry.[8,9] Nephelometry meth-

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od is widely used because of its low cost and sensitivity that is within 0.04 mg/ L.[10]

MATERIALS AND METHODS

This study was conducted over a period of six months peroid from January 2019 to July 2019. One hundred and three patients were studied after their prior informed consent taken and permission from ethical committee given. All patients with fractures, at different sites has been studied for the presence of inflammatory marker; C-reactive protein. Those patients with duration of fracture upto two weeks have been included in this study. Out of one hundred and three patients seventy six were male and twenty seven were female. The age group of patients were between nine years to eighty years.

The blood sample, 5-10 ml venous blood of the admitted patients were collected in sterile serum separating tubes without anticoagulant in the morning hours. No special preparation of patient is required prior to the collection of the sample. The test is conducted using "CRP C-Reactive Protein Latex Test Kit".[11,12] This diagnostic reagent kit is used for invitro detection of CRP in human serum by qualitative rapid Latex Slide Tests that is positive only when the CRP level is greater than 06 µg/mL.[13] All the test has been done in the department of pathology, SSIMS.

KIT CONTENTS

REAGENTS

Reagent 1: CRP Latex Reagent

Reagent 2: Positive Control Serum

Reagent 3: Negative Control Serum

ACCESSORIES

Glass Slide

Disposable Applicator Sticks

Disposable Plastic Droppers

Rubber Teats

RESULT

In my study out of 103 patients, it has been found that only 45 (43.68%) showed positive result and 58 (56.31%) were found negative for C-reactive protein. Out of 27 female,11(10.67%) were positive for CRP and 14 (13.59%) were negative. Whereas out of 76 male, 34 (44.73%) were positive and 42(55.26%) were negative.

DISCUSSION

It has been reported that C- reactive protein is elevated till the stimulus is present.[14,15] In present series, irrespective of patient age (youngest patient 09 year male and eldest one 80 years male) and fracture duration upto two weeks, no correlation was established between fracture and presence of CRP in patient's serum inspite of continuous stimulus created by the fracture. In fact there were 56.31% of them who had negative CRP in their serum. There are many other inflammatory marker those are base excess(BE), prothombin time(PT), procalcitonin(PCT), Lipopolysaccharides-binding protein(LBP) and many other marker that are released in blood after trauma. There is no single marker that can decide the outcome in polytrauma patients.[16] It has been noticed that in the first 24hr of insult ESR may be normal but CRP remains elevated.[17]

CONCLUSION

There is a poor co-relation between presence C-reactive protein and fracture. Only 43.68% showed the presence of C-reactive protein and 56.31% showed negative result. The presence of CRP does not help to make a diagnosis of visible fractures and invisible fracture on X-rays irrespective of age, gender or fracture duration.CRP levels in serum appears to be a nonspecific phenomenon but the change can be used to monitor the course of certain disease and their treatment and not for fracture diagnosis.

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