

CRP Levels in Patients Attending a Tertiary Care Hospital.

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ABSTRACT

Background: It is an acute phase protein, which rises due to inflammation, infection and injury. It is synthesized by liver in response to IL-6 secreted by activated macrophages and T cells in acute and chronic inflammatory conditions. Changes in serum CRP concentration occur more quickly than ESR and therefore CRP may be a better reflection of current inflammation. **Methods:** Blood was collected by vene-puncture from the patients and separated sera were obtained from individuals elderly as well as young person's were tested by quantitative & qualitative method. **Results:** In our study, two groups were included in this study, i.e. elderly group & young group. 108 & 40 total cases were included in elderly group & young group respectively. In the elderly group out of 108 cases 35.2% were positive rest were negative for C - reactive protein as well as in young group 35% positive & 65% were negative found in the present study. **Conclusion:** In cases of joint pains CRP tests can give a better picture before going for higher and more expensive investigations.

Keywords: CRP, Infection, Depression, Inflammation, IL-6.

INTRODUCTION

CRP is an acute phase protein. Inflammation, infection and injury are the main cause of its rises.^[1] In acute and chronic inflammatory conditions, it is produced by liver in response to IL-6. IL-6 is secreted by activated macrophages and T cells. Due to changes in serum CRP concentration rise more rapidly than ESR. Therefore, CRP is a better marker of acute inflammation.^[2] The increased risk of infection that happens with ageing is probably related to impairment of local and systemic defence mechanisms. Worldwide, in elderly people, investigation of immune function has revealed defects in both cell-mediated and humoral immunity.^[3,4] It contributes to an increased susceptibility to influenza, bacterial pneumonia, herpes zoster, tuberculosis, cancer, and lymphoproliferative disorders.^[5] The inflammatory response and elaboration of polypeptide mediators of inflammatory processes, has not been as thoroughly studied as immune system. It has been clinically

observed that reduced febrile response to infection in elderly subjects is the possibility of abnormal inflammatory responses.^[6,7] The critical-phase response, a systemic response to tissue injury or infection characterized by alteration in the synthesis and secretion of plasma proteins by hepatocytes are the main accompaniments of inflammatory processes. Both in the development of insulin resistance and metabolic syndrome, inflammation plays an important role. For screening, monitoring the natural history of the disease, and measuring the response to therapeutic interventions, it is better to develop a robust biomarker that can predict metabolic syndrome instead of examining individual variable features.^[8] Several researches revealed that high concentrations of high sensitivity C-reactive protein (hs-CRP), a proinflammatory cytokine is related with insulin resistance and metabolic syndrome. It may predict beginning of diabetes mellitus and cardiovascular events. It has been suggested to include hs- CRP as one of the major diagnostic criteria for metabolic syndrome.^[9]

It is well known that atherosclerosis starts early in life and the cardiovascular risk factors in childhood track into adulthood. It can lead to CVD in future.^[10,11] CRP is an inflammatory marker. It is produced by hepatocytes which are under transcriptional control by the pro-inflammatory cytokine interleukin 6 (IL-6) (Pepys & Hirschfield,

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2003).^[12] The neuroendocrine system which consists of Hypothalamic-Pituitary-Adrenal [HPA] axis is strongly affected by the inflammatory cytokines. It also affects the CNS where many symptoms of illness like fever, decreased appetite, withdrawn behavior, and sleep changes can be produced;^[13] Depression is also related with activation of the inflammatory response.^[14,15] The various inflammatory cascade mechanisms have given new insights and provided several markers. C-reactive protein (CRP) is one the best marker among them.^[16]

MATERIALS AND METHODS

Study population

Two group were included in this study. 108 cases were involved in elderly group & 40 cases were involved in young group.

Study Area

The group study was carried out in the Department of Microbiology of TSM Medical College & Hospital, Lucknow.

Study Duration

Duration of this study was six month.

Data collection

Blood was collected by vene-puncture from the patients and separated sera were obtained from

individuals elderly as well as young person's.^[17] Were tested with quantitative & qualitative method.

Qualitative Method

SERO CHEK AGAPPE kit used.

Quantitative Method

It was done by NEPLOMETRY.

RESULTS

Table 1: Distribution of cases according to gender.

Gender	Elderly Cases	Percentage	Young Cases	Percentage
Male	86	79.6%	23	57.5%
Female	22	20.3%	17	42.5%
Total	108	100%	40	100%

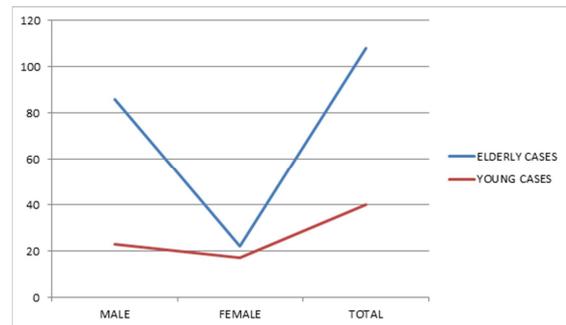


Figure 1: This chart showed distribution of cases according to gender.

Table 2: Distribution of cases according to age

Age	Elderly Cases	Percentage	Age	Young cases	Percentage
60-65	73	67.5%	21-30	6	15%
66-70	22	20.3%	31-40	9	22.5%
71-75	9	8.4%	41-50	13	32.5%
76-80	4	3.7%	51-60	12	30%
Total	108	100%	Total	40	100%

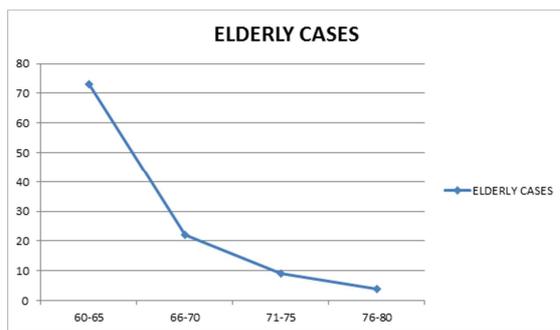


Figure 2: This chart showed distribution of elderly cases according to age

In our study, two groups were included in this study, i.e. elderly group & young group. 108 & 40 total cases were included in elderly group & young group respectively. Among the 108 total cases 79.6% were male & 20.3% were female in elderly group. But in case of young group there were 57.5% male & 42.5% female. In this study we found that 60-65 (67.5%) age group most commonly occur followed by 66-70(20.3%), 71-75(8.4%), 76-80(4%) in elderly group as well as in young group 41-50 (32.5%) age

group cases most commonly occur followed by 31-40(22.5%), 21-30(15%), 51-60(30%). In the elderly group out of 108 cases 35.2% were positive rest were negative for C - reactive protein as well as in young group 35% positive & 65% were negative found in the present study.

A concentration equal to or greater than 6 mg/ml indicates positive whereas concentration lower than 6mg/ml indicates negative results.

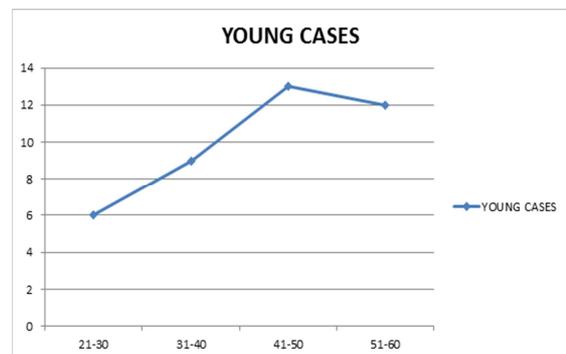
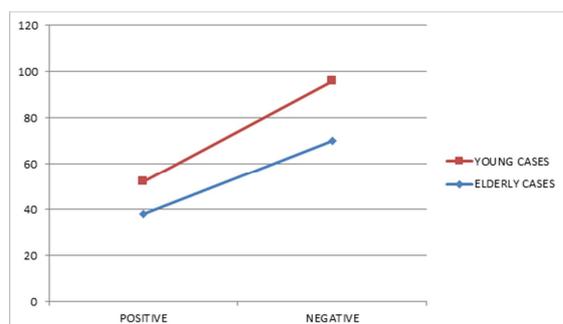


Figure 3: This chart showed distribution of young cases according to age

Table 3: Positive c- reactive protein in all cases

CRP	Elderly cases	Percentage	Young cases	Percentage
Positive	38	35.2%	14	35%
Negative	70	64.8%	26	65%
Total	108	100%	40	100%

**Figure 4: This chart showed positive & negative c-reactive protein in all cases**

DISCUSSION

The present study consists of two groups. These were elderly group and young group. Sample size of the present study was total 148. The total cases were included in elderly group & young group was 108 and 40 respectively. In elderly group, 79.6% were male & 20.3% were female out of 108 cases. In young group, there were only 57.5% male & 42.5% female. In our study we found that in elderly group, 60-65 (67.5%) age group most commonly occur followed by 66-70(20.3%),71-75(8.4%),76-80(4%). In young group 41-50 (32.5%) age group cases most commonly occur followed by 31-40(22.5%),21-30(15%),51-60(30%). For C - reactive protein, out of 108 cases 35.2% were positive rest were negative in elderly group and in young group 35% positive & 65% were negative.

Stanley P. et al also studied elderly and young patients. The results of his study also support the hypothesis that with ageing in humans, both quantitative and qualitative alterations of acute-phase protein production occur., In a group of 131 healthy elderly persons, the median concentration of the major human acute-phase protein, CRP was greater (3.0/ig/ml) than in 47 younger individuals (0.9/ig/ml). In non-parametric statistical testing, the distribution of CRP concentrations differed significantly. Previous studies on CRP concentrations in sera of healthy young adults aged <63 years have disclosed median CRP amounts of 0.6-0.8/ig/ml concentrations which is similar to our young subjects, but less than the older group.^[18-20]

CRP test is cheap, consistent, reproducible and is easily available in most of the hospital. Some researchers also prefer CRP to other markers such as PCT. It very much reliable in sepsis diagnosis.^[21,22]

Does the utilization of a marker make any difference to the patient? It has been studied that the period in which CRP measurement was routinely performed

was compared retrospectively with a preceding period of the same duration, involving 144 and 187 patients respectively. Though the results were not statistically significant, yet the routine determination of CRP was related to the low rate mortality and morbidity.^[23] Though, this finding needs further validation.

CONCLUSION

In conclusion, serial CRP measurement, rather than a single determination at the time of admission, is a simple and valuable instrument in the diagnosis of sepsis and infection as well as in monitoring the response to therapy.

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