

Letter to Editor

## High Sensitivity C-Reactive Protein does not Correlate with IL-6 in Patients with Chronic Kidney Disease

Neha Garg, Mrinalini Kotru, Anil Yadav, Meera Sikka and Om Parkash Kalra

University College of Medical Sciences & Guru Teg Bahadur Hospital, Dilshad Garden, New Delhi -110095

Sir,

High Sensitivity C-Reactive Protein (hsCRP) is an acute phase reactant synthesized primarily by liver after stimulation by various cytokines including IL-6 (Interleukin-6). Hence, levels are elevated in various inflammatory diseases, including CKD (chronic kidney disease) especially in patients on hemodialysis [1]. IL-6 is a 26 kDa protein produced by the Kupffer cells of liver in response to inflammation. Its expression is regulated at gene expression level by interleukin-1 and tumor necrosis factor- $\alpha$ . Its levels are found to be elevated in CKD patients due to decreased clearance as well as increased production [2]. It is a strong inducer of CRP both in vitro and in vivo and its serum levels closely reflect CRP levels<sup>2</sup>. Hence, hsCRP and IL-6 are strongly correlated in most of the clinical conditions.

In our study of 77 clinically diagnosed patients with CKD (Stage 3, 4 and 5) no correlation was seen between hsCRP and IL-6. The mean age ( $\pm$ SD) of patients with CKD was 49.6 ( $\pm$ 14.0) years. The mean duration ( $\pm$ SD) of CKD was 20.6 ( $\pm$ 18) months.

The inflammatory parameters analyzed in this study were ESR (Erythrocyte Sedimentation Rate), hsCRP and IL-6 as shown in Table 1.

**Table 1.** Inflammatory parameters in CKD patients (n=77)

Parameter	Mean $\pm$ SD	Range
hsCRP (mg/L)	63.78 $\pm$ 84.26	1.0-254.0
IL-6 (pg/mL)	33.80 $\pm$ 32.30	3.5-145.0
ESR (mm in 1 <sup>st</sup> hr)	74.86 $\pm$ 39.24	5.0-160.0

hsCRP-High sensitivity C-reactive protein; IL-6-Interleukin-6; ESR-Erythrocyte Sedimentation Rate

All the patients had elevated IL-6 (normal <2.97 mg/L). HsCRP was also increased [63.78 ( $\pm$ 84.26) mg/L], however, 20.07% (17/77) patients had normal hsCRP (<6 mg/L). ESR was high in majority (96.1%, 74/77) of patients. A positive correlation was seen between hsCRP and ESR ( $r=0.493$ ,  $p=0.000$ ). However, no correlation of IL-6 was seen with hsCRP ( $r=0.157$ ,  $p=0.172$ ) or ESR ( $r=0.167$ ,  $p=0.147$ ). This is in contrast to various studies which show a positive correlation between hsCRP and IL-6 as

IL-6 is a known inducer of hsCRP [3]. In contrast, Enocsson *et al.* in their study demonstrated that hsCRP levels do not correlate with IL-6 levels in lupus nephritis patients [4]. They explained this on the basis of activation of type 1 IFN (Interferon) system which inhibits IL-6 mediated hsCRP induction or due to hsCRP polymorphism. However, our study group was heterogeneous with hypertension and diabetes mellitus being the most common etiological factors for CKD and only 3.8% (3/77) patients with lupus nephritis. However still, the factors explained by Enocsson might have existed in our study group, too. Polymorphisms hsCRP are being increasingly studied in CKD patients and could be a contributing reason for the lack of correlation between IL6 and hsCRP [5].

Additionally, CKD patients may have numerous other factors which contribute to inflammation causing different expression of various proinflammatory cytokines. To conclude, in the present study, levels of IL-6 did not correlate with hsCRP reflecting that factors other than IL-6 were governing the levels of hsCRP in our study group. These findings need validation in larger studies.

*Conflict of interest statement.* None declared.

### References

1. Lech M, Rommele C, Anders H-J. Pentraxins in nephrology: C-reactive protein, serum amyloid P and pentraxin-3. *Nephrol Dial Transplant Off Publ Eur Dial Transpl Assoc-Eur Ren Assoc* 2013; 28(4): 803-811.
2. Ataie-Kachoeie P, Pourgholami MH, Richardson DR, Morris DL. Gene of the month: Interleukin 6 (IL-6). *J Clin Pathol* 2014; 67(11): 932-937.
3. Jairam A, Das R, Aggarwal PK, *et al.* Iron status, inflammation and hepcidin in ESRD patients: The confounding role of intravenous iron therapy. *Indian J Nephrol* 2010; 20(3): 125-131.
4. Enocsson H, Sjowall C, Kastbom A, *et al.* Association of serum C-reactive protein levels with lupus disease activity in the absence of measurable interferon- $\alpha$  and a C-reactive protein gene variant. *Arthritis Rheumatol* 2014; 66(6): 1568-1573.
5. Hung AM, Ikizler TA, Griffin MR, *et al.* CRP polymorphisms and chronic kidney disease in the third national health and nutrition examination survey. *BMC Med Genet* 2011; 12: 65.