The various iron parameters and hepcidin for

The kidney is the major route ofhepcidin clearance but in early stage of CKD eGFR does not affect hepcidinlevel and similarly was observed in our study i.

but in somestudies hepcidin was correlated with eGFR ii, iii. In the study of Uehata T et al. they found no significant difference in earlystage of CKD but significant difference in stage 4 and 5 of CKD iv.

However serum TIBC, serum ferritin and hsCRP showed significant correlationwith the eGFR suggestive of subclinical inflammation/uremic toxins (Table1). AbrahamG et al vfound inverse correlation between hsCRP and eGFR but in some studies norelation had been found vi. This study searched for factors like various ironparameters and hepcidin for better predictor of anaemia in early CKD patients. Studiesin India on anemia in CKD identified iron deficiency as a major problem vii, viii. Iron deficiency is common in the Indian population, with prevalence of anemiabeing 33–98% ix, x.

In addition to true iron deficiency, many CKDpatients have functional iron deficiency. These patients have low serumtransferrin saturation (a measure of circulating iron) and normal or high serumferritin (a marker of body iron stores)xi. We found that despite of increasedTSAT and adequate iron store, with increasing stage of CKD patients, there wassignificant reduction of Hb level. This decreased Hb level could be attributedto reticuloendothelial cell iron blockage due to inflammation. Inflammation has beenimplicated in many complications in CKD, including malnutrition, atherosclerosis and decrease iron utilization. Several studies also suggest above findings xii. Decreased Hb was significantly associated with S.

TIBC, hsCRP, ferritinand eGFR (Uremic toxin), which are suggestive of chronic inflammation and alsosupported by other studies xiii, 26. Anemia guidelines for CKD patients consider that TSAT and ferritin areimportant markers of anemia in CKD, and iron replacement is based according toTSAT and ferritin serum levels xiv. Hepcidinlowers the available serum iron levels by limiting iron efflux from the body’siron stores xv; therefore, it isplausible that iron should be sequestrated in iron stores as the serum hepcidinlevel increases. This may cause bone marrow iron deficiency despite sufficientiron in storage sites xvi, suggesting that sufficient serum levels of TSAT and ferritin may not guaranteesufficient production of RBC when the serum hepcidin level is increased. Fourmechanism play role in determining the value of hepcidin i. e.

regulationby iron status, hypoxia, inflammation and erythropoietic signalsxvii. Previous studies on hepcidinlevels revealed a strong positive correlation between serum hepcidin and ferritinconcentrations in CKD patients. The serum hepcidin levels in CKD patients havealso been shown to be associated with iron-restricted erythropoiesis, asreflected by the relation of high serum hepcidin levels and low hemoglobinconcentrations and/or reticulocyte counts xviii, xix. In our study we also found correlation between log hepcidin and log ferritinbut not with hepcidin and hemoglobin. Other studies also suggest that hepcidinis not correlated to anaemia in early stage of CKD where Hb was greater than 10gm/dl but in later stage of CKD, hepcidin correlated with anaemia better thanTSAT and ferritin 26. Although serum hepcidin levelsare correlated with iron status, they have a high short-term intrapatient coefficientof variation and are influenced by inflammation xx.

In our study Hb decreases significantly with decreasedGFR. Hb varied significantly with S. TIBC, S. Ferritin and hsCRP. However Hbwas not affected significantly with serum hepcidin. With Serum hepcidin, our results are consistentwith the results of other studies in dialysis patients xxi, xxiiand consistent with studies in non-dialysis CKD patients 26, xxiiibut not consistent with other studies xxiv. These conflicting results may be attributed to difference in iron status of thepopulation studied, difference in inflammatory state or sample size.

CRP has a relatively longhalf-life of 18 to 20 hours, owing to its stable pentraxin structure. Inaddition, CRP levels are stable as these do not exhibit diurnal variations orvariations in relation to food intake. High-sensitivity enzyme-linkedimmunosorbent assay (ELISA) can detect CRP with a sensitivity range of 0. 01 to10 mg/? l xxv. These high-sensitivity assays help quantify low grades of systemicinflammation, in the absence of overt systemic inflammatory or immunologicdisorders. The hsCRP assays have been standardized xxvi.

The hsCRP is widely evaluated biomarker in the srearch for an ideal biomarkerfor global cardiovascular disease (CVD) risk prediction. It has been used intothe various Risk Scoring system for global CVD risk prediction xxvii. On the basis of data obtained from population based studies, the AHA/CDC(American Heart Association/Centres for Disease Control) Working Group onmarkers of inflammation in CVD has classified serum hsCRP levels <1, 1–3 and> 3 mg/l as low-, intermediate-, and high-risk groups for global CVD, respectively. In our study we found universally high hsCRP level in early stage of chronickidney disease as 80% patients in our study were diabetic.

On dividing patientsin four quartile based on hepcidin level we found significant correlationbetween hsCRP and hepcidin in fourthquartile(Q4: the highest quartile), hence high level of hepcidin could bemarker of poor CVD outcome 39.

Based on iron level we classified the patientgroups into functional iron deficiency group, absolute iron deficiency groupand normal iron level. We observed that established markers of inflammation -CRP, ferritin was higher and negative marker of inflammation – transferrin andalbumin were lower in functional iron deficiency group and other study alsosuggest the same xxviii, xxix. In our study patients with functional iron deficiency, when compared topatients with absolute iron deficiency or normal iron level had significantlyhigh level of hepcidin along with hsCRP which suggest the role of inflammationin regulation of hepcidin and consistent with other studies xxx.