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Efficacy of Oral Roxadustat on Improving Hb and Iron Metabolism in Chronic Kidney Disease (CKD): An Update Meta Analysis

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Objectives: Anemia is complication of Chronic Kidney Disease (CKD) and is associated with significant morbidity and mortality. Current treatment of anemia in CKD patients used recombinant human erythtropoietin or its analogs (erythropoiesis-stimulating agent or ESAs). However, there is safety concerns of high dose ESAs. Roxadustat (FG-4592) is an oral inhibitor of hypoxia-inducible factor (HIF) prolyl hydroxylase that stimulates erythropoiesis and regulates iron metabolism and provides an alternative therapy for anemia in CKD patients. We conducted meta analysis to know the efficacy of oral roxadustat on improving Hb and Iron metabolism in CKD patients.

Methods: Literature search was conducted using google scholar, PubMed and scopus until February 2020 to find randomized control trial (RCTs), which assessed Roxadustat on anemia in CKD patients with/without dialysis. Treatment effect were considered as Mean difference and standard deviation (SD) change from the baseline. We performed data analysis using RevMan 5.3.

Results: A total of 6 RCTs involving 628 intervention and 275 control participants were included in the meta analysis. Treatment with Roxadustat significantly increased Hb (0.86, 95% CI, 0,73-0,98; P<0,00001, I= 88%) , TIBC (32.53, 95%CI, 23.56–41.51; P<0.00001, I=96%) and decreased hepcidin level (-31.92, 95% CI, 35.02–28.82; P<0.00001, I=39%) both in dialysis and non dialysis CKD patients compared with control. However, decreased in ferritin level only significant in non-dialysis subgroup (-51.10, 95% CI, 60.82–41.39; P<0.00001, I=55%) and there is no significant change of transferrin saturation in both subgroup.

Conclusions: Oral Roxadustat showed efficacy on improving Hb and Iron metabolism in CKD patients both with or without dialysis.

Figure 1. Forrest Plot of Hb and Iron Metabolism with Roxadustat Treatment