DUODENAL IRON AFTER FERRIC CITRATE ADMINISTRATION IN UREMIC RATS

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INTRODUCTION

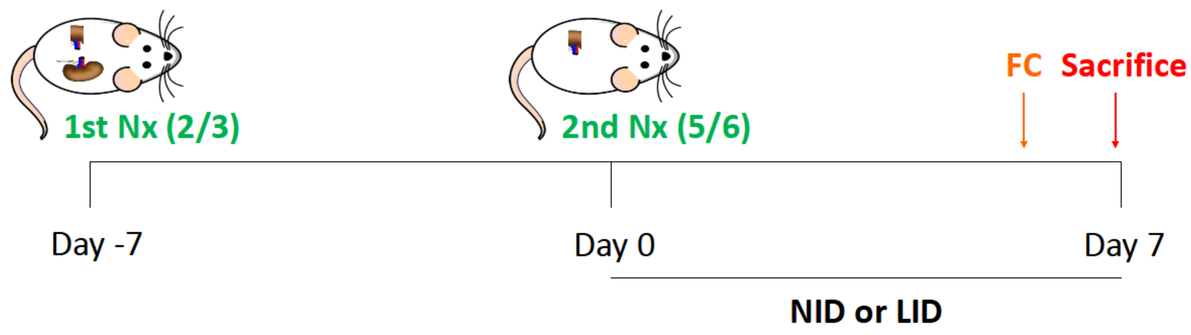
One of the most frequent alterations in patients with chronic kidney disease is the appearance of anemia that requires treatment with agents that stimulate erythropoiesis and iron supplements. Control of phosphate is another difficult task for CKD patients. High phosphate has been associated to mortality and it is the main cause of vascular calcifications.

Ferric citrate (FC) is a new iron-based phosphate binder that has been shown to reduce phosphate absorption and it also increases serum iron levels.

The present study evaluated if FC administration increases intestinal iron absorption at the same time that reduces serum phosphate levels in uremic and anemic rats.

MATERIALS AND METHODS

5/6 nephrectomized rats were fed with normal (NID) or low iron diet (LID) for 7 days. After this time a single oral dose of FC (150 mg/kg body) or water was administered to rats with LID. 2 hours later rats were sacrificed and plasma and duodenal samples were collected. Parameters related to anemia and phosphate were measured.



NID: Normal Iron Diet; **LID:** Low Iron Diet; **FC:** Ferric Citrate

RESULTS

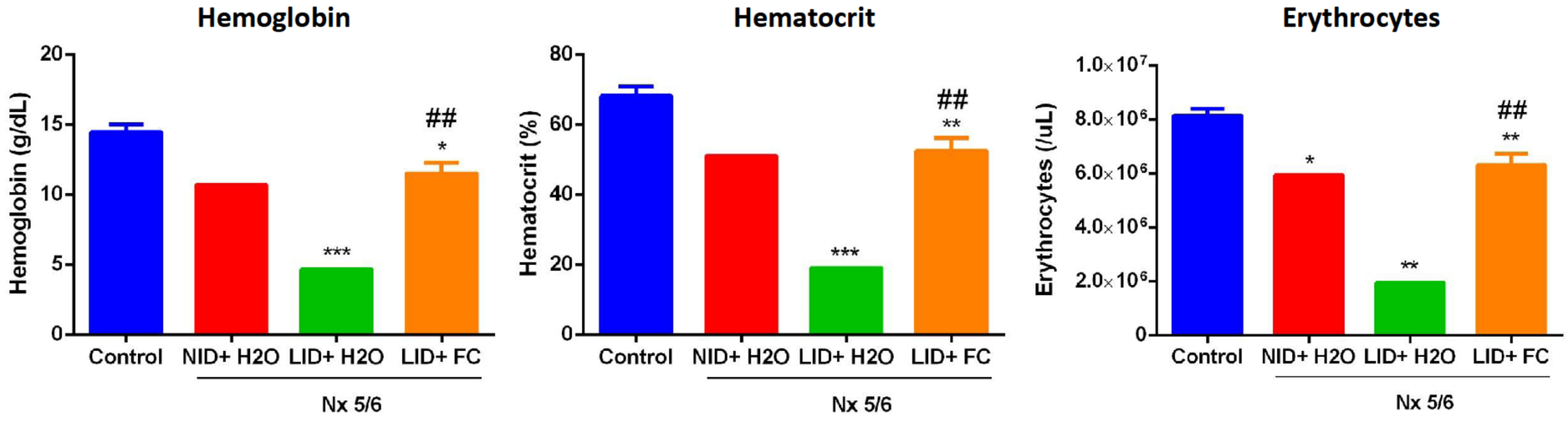


Figure 1. Anemia related parameters after 2 h of treatment. * vs Control Rats; # vs LID + H2O

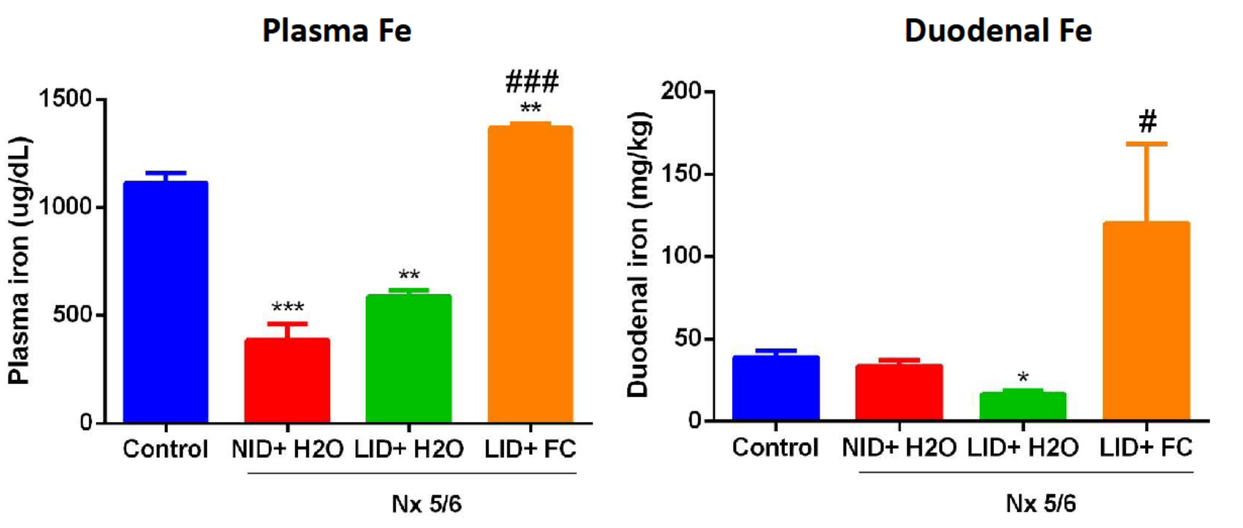
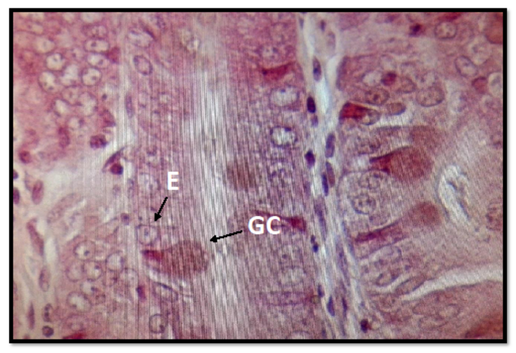
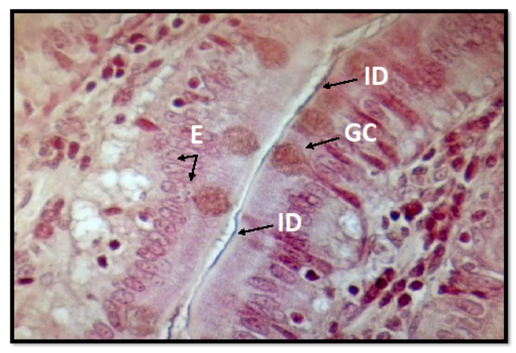


Figure 2. Iron related parameters after 2 h of treatment.
* vs Control Rats; # vs LID + H2O

Figure 3. Phosphate related parameter after 2 h of treatment.
* vs Control Rats; # vs LID + H2O



Nx 5/6 with LID + H2O



Nx 5/6 with LID + FC

Figure 4. Perl´s staining after 2h of treatment.
E: Enterocytes; **GC:** Goblet cells; **ID:** Iron deposits

CONCLUSIONS

In uremic rats a LID induces anemia and hyperphosphatemia. The intra-gastric administration of iron in the form of FC is rapidly absorbed in duodenal portion from intestine improving parameters related to anemia and moreover decreasing the serum phosphate levels. FC could be an effective therapy to combine an increase of intestinal iron and a decrease of serum phosphate.

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