EFFECT OF LANTHANUM CARBONATE ON THE ENDOCRINE FUNCTIONS OF KIDNEY

SUMMARY

If serum phosphorus levels rise above average values, a picture of hyperphosphatemia develops. Phosphate accumulation and hyperphosphatemia in the body cause soft tissue and vascular calcifications. However, phosphate retention increases cardiovascular mortality with conditions such as death and sudden death caused by coronary artery disease. In the etiology of hyperphosphatemia; Although there are various factors such as tumor lysis syndrome, rhabdomyolysis, and hypoparathyroidism, the most common cause of hyperphosphatemia is chronic renal failure. In addition to diet and dialysis, oral phosphate binders are used to treat hyperphosphatemia. Phosphate binders replace anion phosphate with an active cation to form a compound that is excreted from the gut and not absorbed. Many types of phosphate binders do not contain aluminum and calcium, except those based on aluminum and calcium.

Lanthanum, the effect of which was examined within the scope of the study, is a phosphate binder of the Lanthanide class of rare earth elements and not aluminum and calcium-based, used in the treatment of hyperphosphatemia. Lanthanum does not show the side effects of aluminum and calcium-based phosphate binders, and studies have shown that absorption and tissue accumulation are at very low levels. There are studies in the literature examining the tissue, cell and clinical effects of lanthanum accumulation, but these are limited. Studies on the absorption, accumulation, and toxicity of lanthanum have largely focused on the bone, liver, and digestive system. Within the scope of the thesis, the effect of giving different doses of lanthanum carbonate to healthy rats on the relationship between the endocrine functions of the kidney and the hormones involved in the regulation of calcium-phosphorus metabolism was investigated.

In the study, 20 male adult rats were divided into four groups. Oral lanthanum carbonate was administered to three groups at doses of 500 mg/kg, 1000 mg/kg and 2000 mg/kg for 28 days. The rats were bled on the first and last day. Complete blood count from the blood taken, 1,25-dihydroxyvitamin D3, parathormone, erythropoietin, renin, calcitonin, calcium and phosphorus levels were measured. All results were analyzed for statistical significance. In the statistical analysis of the first day and last day blood values of the groups, a significant difference was found in the serum calcium values before and after the administration in the 500 mg/kg and 2000 mg/kg groups.

A significant difference was found in serum PTH, renin and calcitonin levels before and after administration in the 500 mg/kg group. In the comparison between the groups, a significant difference was found in serum calcium levels between the 2000 mg/kg group and the control group after the administration, and in serum phosphorus levels between the 500 mg/kg and 1000 mg/kg groups.

Our results show that lanthanum may be associated with kidney damage. The results of our study should be repeated with larger cohorts and the obtained biochemical and endocrine parameter results should be confirmed with histopathological observations.

Keywords: Lanthanum carbonate, phosphate, phosphate binding agent, kidney endocrine functions.