Estimation of copper zink and magnesium in some renal diseases in children

Ahmed mohamed El Naggar

The deviations from normal health produced by abnormalities in trace mineral metabolism in patients with renal diseases serve the focus for this work. In our study we have evaluated the changes occuring in trace elements (Copper, zinc and magnesium) in some renal diseases. In order to achieve this we have studied 30 patients classified as follow: 10 patients with nephrotic syndrome: 10 patients with acute glomerulonephritis and 10 patients with chronic renal failure. Another 10 normal children were taken as a control. All these children are subjected to through clinical examination and laboratory investigations. In patients with nephrotic syndrome we found that, there were hypocuperemia, hypozincemia and hypomagnesemia. Also, there was a correlation between serum copper, zinc and magnesium and between serum protein and albumin. On the other hand, in patients with acute glomerulonephritis, we found normal serum copper and magnesium while there was a hypozincemia. In patients with chronic renal failure, we found hypercuperemia, hypermagnesemia and hypozincemia. Also, we found a fair correlation between serum copper and serum creatinine, a weak correlation between serum copper and serum urea and a negative good correlation between serum zinc and serum creatinine. There was no correlation betweeen serum zinc and serum urea. In this study we found that the ability of the kidney to maintain a normal plasma copper, zinc and magnesium, in renal disease is affected. This affection of renal homeostasis is correlated to the deterioration of renal function. At the start of the disease, the kidney can maintain the glomerular tubular balance but as the disease advanced disturbed homeostasis develops. Our data document the capacity of the diseased kidney to maintain a normal rate of elemental excretion and the glomerulotubular balance is maintained until far—advanced disease supervenes. It was difficult to ascertain what role these, elemental disturbances play in the symptoms of chronic renal diseases.Serum creatinine is a good sensitive and reliable indicator in renal insufficiency; there was a fair correlation between serum creatinine and Hypozincemia and Hypercuperemia but there was no correlation between serum urea and serum copper and zinc. A significant correlation was present between hypoproteinemia and between both hypozincemia and hypocuperemia, which suggest that zinc and copper deficiency in nephrotic syndrome may be related to urinary zinc and copper losses. In order to prevent some complications in chronic renal diseases, it is very important to regulate levels of trace elements. And so, adequate nutritional treatment is essential to these

patients. This is particulary in patients with chronic renal failure as dialysis does not correct these deficiences. Further studies are needed to define the underling factors responsible for these elemental changes. Studies are also, needed to establish the clinical significance of these abnormalities in chronic renal diseases and role of copper, zinc and magnesium supplementation in the correction of this derangement. The benifit of pharmacologic does of zinc in treatment of manifistations of hypozincemia in chronic renal diseases, requires further evaluation under controlled conditions before the use of zinc routinly for therapeutic purposes. In patients with renal diseases, the causes of abnormal zinc metabolism should be identified.