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Insulin resistance in patients with renal stones (nephrolithiasis) and relationship with citrate ion

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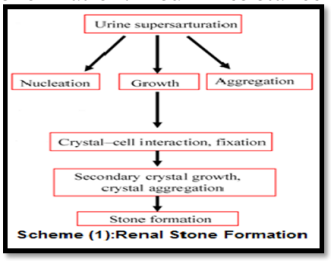
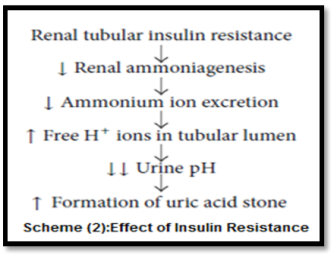
Introduction: Nephrolithiasis (kidney stones) are composed of insoluble salts of constituents of the forming urine. The salts precipitate, and the crystals aggregate and grow and ultimately reach a mass sufficient to cause clinical symptoms. The majority of stones are composed of calcium salts, uric acid, cystine, and magnesium ammonium phosphate (struvite) compose the remainder of the stones. The citrate ion forms complexes with metallic cations. The stability constants for the formation of these complexes are quite large because of the chelate effect so this process prevents renal stones formation. Insulin resistance decreases the production and transport of ammonia, resulting in changes in urine acidification and lowered urine pH leading to increased uric acid excretion resulting in the formation of uric acid stone.



Scheme (1):Renal Stone Formation



Scheme (2):Effect of Insulin Resistance

Aim of the Study: The present study aimed to assess the correlation of the insulin resistance in nephrolithiasis patients in relationship to citrate ion.

Methodology: The present study included (120) human subjects divided into three groups with count (40) subjects for each. Group (A) was the control group while group (B) was induced patients with renal stones only and group (C) was contained patients with renal stones and type 2 diabetes. Ion-exchange chromatography has been used for estimation of citrate ion using special kits. Insulin resistance has been determined by using fasting homeostasis model assessment insulin sensitivity (ISHOMA) which calculated the insulin sensitivity from fasting glucose and insulin levels.

Conclusion: This study concluded that citrate ion decreased in renal stones patients'. The insulin resistance was increased in renal stones patients' when the results compared with that of control group. There were a negative correlation between insulin resistance and citrate ion.

Biography

Karam A Al akkam holds a Bachelor's degree in Pharmacy from the University of Kufa. He has done his Master's degree in Clinical Biochemistry Science in 2016 from the College of Medicine, University of Babylon. He has worked in several hospitals belonging to the Iraqi Health Ministry and has obtained extensive experience in various medical fields for more than 7 years. He participated in many local conferences and workshops which deal with medical and pharmaceutical sciences in Iraq.

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