RISK FACTORS IN URINARY CALCULI

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The formation of stone in urine environment consists of the precipitation as solid phase of poorly solubile salts. This is the basis for a classification of Nephrolithiasis which includes: calcium stones (calcium oxalate and phosphate), uric acid, cystine, infections stones (struvite and carbonato apatite), rare stones (2-8 dihydroxyadenine, xantine, drugs). The corresponding risk factors are peculiar of each type of renal calculi, as listed: Calcium oxalate (Hypercalciuria, Hyperoxaluria, hypocitraturia), Calcium phosphate (Hypercalciuria,hypocitraturia, alkaline pH), Uric acid (Acidic pH, hyperuricosuria), Cystine (Cystinuria), Infection stones (Alkaline pH induced by urease). Stone formation is only possible in supersatured urine with respect to the solid phase, and this condition applies to some but not all type of renal stones (cystine stones, uric acid, struvite). Conversely, in the most frequent calcium nephrolithiasis, it is believed risk derive from an alteration of the ratio between promoters and inhibitors in urines. Main inhibitors are classified into ionic (citrate and magnesium) and macromolecolar (glycosaminoglycans, Tamm-Horsfall glycoprotein, nephrocalcin, etc). In the clinical practice evaluation of risk factors is carried out on urine samples which are analyzed for components of the stones, inhibitors (ionic) and pertinent urine species to be used in the calculation of state of saturation. Therefore, renal stone formation can be viewed as the outcome of systemic metabolic derangements, either primary or secondary to favouring pathologies (i.e. primary hyperparathyroidism). In the last years the role of the kidney has been re-evaluated, emphasizing the interaction between crystals and renal tubular epithelia, mediated by inflammation, oxidative stress, tissue injury. However, these hypotheses do not have any practical utilization.

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