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PATHOPHYSIOLOGICAL ASPECTS OF KIDNEY STONE DISEASE
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The social significance of urolithiasis in recent years, finds a new urgency to the global changes in the health of the world population. Progressive increase in the prevalence of the urolithiasis is obvious, which requires the development of highly efficient methods of prevention and minimally invasive methods of treatment. At the same time the pathogenesis of urolithiasis is not fully understood.

Our aim is to review trends in epidemiology and current concepts for the etiology, pathogenesis and pathophysiology of urinary stone disease.

After reviewing publications, literature and educational materials it has been concluded that there are numerous etiologies. The most common of them are the next: 1) lack of water in the body: stones are mostly found in individuals who drink water less than the recommended 8-10 glasses of water a day; 2) climate and seasonal factors as well inheritance and genetics causes play a role in this disease development; 3) diet: usage of calcium, proteins, carbohydrates,... more than necessary; 4) sex and age; 5) associated diseases; such as: Obesity- Diabetes- Gout- Hypertension: 6) occupational factors: stones have been associated with hot or outdoor occupations: 7) infection: struvite stones form in response to an infection; like urinary tract infection and 8) certain metabolic imbalances.

Urinary stone formation is a result of different mechanisms. In the development of urolithiasis, two pathogenetic pathways are distinguished.

The first theory (crystalloid theory) of development of stones in the genitourinary system is the hypersaturation (supersaturation) of urine with stone-forming components, including calcium, oxalates, salts of uric acid (urates). Crystals, or other foreign bodies, can serve as a nucleus or matrix on which a substance of a microscopic crystalline structure is deposited from a supersaturated urine. This theory is more characteristic for the formation of urate and cystine stones; Calcium stones (especially oxalate stones) have a more complex etiology.

The second theory (colloid-crystalloid theory), is more characteristic for the formation of oxalate stones, consisting of the deposition of cementing material on calcium-phosphate nuclei. Phosphoric acid salts fall on the basement membrane of thin Henley loops, enter the interstitial tissue, and then accumulate in the subepithelial spaces of the renal papillae. Subepithelial deposits of calcium salts ultimately destroy the urothelium of the renal papillae. Cementing matrix, salts of phosphoric and oxalic acids are gradually deposited in the submucosa, forming urinary stones.

Thus, urolithiasis is a complex pathological process involving a whole complex of metabolic disorders, leading to abnormal restructuring of cell membranes with changes in membrane enzymes and phospholipids. Therefore, it is noted that underestimation of these metabolic changes plays a significant role in proper diagnosis, adequate implementation of preventative measures that is accompanied with poor treatment regime and deterioration of patient's quality of life.