

Introduction

Tullio Lotti

Chairman, Club Litiasi Urinaria

Nephrolithiasis is a recurrent condition with significant associated morbidity and economic impact. Although urologic intervention addresses symptomatic stone episodes, prevention of recurrences with proven medical therapy is indicated. Recurrent stone formation in the urinary tract is a common and important problem that must be considered in daily urological practice [1]. Annual incidence of kidney stones is about 0.1–0.4% of the population, and lifetime prevalences in the USA and Europe range between 8 and 15%. Kidney stones occur more frequently with increasing age and among men. Within 10 years, the disease usually recurs in more than 50% of patients [2]. An understanding of the disorder's epidemiology is important to enable effective preventive efforts.

Urolithiasis is a very frequent urological condition, therefore it is mandatory to evaluate the current knowledge for the diagnosis, medical and interventional treatment, and for prophylaxis and metaphylaxis regarding aspects related to urinary tract stones.

It is also essential to have a basic understanding of the etiological factors of stone formation, and careful evaluation of the metabolic and personal risk factors is a fundamental part in the management of patients with urinary tract stone disease. Identification and correction of important abnormalities provide the basis for designing an efficient and rational treatment program, aiming at an arrest or at least a reduction in recurrent stone formation. It is beyond doubt that appropriate therapeutic resolutions in this regard are of great benefit for the patient [3].

About 85% of all kidney stones contain calcium salts (calcium oxalate and/or calcium phosphate) as their main

crystalline components. Because human urine is commonly supersaturated with calcium salts as well as uric acid, crystalluria is very common; in fact healthy people excrete up to ten million microcrystals every day. Recurrent stone formers appear to excrete lower amounts or structurally defective forms of crystallization inhibitors which enables the formation of large crystal aggregates as precursors of stones. Alternatively, crystal adhesion to urothelial surfaces may be enhanced in stone formers. There are two very different categories of stones: (1) non-calcium stones, and (2) calcium stones. These categories will be analyzed in the specific articles.

Urinary lithiasis has a multifactorial origin with participation of physical, chemical and anatomical factors. Physical-chemical factors of renal-prerenal origin are the consequence of exogenous or endogenous agents which are integrated under the name of systemic diseases associated with urinary lithiasis [4]. Study of the physical-chemical factors in patients with renal lithiasis is fundamental as well as the individuation of specific risk factors for stone formation that are grouped under 7 points: (1) onset of disease early in life before 25 years of age; (2) stones containing brushite; (3) strong family history of stone formation; (4) only one functioning kidney; (5) disease associated with stone formation; (6) medication associated with stone formation, and (7) anatomical abnormalities associated with stone formation [5–7].

The recurrent formation of stones in the urinary tract is a well-recognized clinical problem. Unfortunately progress in the medical care of these patients has not paralleled the outcome of surgical care. Since the mid-1980s the management of nephrolithiasis has been revolutionized, not only with regard to the introduction of non-sur-

gical methods such as lithotripsy, but also with improvements in fiber optic technology and laser techniques, which also provide alternative therapies to surgery. Other technologies, such as the use of electrical sparks, have been developed that effectively break up kidney stones.

There are, however, several steps that can be taken to reduce the recurrence rate. In this regard it is desirable to identify patients at risk and to find risk factors that need to be eliminated by recording data on the natural history of the stone. The extent of biochemical evaluation and the

program of stone-preventive treatment in patients with calcium stone formation are presently matters of debate. The clinic diagnosis, treatments for stones in the kidney and urinary tract, prevention with the use of urine and blood chemistry measurements and stone analysis will be specifically treated here in single articles. Also, the important role of the clinical aspect and infection, as well as problems related to the risk of recurrence following ESWL failure, will be extensively examined in this supplement.

References

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