

Guest Editorial

Metabolic stone disease

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The formation of urinary stones is a complex multifactorial process. Physicochemical and biological disturbances play a major role. The incidence of urolithiasis has increased dramatically during the last decades, not only in adults [1], but also in children [2]. Due to climate changes, the incidence will probably rise during the next decades [3].

Nevertheless, urolithiasis is much less common in children when compared to adults. In western countries, only about 2–5% of urinary stone patients are children [4–8]. This may be the reason that many recommendations for diagnosing and treating urolithiasis are derived from adults. In some parts of the world, however, e.g., South Asia, Pakistan and Turkey the numbers are considerably higher [9]. Not only in these regions, but also in countries with a low prevalence of stone disease in children, pediatric urolithiasis is of special interest.

There are several features being different from adult stone disease. Concerning pathophysiology, genetic disorders like cystinuria and primary hyperoxaluria and anomalies of the urinary tract play an important role. Although urinary tract infections as a cause of pediatric stones were much more common in former times [8], infected stones are still more common in children when compared with adults.

The presentation of stones is also somewhat different in children. Due to the pathophysiology of the ureter, in children small calculi may pass unnoticed – a condition being rare in adults.

For diagnostic imaging in renal stone disease, in children there are special rules as they may need repeated examinations during their lives and the cumulated radiation dose may be harmful [10–12].

Therapy and metaphylaxis (secondary prevention) of stones has to be tailored as well to the special needs of children. Although the current non- and minimally-invasive treatment modalities as extracorporeal shock wave lithotripsy (ESWL) and endoscopic procedures as ureterorenoscopy (URS) and percutaneous nephrolithotomy (PCNL) are suitable also for children, some aspects are different from adult use and the differential indications for these modalities are not completely the same.

In order to highlight the importance of renal stone disease in children and to update the state of the art in pediatric urolithiasis, we have compiled a special issue of the Journal of Pediatric Biochemistry comprising all aspects of this disease. International experts share their knowledge with the readers of this journal.

This special issue Metabolic Stone Disease begins with an overview on the Epidemiology of Urolithiasis in Children. Kemal Sarica and Cihangir Cetinel (Istanbul, Turkey) outline current figures and the development of epidemiology during the last decades for the different areas all over the world.

In an article Diagnostic Imaging in Pediatric Urolithiasis Walter Strohmaier (Coburg, Germany) discusses the current state of the art for imaging renal stones in children with special regard to side effects and radiation protection.

The methods for stone removal changed completely during the last decades. Open surgery – at least in industrialized countries – has been abandoned almost completely. Non- and minimally invasive modalities are the gold standard for stone removal today. For

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children, some aspects are different when compared with adults. Thomas Knoll and Gunnar Wendt-Nordahl (Sindelfingen, Germany) outline the current knowledge on Stone Removal in Children.

The next articles analyze the importance of metabolic disorders for stone formation in children. Two common genetic disorders are discussed by Peter Dahlem (Coburg, Germany): Cystinuria and

Heike Hoyer-Kuhn, Bodo B. Beck, Sandra Habbig and Bernd Hoppe (Cologne/Bonn, Germany): Primary Hyperoxaluria – An Update.

A very special type of stones affecting a lot of children in China during the last years is induced by melamine. This substance has been widely used to eke out milk powder.

Although not being the same, nephrocalcinosis widely shares pathophysiology and risk factors with urolithiasis. Predominantly, nephrocalcinosis is seen during infancy. Bernd Hoppe (Bonn, Germany), Nephrocalcinosis in Childhood.

Urolithiasis has a high risk for recurrence. Therefore, it is important to identify metabolic risk factors and to advise measures to avoid recurrences (secondary prevention or metaphylaxis). By this, the risk for recurrence can be decreased to about 10%. As stone disease in children today is mainly of metabolic origin, metaphylaxis plays an important in pediatric urolithiasis.

In the article Metaphylaxis Roswitha Siener (Bonn, Germany) summarizes the current knowledge on secondary prevention with special respect to children and adolescents.

Overall, I think that this special issue Metabolic Stone Disease gives an excellent overview on the current state of the art in pediatric urolithiasis. Although being quite rare, an optimal management of this

disease is crucial to avoid lifelong detrimental consequences in children affected by urinary stones.

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