

CHILDHOOD UROLITHIASIS-“A REVIEW”**Ragini Singh***

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ABSTRACT

Urolithiasis is a very common disease. In children it is very rare condition. Due to various reasons it may occur. Different risk factors such as metabolic, genetic etc. In metabolic several symptoms like hypercalciuria, hyperuricosuria, cystinuria and hyperoxaluria etc. can be seen. Different new therapies such as ESWL(extracorporeal shock wave lithotripsy), PNL(percutaneous nephrolithotomy) and URS(ureterorenoscopy) are there to treat or remove the stone formation, stone size etc in high rate. The main thing is these therapies

or treatment are coming out with well desired results. Different different investigators have done various studies and experiment as well on different volentiors to find the optimum results. **Conclusion:** Urolithiasis is a rare disease in children. But still they should maintain their food and water intake .proper medication should taken by them. It's not so tough to treat. It can easily be treated but prevention is better than cure. So we should protect children and stop urolithiasis to spread among children.

KEYWORDS: Child, Urolithiasis, Risk factors, metabolic, Urinary Tract Infection, Treatment, SWL, Body mass index, different article reviews.

INTRODUCTION

CHILDHOOD urolithiasis is very rare conditions in pediatrics where it may be proper to treat a child simply as a little patient. Though there is an exception of some of the rarer diseases such as melamine stones or furosemide related renal calcifications, in the area of Western countries most of the children suffering with urolithiasis. Findings such as stone composition, stone location and finding metabolic disorder might differ slightly. For example, adults are more drawn to have more ureteral stones than children. However, the kind of stones and kinds of metabolic disorders are sufficiently identical that we can use diagnostic and

treatment modalities from the adult for children in almost the exact same way as we should with adults.^[1]

Pediatric urinary stone disease is a rare pathology with an overall incidence rate of 1–2%, and it is mainly associated due to metabolic abnormalities, genitourinary anomalies and different other factors which can lead to recurrent stone events/episodes. The pathology is mainly associated with morbidity along with reported recurrence rates ranging from 6.5 to 44% and it is found that it appears more in children along with some metabolic abnormalities. Without medical intervention, recurrence rates had been reported to be higher that is 50% within 5 or 6 years. The rate of stone recurrence was seen in previous report that was 4% during a 5-year period. Previously published data have transparently shown that the recurrent stone formation can reveal functional and morphologic changes in the urinary tract indicating the importance of a full evaluation as well as close follow-up of every stone forming child in an individual.^[2-5]

We should keep in mind that all the children suffering from urinary stone disease should be evaluated broadly to find out the possible causes and to plan for the proper management strategies as of the high risk of recurrence. With these efforts, future stone formation and/or growth of an already formed stone may be controlled in an attempt to maintain the morbidity of the disease in this particular population.

Risk factors

Childhood urolithiasis is mainly involved with considerable morbidity and recurrence. There are many risk factors— such as metabolic, genetic, dietary, anatomic and environmental in nature—had been identified in children with urinary tract calculi. As pediatric urolithiasis with a metabolic etiology is the most of the common disease/disorder, determining the metabolic risk factors in subjects is mandatory to treat effectively to both current stones and prevent recurrence.^[6]

Metabolic risk factors such as hypercalciuria, hyperuricosuria, cystinuria and hyperoxaluria

Diagnostic evaluation should target to find out anatomic obstruction, find out the history of the patient (including familial risk factors) and urine analysis.

All the possible therapy should be aimed at the risk factors causing urolithiasis, though therapy should include increasing daily fluid intake.

Urolithiasis has become an important health problem with increasing numbers in children and infants. Identifying the main risk factors for children urolithiasis as early as possible and necessary to avoid the morbidity. Identifying the risk factors for stones should be identified in patients, even if the stones were surgically removed to prevent recurrence, because it is common in pediatric stone formers. At the same time, those patients must be regularly examined, both by pediatric urologists and pediatric nephrologists. On the basis of each patient's metabolic risk factors, different varieties of therapeutic options are available. However, increasing daily fluid intake should be advised for all patients suffering from urolithiasis to prevent recurrence and morbidity.^[7]

Previous studies have shown that Because of the multifactorial causes of stones in children (metabolic, anatomic and/or recurrent UTI), treatment can only be considerable when it is done combination with exact prophylaxis to prevent recurrence. The aims of stone management in children is there should be complete stone clearance, avoidance of stone recurrence and re-growth, preservation of renal function, appropriate management of UTIs, correction of anatomic and metabolic disorders.^[8]

However, the etiologic for urolithiasis in children has been jumped from predominantly infectious to metabolic causes.⁽⁹⁻¹²⁾ Over the past few decades, Studies have been identified metabolic disorders in 33–95% of pediatric patients with urolithiasis, while structurally urinary abnormalities and infection were found in 8–32% and 2–24% of cases, respectively. With this there was the change in genetic abnormalities, drug use, nutritional and environmental factors and all those were reported in a minority of cases.^[13-14]

Hakan Koyuncu • Faruk Yencilek • Sakip Erturhan • Bilal Eryildirim • Kemal Sarica these investigators evaluated the natural course of the stone disease in pediatric/child patients from different perspectives with which the spontaneous passage and stone recurrence rates evaluated. After the study evaluation they concluded that due to the more recurrence and re-growth rates, all pediatric patients with urinary stone disease should be followed carefully with regular visits. They also evaluated that the metabolic risk factors in patients with renal stone/calculi disease might be the basis of medical treatment targeted at preventing recurrent stone events and the growth of pre-existing calculi.^[15]

Paul J. Kokorowski,* Jonathan C. Routh, Katherine C. Hubert, Dionne A. Graham and Caleb P. Nelson investigated that urolithiasis is associated with diabetes mellitus, hypertension and

obesity among children with and without urolithiasis. Among pediatric patients, urolithiasis is mainly associated with higher numbers of obesity, hypertension and lower numbers of type I diabetes mellitus. These findings might be helpful in further finding of the etiology of pediatric urolithiasis.^[16]

Larisa Kovacevic et.al analyzed the abnormalities in children with urolithiasis, and the relationship between diet and hypocitraturia. And they concluded that due to the identifiable metabolic risk factor for urolithiasis, with hypocitraturia became the most common in the urolithiatic children. This differences in metabolic trend might be a significant role to the increasing incidence in pediatric urolithiasis. Hypocitraturia appears to be dietary in origin, it is related with a low consumption of potassium and magnesium.^[17]

Urolithiasis is an endemic disease in our country and has an incidence of 17% in children.^[18] Shock wave lithotripsy (SWL) have become a tool as the preferred treatment for urolithiasis in children with a stone-free rate of 79.9%- 84%.^[19-20] The success of SWL works on different factors, including the stone characteristics (ie, number, size, composition, and location), the type of lithotripter, renal function, and renal anatomy.^[21-22] Complications are relatively minimal and range in severity from hematuria and ecchymosis to obstruction and sepsis. Steinstrasse (SS) is a known complication of SWL. SS is mostly transient, asymptomatic, and passes spontaneously. Results suggested that the stone burden is a significant predictive factor for the development of SS after SWL in pediatric urolithiasis. Most children with SS could be easily and safely treated by repeat SWL.^[23]

Ramazan Altmtaş et.al compared the frequency of usage and success of minium approaches in the management of children urolithiasis in our clinic. And they said that It is important that the chossen therapies are properly planned, and the use of minimally invasive approaches is important in pediatric patients because of potentially high recurrence rates. Currently, ESWL(extracorporeal shock wave lithotripsy), PNL(percutaneous nephrolithotomy) and URS(ureterorenoscopy) are performed with high success rates for the treatment of stones, and open surgery is rarely used due to the success obtained with minimally invasive approaches.^[24]

Hypercalciuria and hypocitraturia are found to be the most important risk factors for urolithiasis. Citrate binds to urinary calcium that forms a soluble complex which reducess the

availability of ionized calcium (Ca^{2+}) which is necessary for calcium oxalate formation and phosphate crystallization.

Tadeusz Porowski, et.al studied the relation of Ca^{2+} fraction with total calciuria, citraturia and urinary pH and to find out whether urinary Ca^{2+} concentration is a fruitful biomarker in metabolic evaluation of children with urolithiasis. They got the result and said that Compared to controls, stone-formers with hypocitraturia showed a higher urinary Ca^{2+} concentration, but it was proportional to calciuria. The large individual variation in urinary Ca^{2+} content limits its main utilization in metabolic evaluation of children with urolithiasis. However, the Ca/Citrate ratio can be a useful clinical tool in evaluating children with urolithiasis.^[25]

Emilie K. Johnson,* Dionne A. Graham, Jeanne S. Chow and Caleb P. Nelson said that Computerized tomography use is highly recommended for children suffering with suspected urolithiasis. The lowest computerized tomography use is in emergency wards that care the more for children. Ultrasound is used infrequently regardless of site. Risks of computerized tomography and alternatives such as ultrasound are warranted in caring for pediatric patients.^[26]

Aysun C,altık Yılmaz, Bahar Bu`yu`kkarago`z, Ural Oguz, Bu`lent C,elik indicated that BMI(body Mass Index) it self could not be assumed as only and definite risk factor for urolithiasis development in children. Although the mechanisms and developing factors for urinary stone formation are well defined in adults, further studies investigating these parameters in children are warranted.^[27]

CONCLUSION

After thorough review of different articles the outcome has come that is child or pediatric urolithiasis is a major problem increasing day by day. To prevent this proper precaution such as daily fluid, water intake, proper urination, proper food should take. To cure this, in already suffering urolithiatic patient different treatments are being discovered day by day. Which is proving very fruitful in their bright future.

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