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On the occasion of world kidney day 2016; renal disease in children

Mohammad-Hossein Fallahzadeh[1*], Mohammad-Amin Fallahzadeh[1]

[1]Nephro-urology Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

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ABSTRACT

Core tip: Renal disease is considered as a significant cause of morbidity and mortality in children. Children should not be regarded as small adults. Renal diseases in children can be different from that of adults in many aspects including the etiologies of chronic kidney diseases that are quite different in different age groups.

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Editorial

Introduction

Renal disease is considered as a significant cause of morbidity and mortality in children. Children should not be regarded as small adults. Renal diseases in children can be different from that of adults in many aspects including the etiologies of chronic kidney diseases that are quite different in different age groups (1,2).

Some hereditary disorders that were previously observed in other family members may be predictable even before pregnancy. By routine ultrasonography that is usually performed during prenatal period, many structural disorders of kidneys and urinary tract can be detectable before birth. Some of these severe disorders may need prenatal intervention and for others, postnatal evaluations and proper management may prevent urinary tract infection (UTI) and renal damage (3).

Maternal renal diseases during pregnancy like diabetes mellitus and also using nephrotoxic drugs by pregnant mothers are other risk factors for renal diseases in the fetus (4,5). Birth asphyxia and prematurity are considered as common perinatal risk factors for renal diseases. Increasing use of nephrotoxic drugs including antibiotics and diuretics in neonatal or pediatric intensive care units is another significant risk factor for kidney damage (6-8). The immature kidneys in early postnatal period are more vulnerable to acute kidney injury (AKI) in the form of acute tubular necrosis, renal vein thrombosis, renal cortical necrosis or hemolytic uremic syndrome especially secondary to hypoxia or dehydration (7,9). Due to high prevalence of infantile diarrheal diseases and dehydration episodes particularly in the developing countries, the aforementioned renal complications are frequently observed in children.

Complicated UTI frequently leads to renal damage, particularly during infancy. Renal damage is more severe and more frequent if acute pyelonephritis is associated with obstructive lesions or high grade of vesicoureteral reflux (10).

Autosomal dominant polycystic kidney disease, considered as a common hereditary renal disease in adults, is less frequently detected in smaller children. On the other hand, autosomal recessive polycystic kidney disease or nephronophthisis are more frequently observed in children (11).

Nephrolithiasis is an increasing renal disease in children in most geographic areas of the world. It can be observed even in the first few months of life. It could be the cause of UTI and may lead to obstructive uropathy. Family history is highly positive in the majority of the patients (12). Infantile type of primary hyperoxaluria as an example of hereditary disease, is a significant cause of renal failure in infancy. It is usually associated with renal stone and/or nephrocalcinosis (13).

Renal tubular acidosis (RTA), either as primary or secondary to some hereditary metabolic disorders, is more frequently observed in smaller children. When presented as fanconi syndrome, it may lead to renal failure as in the case of cystinosis. RTA could present as renal stone and/or nephrocalcinosis (14).

Glomerulonephritis is unusual in infancy; however, different types of the disease could be expected in older children. Acute post-streptococcal glomerulonephritis

*Corresponding author: Prof. Mohammad-Hossein Fallahzadeh,
Email: fallahzh@sums.ac.ir

(APSGN), IgA-nephropathy and henoch-schönlein purpura nephritis are the common causes of acute glomerulonephritis in children (15). Alport syndrome, the most common cause of chronic hereditary glomerulonephritis, usually begins in childhood (16). Among different causes of glomerulonephritis in children, APSGN has the best prognosis (17).

Another large group of glomerular diseases in children is nephrotic syndrome. It can be secondary to different causes including systemic diseases. In contrast with adults, the steroid responsive type known as minimal change disease is the most common form (18). Congenital nephrotic syndrome is usually detected during the first three months of life and is associated with a poor prognosis (18). Another pathology of nephrotic syndrome with poor prognosis is focal segmental glomerulosclerosis. It is occasionally found as a familial disease in children (18).

As an increasing problem in children, obesity is a predisposing factor for hypertension and diabetes mellitus, both considered as potential causes of renal damage (19). Increasing rate of using different nephrotoxic drugs including analgesics, antibiotics, diuretics and calcineurin inhibitors, used in organ transplantation, will significantly increase the risk of kidney damage (20).

Some renal diseases in children and especially in infants may be asymptomatic or present with non-specific symptoms such as failure to thrive, irritability, vomiting and constipation. Different surface anomalies such as single umbilical artery, external ear malformation, periauricular pits and supernumerary nipple may suggest the presence of concomitant congenital renal anomalies. When multiple congenital anomalies are found in an infant, renal and urinary tract anomalies is to be investigated (21).

Considering the different etiologies of kidney damage, a significant number of renal diseases are preventable, especially in AKI. Early detection of renal diseases could have a major role in prevention of end stage kidney disease. Routine check of blood pressure and monitoring growth indices can detect some renal disorders and proper life style can control some risk factors for kidney diseases in children. Renal disease screening in children with urinary dipstick used in some centers, may not be cost-effective; therefore, it is not universally accepted (22-24).

With end-stage kidney disease, renal replacement therapy is mandatory. Unlike what is usually expected in adults, hemodialysis is not always possible in infants and smaller children. For such small children, peritoneal dialysis is the dialysis modality of choice. As the treatment of choice for end stage kidney disease, renal transplantation is not always practical in smaller children. In some special situations, combined kidney and liver transplantation is recommended (25).

Conclusion

In conclusion, renal diseases in children are different from adults in many aspects. Some of these diseases are predictable and the majority are preventable.

Authors' contribution

MHF and MAF wrote the paper equally.

Conflicts of interest

The authors declared no competing interests.

Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by authors.

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