



RESEARCH ARTICLE

PREVALENCE OF KIDNEY DISEASE IN APPARENTLY HEALTHY CHILDREN WITH RISK FACTORS OF HIGH SPECIALTY NAVAL GENERAL HOSPITAL

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ARTICLE INFO

Article History:

Received 29th October, 2017

Received in revised form

25th November, 2017

Accepted 17th December, 2017

Published online 30th January, 2018

Keywords:

Chronic Kidney Disease,
Obesity, Hypertension,
Urinary tract Infection,
Proteinuria, Hematuria.

ABSTRACT

Background: there is little information about the prevalence of kidney disease in early stages, especially focused on pediatric age, this is because the disease is asymptomatic during these stages, a timely diagnosis with strict follow up

Objective: to know the prevalence of kidney disease in apparently healthy children with risk factors.

Methodology: a cross-sectional, descriptive, observational study in children who attended the outpatient clinic of pediatrics identified with risk factor by means of a questionnaire, analysis of the analyzed parameters and laboratory studies to evaluate the renal function, the data obtained were analyzed by means of statistics descriptive to report frequencies, percentages and measures of central tendency (mean and median) and dispersion (range and standard deviation).

Results: 33 patients were studied, 18 of the male gender corresponding to 54. 5% with predominance of patients of school age; 15 women of the female sex with 45. 4%. Of the variables to demonstrate kidney disease, significant proteinuria was found in 6. 1% and hematuria in 21. 2%, this in 11 patients corresponding to 33. 3% of the sample cataloged with evidence of kidney disease at the time of the study.

Conclusion: it is important to implement screening studies in this type of patients with known risk factors for chronic kidney disease, even if they are asymptomatic, since they may present early stages of the disease.

INTRODUCTION

The term chronic kidney disease includes a heterogeneous set of diseases that affect renal structure and function (R. Montañez Bermudez, 2014); Traditionally it is defined as kidney damage for a time equal to or greater than 3 months, with the presence of structural and / or functional abnormalities of the kidney with or without a decrease in the Glomerular Filtration Rate (GFR) and one or more of the following characteristics:

- Alterations in the composition of urine or blood
- Alterations in image tests
- Alterations in renal biopsy, or in patients with a GFR less than 60mL / min / 1. 73m² equal to or greater than 3 months, with or without the other signs previously described. (Mara Medeiros R. M. , 2011)

Epidemiology

Chronic kidney disease is considered an important public health problem, not only nationally but also internationally

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(Ataei N, 2016); unfortunately, in our country there is no national registry of renal patient data neither in adults nor in children (INEGI, 2012); As a consequence, the prevalence of this pathology in Mexico is unknown. The reported global incidence of this disease ranges from 8. 3 to 12. 1 new cases per million (Vazquez, 2014); In developed countries, the proportion of children with chronic kidney disease is approximately 20 to 25%. With this, it can be deduced that there are 3 000 to 6 000 children with this problem in our country. In Mexico Góngora et. In a study conducted in 2008, he reported a prevalence of chronic kidney disease in children of Aguascalientes of 700 cases per 100 000 (Vazquez, 2014); in 2016 at the Children's Hospital of Mexico, 24% of children with a family history of chronic kidney disease, who had urinary disorders and / or kidney disease, were found. (Mara Medeiros R. M. , 2011). Most of the epidemiology of chronic kidney disease comes from statistics in patients in terminal stage, this is because during the early stages this disease is asymptomatic, it is believed that patients in early stages exceed 50 times the terminal stage. (Mara Medeiros G. D. , 2015)

Classification of chronic kidney disease

Traditionally, the K / DOQII1 guidelines classify chronic kidney disease into 5 stages, which are: (KDIGO, 2013)

Stage 1: TFG > 90 ml / min. / 1.73 m²

Stage 2: GFR between 89 and 60 ml / min. / 1.73 m²

Stage 3: TFG between 59 and 30 ml / min. / 1.73 m²

Stage 4: TFG between 29 and 15 ml / min / 1.73 m²

Stage 5: TFG <15 ml / min. / 1.73 m²

However, in the latest updates, a new more complete classification has been included, which includes its etiology, glomerular filtration and albuminuria or proteinuria values, thus defining groups with different risk of progression and appearance of complications; These criteria apply to the pediatric population over 2 years of age. Chronic kidney disease and uraemic state are characterized by the accumulation of substances that are normally excreted or metabolized in the kidney and the lack of those that are synthesized as erythropoietin or calcitriol.

The importance of a timely diagnostic

Unfortunately, chronic kidney disease is asymptomatic during the early stages, which causes a significant delay in its timely diagnosis and in most cases, it occurs when there are symptoms that affect the quality of life, physical, mental and social development of children. In our country, timely detection in risk groups has been implemented by the National Kidney Foundation known as KEEP (by the acronym in English of the Kidney Early Evaluation Program) (Guillermo Cantu, 2012) being the most effective for the timely identification of this disease. However, it only covers a population over 18 years of age. Risk situations that favor the development of kidney disease are multiple; this pathology is of slow and silent progression (Rodriguez, 2015); the risk factors appear in each of their phases and these can be classified as:

- Susceptibility factors: are those that increase the possibility of developing chronic kidney disease
- Initiating factors: are those that can directly initiate kidney damage.
- Progression factors: those that can worsen and accelerate the deterioration of kidney function.
- Final stage factors: are those that increase morbidity and mortality in the final stages of the disease.
- In the pediatric population, the history of prematurity, acute renal failure, urinary tract infections, congenital malformations, diabetes mellitus, obesity, hypertension, among others, are suggested as risk factors.

In Mexico, the prevalence of overweight and childhood obesity is 26% in children from 5 to 11 years old (Sonia B Fernandez Canton, 2011); our country ranks first in childhood obesity. Both children and adults have seen an increase in segmental and focal renal sclerosis associated with obesity (Wei Ding, 2015). The increasing prevalence of overweight goes hand in hand or in parallel with the increase in cases of diabetes mellitus in children and adolescents. Kidney disease caused by any type of diabetes is rare during childhood, however in these years it has been seen that hyperglycemia contributes to the

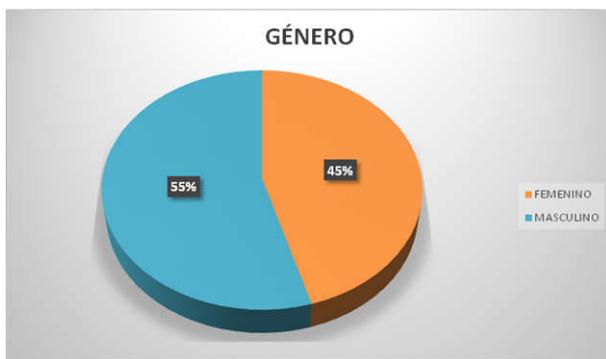
presence of long-term complications. The projection of the glomerular filtration rate, blood pressure and albumin / creatinine ratio should be evaluated at the time of diagnosis of diabetes mellitus in young patients, which justifies an assessment by the nephrologist. The survival of premature babies has increased considerably in the last decades, this due in large part to the advances in the field of intensive care units (J. Bryan Carmody, 2013), however the consequences in the development of these children still They are not entirely clear. Regarding renal function in children with a history of prematurity, it is known that at birth they present a lower number of mature nephrons; Brenner's hypothesis suggests that, as a consequence, these patients develop a hyperfiltration in a compensatory manner that results in sodium retention, hypertension, loss of nephrons and finally development of chronic kidney disease due to secondary glomerulosclerosis (J. Bryan Carmody, 2013). Because the risk of chronic kidney disease in preterm and low birth weight infants has not been accurately determined, there are no evidence-based recommendations for early detection in these patients. A high-risk population is found in first- or second-degree relatives of patients with terminal chronic kidney disease, who are 2 to 3 times more likely to develop the disease. (Mara Medeiros G. D. , 2015). Urinary tract infection (UTI) is one of the most frequent acute diseases and the most common bacterial infections in infants and young children, predominantly in the first three months of life. Its prevalence is 8% in girls and 2% in boys over 7 years old (Vivante A, 2014). The factors involved in the development of kidney damage are: vesicoureteral reflux (VUR), obstruction of the urinary tract, age (there is a greater risk in children under 2 years), the number of episodes of acute pyelonephritis, therapeutic delay, bacterial virulence and individual susceptibility.

MATERIALS AND METHODS

Cross-sectional, descriptive, observational study in children who attended the outpatient clinic of pediatrics identified with some risk factor such as obesity, systemic arterial hypertension, diabetes mellitus, antecedent of prematurity, urinary tract infection of repetition, low weight, short stature; Through a questionnaire, anthropometric indexes (weight, height and body mass index) were taken, as well as laboratory studies to assess renal function (general urinalysis, serum creatinine, urea nitrogen). The data obtained were analyzed by means of descriptive statistics. report frequencies, percentages and measures of central tendency (mean and median) and dispersion (range and standard deviation).

RESULTS

A total of 33 patients with various factors considered risk factors for the development of chronic kidney disease were included in the study, captured through the reference from the outpatient clinic of Pediatrics and naval centers in Mexico City. Of the total sample including 18 patients were male, which corresponds to 54.5% with predominance of school-age patients; 15 were female with 45.4% (graph 1). Table I summarizes the clinical and demographic characteristics of the study sample. Within the sample, obesity was identified as the main risk factor, followed by urinary alterations such as infection or uropathy. It is striking that although only one patient was detected by the diagnosis of HTN initially, after the measurements 4 of them (12.1%) were found compatible



Graph 1. Distribution by gender of the sample studied

Table 1. Demographic and clinical characteristics of children with risk factors for kidney disease (n = 33)

Demographic and clinical characteristics	n (%) o med (p25 – p75)
Sex	
Male	18 (54.5)
age	9 (4.5 – 11)
Initial risk factor identified	
Obesity	13 (39.4)
Urinary infection or uropathy	10 (30.3)
Prematurity	2 (6.1)
Family history of CKD	1 (3)
Systemic Arterial Hypertension	1 (3)
diabetes mellitus type 2	2 (6.1)
Size or low birth weight	4 (12.1)
Antropometría	
Weight (Z value)	0 (-1.99 - 1)
Size (Z value)	-1 (-2.7 - -0.045)
BMI (Z value)	0.7 (-0.47 - 1.67)
TAD	100 (85 – 106)
TAS	60 (60 – 65)

with the diagnosis according to the operational definition. Regarding the biochemical findings for patient classification, the median glomerular filtration rate was 109.6 mL / min / 1.73m²SC (p25 98.8 and p75 120.4), only in one case considering below what was expected for age. with determination of 0.91 of serum creatinine and TFG of 43.1 ml / min / 1.73m²SC. Regarding the determinants identified in urine, significant proteinuria was identified in 6.1% and hematuria in 21.2%. With the above, 11 patients (33.3%) of the sample with evidence of kidney disease at the time of the study were cataloged.

DISCUSSION

The prevalence of chronic kidney disease in early stages was 33.3% in our study population; being greater than the results obtained in a previous study carried out in the Hospital Infantil de México in which it was 24%; however, this may be due to the fact that in this study only patients with a history of relatives with kidney disease were included. The risk factors reported in the literature are consistent with the results obtained in previous studies, with obesity having a greater weight in our study, reflecting what has been observed in recent years regarding the increase in the prevalence of obesity in the pediatric population, since according to ENSANUT 2012 the prevalence of obesity was 26% and in our study 39.4%. Likewise, the increase in body mass index and weight was reflected in renal function; since as reported in the literature children as overweight or obesity tend to have glomerular hyperfiltration data in the early stages of the disease.

On the other hand, these patients are associated with blood pressure values greater than the 95th percentile for age, thus constituting another risk factor for kidney disease.

Conclusion

According to the results obtained in the present study, it is possible to observe the importance of closely monitoring patients with risk factors for the development of chronic kidney disease, making timely assessments in the intentional search for alterations in renal function. Focus on patients with obesity and overweight, is an important measure, especially when observed the alarming increase in this pathology, because as we know, these two risk factors are highly modifiable and subsequent complications can be avoided. Conduct a screening program in all medical facilities of the Mexican Navy for the timely detection of those patients at risk, as well as establish a nephrology clinic for close monitoring of these children. Instruct the population in general to modify their lifestyles, promoting healthy eating, not only at home, but also in schools and in the CENDIS of our institution to reduce obesity and overweight, as a consequence of the decrease in diabetes type 2 and systemic arterial hypertension that are part of the comorbidities that influence the deterioration of renal function. A limitation in our study was the size of the sample and the time of the study, which is why we propose to carry out future research, with a longer time for the capture of patients and thus be included in the nephrology clinic to carry out a study. Register of patients at risk and be able to prevent this disease.

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