CLINICAL-IMAGING STUDY OF CONGENITAL HYDRONEPHROSIS IN THE EARLY POSTNATAL PERIOD

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Abstract

Early diagnosis of congenital hydronephrosis, sometimes even from intrauterine life, may lead to the establishment of a suitable therapeutic course to avoid the occurrence of complications.

Congenital hydroronephrosis, especially bilateral, and it is possible complications, such as recurrent urinary infections, which, in the absence of treatment, may impair renal function such as acute renal failure.

Good ultrasound monitoring of newborns at 24-48 and post-natal and at 3 months allows to improve the quality of life of these children before any possible complication.

In the present paper the authors propose to establish the presence of possible congenital hydronephrosis in a group of newborns admitted to the Neonatology Clinic of Louis Turcanu Hospital during the period 01.01.2016-31.12.2017 and the therapeutic conduct of choice that will lead to the avoidance of possible complications.

Keywords: congenital hydronephrosis, ultrasound, newborn, complications.

Introduction

Congenital hydronephrosis is a special clinical entity in neonatal pathology- representing dilation of the basin and renal calves by preventing urine flow to the bladder with possible consequences for urinary tract infections, renal dysfunction or insufficiency, lithiasis.

The continuing evolution of medicine and access to imaging investigations in pregnancy have allowed the diagnosis of hydronephrosis since the 18th week of gestation which has led to an improvement in the subsequent progression of newborns with congenital hydronephrosis. The antenatal association of the oligohydramnios is suggestive of a possible renal tract obstruction.[1].

Dispensing pregnancies and accessing fetal ultrasound will allow for prenatal diagnosis by measuring the anteroposterior diameter of the renal pelvis (5-10mm between 18-23 gestational weeks).[2].

Once diagnosed, Congenital Hironephrosis is a priority in determining the cause and establishing appropriate therapeutic behaviors, sometimes requiring surgery in some cases.

Good ultrasound monitoring of newborns at 24-48 and post-natal and at 3 months allows to improve the quality of life of these children before any possible complication.[4]

The major challenge is still to differentiate between clinically significant and transient hydronephrosis and to choose the optimal way to manage these cases.[3].

To know whether or not there is hydronephrosis, a pre or postnatal abdominal ultrasound is sufficient.

For the diagnosis of the cause of hydronephrosis, besides ultrasound, some of the following explorations may be needed:

- Urine and blood examinations
- Tomography computer exam
- Urography
- MRI
- Urinary scintigraphy
- Bladder Investigation (cystography)
- Bladder or ureters survey
- Laparoscopic exploration.

Prenatal hydronephrosis

Hydronephrosis - Dilation of the pelvis - is the most common prenatally identified genitourinary abnormality, with an incidence of 1 to 5% of all pregnancies.[1] Prenatal hydronephrosis is an ultrasonographic identification and not a diagnosis itself; in the vast majority of cases, antenatal hydronephrosis is a transitory condition with no clinical significance, and in other cases (12-88%) may be the expression of an associated pathology, generally speaking of upper or lower urinary tract obstruction, or of reflux; in these pathologies, prenatal ultrasound is useful, preventing complications such as urinary tract infections, dysfunction or renal insufficiency[2].

CLASSIFICATION OF HYDROPHENOSIS IN GRADES

Depending on the severity, hydronephrosis is classified in 4 degrees (1, 2, 3, 4) hydrology, which is the increasing order of severity of hydronephrosis (according to the Society of Fetal Urology).

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Degree of prenatal hydronephrosis depending on the anteroposterior diameter of the renal pelvis. Degree of Prenatal Hydronephrosis Second Trimester or Third Trimester [5].

-Light 4 to <7 mm -7 to <9 mm

-Moderated 7 to 10 mm 9 to 15 mm

-Severe> 10 mm> 15 mm

In 1993, the Fetal Urology Society (SFU) introduced a hydronephrosis grading system based on pelvis, calcite, renal parenchyma, a widely accepted system [4].

Small hydronephrosis is also called early hydronephrosis and spontaneously resolves postnatally in 80% of cases [5].

Aim

The authors proposed to analyze the incidence, progression and complications of hydronephrosis as well as the subsequent evolution of renal function.

Material and method

A retrospective study was carried out over a period of 2 years (1.01.2016-31.12.2017), analyzing the observation sheets from the Clinic of Neonatology - Premature of the Emergency Hospital for Children "Louis Ţurcanu" Timişoara, on a batch of 12 patients admitted with the diagnosis of congenital hydronephrosis.

The target population was newborns and hospitalized infants aged between zero and 3 months who were diagnosed with congenital hydronephrosis and where imaging investigations allowed confirmation of the diagnosis.

Determining the cause of congenital hydronephrosis born in the presence of maternal oligoamnios and associated factors (urinary infections during pregnancy).

Results

Congenital hydronephrosis was largely asymptomatic, being prenatally diagnosed in fetal morphology ultrasound - 75% of cases, and 25% were postnatally diagnosed, associating a symptom of urinary tract infection (41.66%).

Initially the batch of patients were investigated imagistically, abdominal ultrasound, which revealed in all cases hydronephrosis of a certain degree.

Cystography is the most important exploration in identifying the morphological and functional data characteristic of each defect in part, and in most cases allowing the correct diagnosis to be made, was carried out in all cases with suspicion of the posterior urethral valve or the pielocaliceal junction stenosis, was required in 6 out of 12 cases, representing 50% of patients admitted to the batch.

In the studied group all 12 were newborns were on term, and 1 case among them, was newborn on term with intrauterine growth restriction.

The gender distribution of the total number of newborns diagnosed with various types of hydronephrosis showed a slight predominance of male gender: 83.33% boys versus 16.66% girls.

Following the imaging investigations (Abdominal Ultrasound, Cystography) it was found that the posterior urethral valve represented 33.33% (4 cases), 50% (6 cases), followed by urinary tract infections 16.66 % (2 cases).

A 25% (3 cases) of hydronephroses associated with vesico-ureteral reflux and 41.66% of cases requiring surgery.

They were also diagnosed and infants with single congenital kidneys accounted for 8.33% (1 case) and 8.33% (1 case) syndrome which also associated congenital heart malformation.

The case associated with heart malformations died, accounting for 8.33% of the study group.

The rest of the cases required corrective surgery to avoid severe complications (acute renal failure, urinary tract infections) that would require prolonged hospitalization with increased human and material consumption.

Discussion

Early identification of cogent hydronephrosis since the antenatal period provides a significant benefit in establishing the subsequent therapeutic course and preventing its possible complications.

The identification of hydronephrosis involves repeated examinations during pregnancy and neonatal evaluation, the sooner the hydronephrosis is important, bilateral, renal mass, urinary tract infection or if there is suspicion of a single kidney [4].

We must keep in mind that many congenital anomalies can also involve kidney damage. That is why the phenotypic aspect with implanted lower ears, associated or not with sexual ambiguity, abdominal wall defects, anal atresia, skeletal abnormalities, myelomeningocele, spina bifida occulta, pneumothorax, pulmonary hypoplasia, hypospadias, cryptorchidism underlie the widening of the base of investigations in the sphere renal [5].

Hydronephrosis with all evolutive stages is commonly found in medical practice many times in the postnatal period, but the forms of disease, evolutive stages are established postnatally, in dynamics, both on clinical data but the most secure on imaging data.

If hydronephrosis is moderate or severe, postnatal assessment should take place immediately after birth but in the case of mild, antenatal hydronephrosis, expected for several days is recommended to allow good hydration and minimize the incidence of false negative results due to oliguria and dehydration specific to the first days of life. [3].

In interpreting an imaging bulletin, we must take into account the functional morpho-functionality of the kidney. In the newborn, the kidney has lobular surface, palpable lower pole, moderate dilatation of the pielo-caliceal system, kidney pyramids have well developed, more pronounced.

Postnatal kidneys replace placenta in the homeostasis of the body. This transition occurs progressively by increasing renal blood flow, glomerular filtration rate and tubular functions.[2]. Taking this into account, the renal

function is improved, which should be correlated with postnatal age and less with gestational age.

A thorough clinical examination of the newborn can detect an abdominal mass in the renal lobe of 0.8%, with one or two-fold identification being very important. The appearance of other clinical signs such as edema, oliguria, or complex malformation context (and renal involvement) can guide the diagnosis to a kidney disorder.

Also, the detailed anamnesis can give us a clue about renal pain in the context of oligoamnios, perinatal asphyxia, coagulation disorders, polycythemia, thrombocytosis, thrombocytopenia, sepsis or maternal drug use.

If the first postnatal ultrasound does not reveal dilatation and the kidney size is normal, the child does not require further investigation and it is recommended that the ultrasound re-evaluate that at one year of age; if the second ultrasound is normal, it is no longer necessary to reassess the child asymptomatic, but if the ultrasound reveals dilatation then it is necessary to perform a urethro-histogram to exclude the vesicoureteral reflux [6].

Depending on the degree of hydronephrosis and lateral or bilateral affection, the subsequent therapeutic course of antibiotic prophylaxis will be decided to prevent recurrent urinary infections until surgical correction of the defect.

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