Vesicoureteral Reflux – Severe Associated Factor of Posterior Urethral Valves in Children

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Introduction: Posterior urethral valves represent a congenital barrier at the level of the posterior urethra, which opposes miction. They are located near the prostatic urethra, originating at the verumontanum level, affecting the male sex. The obstruction determines dilation of the prostatic urethra upstream, hypertrophy of the bladder detrusor which obstructs the urethrobladder junction. The ureters are inconstantly dilated, the vesicoureteral reflux is met in 2/3 cases, half of these being bilateral. The presence of the reflux is interpreted as a severe associated factor. Semiology is pretty unspecific: unremitting fever, sepsis, dehydration syndrome, urinary infections, dysuria, reduction of urinary jet, urinary incontinence, vesical globe, haematuria, ureterohydronephrosis. Positive diagnosis is based on early discovery, antenatally, of the impairment, by fetal echography starting from the 28th week of pregnancy. Postnatal echography followed by miction cytography and retrograde urethrography, creatinine dosage completes the diagnosis. The treatment is surgical: endoscopic ablation of the valves (in the absence of renal failure), percutaneous pyelostomy, high lateral ureterostomy, and in severe cases vesicostomy, renal transplant. Prognosis depends on how early the impairment is detected, on the degree of pulmonary hypoplasia, on the presence of the vesicoureteral reflux and the possibility of recovering renal function.

Material and method: Study lot: Children diagnosed with vesicoureteral reflux between the ages of 0-18 years, of male sex interned in the II Pediatric Clinic in Tg.Mures in the last 10 years. Type of study: transversal, used method: retrospective study.

Results: Out of 170 children with vesicoureteral reflux, four children were diagnosed with posterior urethral valve.

Conclusions: The presence of the vesicoureteral reflux represents an unfavourable prognosis regarding the degree of renal function impairment.

Keywords: antenatal echography, ureterohydronephrosis, urethral valve ablation

Introduction:
Posterior urethral valves (PUV) represent a congenital barrier at the level of the posterior urethra which opposes miction. These are the most frequent obstructive congenital urethral lesions and affect only boys, being located in the distal section of the prostatic urethra [1]. The incidence of posterior urethral valves is estimated to be 1:5,000-8,000 of male newborns [2] and represents about 10% of prenatally diagnosed hydronephroses.

The obstruction determines dilation of the prostatic urethra upstream, hypertrophy of the bladder detrusor which obstructs the urethrobladder junction. The vesicoureteral reflux (VUR) is met in 2/3 cases, half of these being bilateral. The reflux can be secondary to the sub-bladder barrier, but it can also be considered primitive, determined by the intra-bladder ectopy of the ureter. The presence of the reflux is interpreted as a severe associated factor [3].

Semiology is pretty unspecific: unremitting fever, haematuria, sepsis, dehydration syndrome, urinary infections, dysuria, reduction of urinary jet, urinary incontinence, vesical globe, ureterohydronephrosis, renal failure [4].

Positive diagnosis conducts two aspects: antenatally diagnosis and postnatally diagnosis. Antenatally diagnosis is based on detection of the disease by fetal echography starting from the 28th week of pregnancy, when it only highlights the high attractiveness: ureterohydronephrosis [5, 6]. The postnatal diagnosis is based on the echographical examination during the neonatally or nurseryling child, which highlights bilateral hydronephrosis with the narrowing of the parenchyma, associated with renal dysplasia and mega-ureter due to uni- or bilateral reflux, relaxed urinary bladder with thick wall and dilated prostatic urethra [7].

The postnatally echography is used especially to evaluate the effect of the urethral valves on the urinary tract and also to diagnose the disease [8].

Miction cytography, retrograde urethrography, dosing serum creatinine completes the diagnosis [9, 10] and are considered to be the most important means of diagnosis. The treatment is surgical, from endoscopic ablation of the valves in the absence of chronic renal failure, to percutaneous pyelostomy, high lateral ureterostomy, and in severe cases vesicostomy [11], renal transplant [12,13]. Early and correct treatment will avoid renal failure, growth stopping and the impairment of sexual function and fertility.

The prognosis depends on how early the impairment is detected; on the presence of the VUR, of chronic renal failure (CRF) which is present in 1/3 of cases [14].

Purpose of the paper
To highlight how many children diagnosed ante- or postnatally with ureterohydronephrosis and VUR have as cause a sub-bladder obstruction, namely the presence of posterior urethral valves.

The main purpose of this paper is to analyze the degree of the renal function impairment in the case of vesicoureteral reflux associated or determined by PUV.
Material and method

Study lot:
Children diagnosed with vesicoureteral reflux between the ages of 0-18 years, of male sex, interned in the II Pediatric Clinic in Tg. Mures in the last 10 years.

Means of gathering data:
Data has been gathered by analyzing Observation sheets of children diagnosed with ureterohydronephrosis, vesicoureteral reflux, posterior urethral valves at the II Pediatric Clinic – Nephrology Department.

Criteria for inclusion:
- children aged between 0-18 years
- sure diagnosis of VUR and PUV

Criteria for exclusion:
- children aged between 0-18 years with medical history of renal impairment
- mistakes in urodynamic studies
- children aged between 0-18 years with sepsis, acute dehydration syndrome, unremitting fever having an etiology different than the renal one.

Target population:
- 170 patients with VUR and possible PUV diagnosis

Available population:
- research will begin with all children having VUR, ureterohydronephrosis discovered ante- and postnatally, associated or determined by posterior urethral valves.

Type of study:
- transversal, analytical, experimental.

Used method:
- retrospective study
- picked cases
- statistical method used – descriptive statistics
Since no figures were used which could lead to the identification of a patient, there is no informed consent.

Results
Out of 170 children with vesicoureteral reflux, four children were diagnosed with posterior urethral valve.

1st case
3-year old child with diagnosis:
- Bilateral ureterohydronephrosis
- Operated posterior urethral valve
- Relapsing high type urinary tract infection
- Deficient anemia

Discovered postnatally at the age of 4 months.
Treatment:
- valve ablation when he was 5 months old.
Evolution:
- favourable with repeated urinary infections and deficient anemia (Figure 1.).

2nd case
1-year and 4-month old child with diagnosis:
- Bilateral ureterohydronephrosis
- 1st degree left vesicoureteral reflux
- Posterior urethral valve
- Deficient anemia
Diagnosed antenatally – fetal echography at 30 weeks highlighted bilateral hydronephrosis, then exploratory cysotography highlighted urethral stenosis, posterior urethral valve and left vesicoureteral reflux.
Treatment:
- percutaneous cystostomy then valve ablation
Evolution:
- favourable

3rd case
9-year old child with diagnosis:
- 5th degree ureterohydronephrosis by sub-bladder barrier
- Posterior urethral valve
- 5th degree right vesicoureteral reflux
- Chronic renal failure
- Bilateral cutaneous ureterostomy
- Repeated urinary tract infections

This number is not consistent with that reported in Masca2011-lasi and Masca2011-Cluj concerning same clinical study.
Detected antenatally at 32 weeks of pregnancy, fetal echography visualizing bilateral ureterohydronephrosis. Treatment: bilateral cutaneous ureterostomy, then bilateral ureteral reimplantation and valve resection. Evolution with 5th degree vesicoureteral reflux and chronic renal failure presently with peritoneal dialysis (Figure 2).

**4th case**

3-year old child with diagnosis:
- Bilateral megadolicoureter
- 5th degree bilateral vesicoureteral reflux
- Posterior urethral valve
- 3rd degree chronic renal failure
- Bilateral cutaneous ureterostomy

**Fig. 2. Case 3 – Ureterohydronephrosis**
Detected postnatally at 5 weeks beginning with signs of 3rd degree ADS, urinary tract infection, the echography highlighted renal dysplasia; cystography and urography highlighted massive bilateral vesicoureteral reflux.

Treatment: bilateral ureterostomy at the age of 10 months Evolution: unfavourable with 3rd degree chronic renal failure, peritoneal dialysis (Figure 3 - Caz IV).

Discussions:
Out of the four children with PUV, three cases were diagnosed with VUR, one bilateral there is a similitude with the studied bibliography dates. In all the four cases the treatment was done surgically, from the ablation valves to cutanated bilateral ureterostomia, two of the patients evolving propitiously with repeated urinal infections, although one of the children presented VUR.

This congenital malformation culminates in its evolution with renal failure, observed fact at cases III and IV, where installation of VURuni or bilateral, repeated urinal infections, relatively aggravated the disease. RVU may be considered as an associated gravity factor, the two children needing peritoneal dialysis, being candidates in the future to renal transplant.

The urinal infection, obstruction, presional reflux and hyperfiltration, will excertiate a big pression at the growing child and will have a semnificative impact on the final prognostic.

PUV are rare malformations of the posterior urethra, but their existence can lead to serious changes in the upper urinary system, culminating with cronical renal failure, despite the early surgical solving of the obstructed urethral, thus lowering the quality of life for children sufferin from this disease.

Conclusions:
1. Posterior urethral diagnosis represents a challenge in the sense of detecting the impairment as early as possible (antenatally) and choosing the right therapeutic procedure in accordance with the degree of the renal impair-ment.
2. Vesicoureteral reflux, which can be secondary to the barrier, is interpreted as a severe associated factor.
3. Surgical treatment consists of endoscopic ablation of valves and ureterostomy. In the studied cases it lead to a favourable evolution in two cases and to chronic renal failure in the other two, requiring dialysis and finally a renal transplant.

References