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## Original Article

### **Presentation of Posterior Urethral Valves in Saudi Arabia in the 90's**

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**ABSTRACT.** To evaluate the age and mode of presentation of patients with posterior urethral valves (PUV) in the antenatal and postnatal periods, we analyzed the files of 108 patients with the diagnosis of PUV in four referral hospitals in Riyadh, Saudi Arabia from 1989 to 1999. Of the study patients, 29 (27%) were antenatally discovered, 41 (38%) in the first year of life and 38 (35%) after the first year of life. The mode of presentation was by antenatal ultrasound in 29 (27%) patients, urinary tract infection in 33 (30.4%) patients, poor urinary stream in 35 (32.4%) patients, retention of urine in neonatal life in eight (7.4%) patients and symptoms of renal impairment in three (2.8%) patients. We conclude that the antenatal detection rate of PUV in our study patients is less than the international one (70%), despite the fact that most of the antenatal follow-ups were done in centers where ultrasound was available for routine antenatal work up. This calls for more vigilance by the radiologists and obstetricians to enhance the rate of detection of PUV.

**Key words:** Posterior urethral valves, Antenatal diagnosis, Antenatal ultrasound, Saudi Arabia, Renal failure, Congenital urogenital anomalies, Antenatal hydronephrosis, Children, Renal ultrasound.

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### **Introduction**

Although posterior urethral valves (PUV) is not a common disease (1:5000 births),<sup>1</sup> its sequelae on the bladder function and the growing renal tissue<sup>2</sup> makes it one of the most challenging diseases and it may carry a mortality rate of 50%.<sup>3</sup>

The routine use of antenatal ultrasound in pregnant women has improved the antenatal diagnosis of bilateral hydronephrosis to 60-70%<sup>4</sup> enabling early treatment soon after birth, which has helped to reduce the mortality to 5%. Unfortunately, 50% of those who survive may develop renal impairment.<sup>5</sup>

This is a retrospective study of 108 patients with PUV managed at four referral hospitals in Riyadh, Saudi Arabia whose aim is to find the age and mode of presentation and the antenatal detection rate of PUV.

### Material and Methods

The medical files of 108 patients with PUV seen at four referral hospitals in Riyadh, Saudi Arabia (King Khalid University Hospital, King Fahad National Guard Hospital, King Faisal Specialist Hospital and Research Center and Security Forces Hospital) in the period from 1989 to 1999 were reviewed. Of all the study patients, only 25 (23%) were followed antenatally in the above-mentioned hospitals. The remaining 83 patients (77%) were referred from other hospitals in the Kingdom.

The data obtained included the age at presentation, the mode of presentation, the presence and degree of upper urinary tract dilatation at presentation and the differential renal function seen in the first renal DMSA scan.

According to the age at presentation, the study patients were classified into three groups: Group I when the diagnosis was suspected on antenatal ultrasound, Group II first year of life and group III after the first year of life. The mode of presentation was classified as:

- 1). routine antenatal detection,
- 2). urinary tract infection (UTI),
- 3). poor urinary stream,
- 4). urine retention in neonatal life,
- 5). symptoms of renal impairment.

Renal dilatation was classified according to the Society of Fetal Urology grading system<sup>6</sup> as 1) No or minimal dilatation Grade (G 0 or GI), 2) moderate dilatation (G2 & G3), and 3) severe dilatation (G4).

Impairment of renal function was considered when the first differential renal scan (DMSA) showed a decrease of 35% or more of uptake of isotope.<sup>7</sup>

### Results

The age of presentation, the mode of presentation, and the degree of renal dilatation are shown in Table 1, 2 and 3 respectively. Of the study patients, 29 (27%) were antenatally discovered, 41 (38%) discovered in the first year of life and 38 (35%) discovered after the first year of life. The mode of presentation was by antenatal ultrasound in 29 (27%) patients, urinary tract infection in 33 (30.4%) patients, poor urinary stream in 35 (32.4%) patients, retention of urine in neonatal life in eight (7.4%) patients and symptoms of renal impairment in three (2.8%) patients.

Differential renal scan (DMSA) done at presentation in the 216 kidneys involved, showed reduction or loss of function in 102 (47%).

Table 1. Age at presentation of the study patients.

Age	No. of patients (%)
Antenatal	29 (27%)
1 <sup>st</sup> year of life	41 (38%)
After 1 <sup>st</sup> year of life	38 (35%)

Table 2. Mode of presentation of the study patients.

Mode	No. of patients (%)
Antenatal diagnosis	29 (27%)
Urinary tract infection	33 (30.4%)
Poor urinary stream	35 (32.4%)
Retention of urine	8 (7.4%)
Symptoms of renal impairment	3 (2.8)

Table 3. Degree of the upper tract dilatation.

Degree	No. of renal units (%)
No or minimal dilatation (G0, G1)	62 (29%)
Moderate dilatation (G2, G3)	55 (25%)
Severe dilatation (G4)	99 (46%)

## Discussion

The anomalies of the urogenital system are the most common antenatally diagnosed congenital anomalies (14:1000 births).<sup>8</sup> The wide spread use of antenatal ultrasound as a routine test in pregnancy has improved the antenatal diagnosis of such anomalies, in particular hydronephrosis, enabling the urologists to intervene early.<sup>8-13</sup>

Corteville et al<sup>14</sup> found postnatal studies were warranted if the antero-posterior renal pelvic diameter was > 7mm on the antenatal ultrasound after 33 weeks, or > 4mm before 33 weeks of gestation. Although the presence of oligohydramnios and distended bladder is very suggestive of PUV, their presence is not always diagnostic for such diagnosis. All patients with antenatal hydronephrosis, should have VCUG routinely soon after birth.<sup>15</sup>

Despite the availability of the ultrasound as a part of antenatal work up of pregnant women in almost all the hospitals in the Kingdom, only 29 patients (27%) in our group were diagnosed antenatally and the rest (79) patients (73%) were missed. This detection rate of 27% is far less than the internationally accepted detection rate reported in the literature (60-70%).<sup>4</sup>

Posterior urethral valves being an uncommon anomaly (1:5000 birth)<sup>1</sup> does not make it less important. Its effect on the upper urinary tract with the associated significantly high incidence of renal impairment in up to 50%<sup>3</sup> of the cases

makes it one of the most challenging diseases to treat and calls for early detection.<sup>4</sup> Since obstructive uropathies are the commonest cause of renal failure needing dialysis in the pediatric age group in the Kingdom,<sup>16</sup> it is mandatory for the radiologists and obstetricians to be more vigilant during the antenatal follow-up of pregnant mothers to the possibility of this condition.

Obstetricians are encouraged to perform a routine antenatal ultrasound after the 28<sup>th</sup> week of gestation,<sup>8-13</sup> and all neonates with antenatally diagnosed hydronephrosis should be covered with antibiotics soon after birth,<sup>13</sup> and properly investigated to define the anomaly.<sup>13</sup> In addition, all children with urinary tract infection should be thoroughly investigated by ultrasound and voiding cystourethrogram.<sup>2</sup>

We conclude that the antenatal detection rate of PUV in our study patients is less than the international one (70%), despite the fact that most of the antenatal follow-ups were done in centers where ultrasound was available for routine antenatal work up. This calls for more vigilance by the radiologists and obstetricians to enhance the rate of detection of PUV.

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