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ORIGINAL ARTICLE

Prospective Evaluation of Fetal Pyelectasis Detected on Second and Third-Trimester Ultrasonography and Neonatal Outcome

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ABSTRACT

Context: Fetal pyelectasis is a commonly detected abnormality on antenatal ultrasonography. Although many cases resolve spontaneously, persistent or severe dilatation may be associated with significant postnatal urinary tract pathology. Identification of antenatal sonographic features associated with adverse neonatal outcomes may help in appropriate counselling and postnatal follow-up.

Aims: To evaluate the relationship between antenatally detected fetal pyelectasis and neonatal outcomes and to assess whether the severity of pyelectasis in the third trimester predicts persistent postnatal pathology and the need for surgical intervention.

Settings and Design: Prospective observational study conducted among pregnant women with fetuses diagnosed with renal pyelectasis on antenatal ultrasonography.

Methods and Material: A total of 41 fetuses with antenatally detected renal pyelectasis were enrolled. Serial ultrasonographic assessments were performed during the second and third trimesters. The anteroposterior diameter of the renal pelvis and the severity of pyelectasis were assessed. Postnatal clinical and radiological follow-up was performed for all liveborn infants. Antenatal sonographic findings were compared with postnatal outcomes.

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Statistical analysis used: Descriptive and inferential statistical analyses were performed to assess the association between antenatal sonographic findings and postnatal outcomes. Categorical variables were compared using appropriate tests, and continuous variables were compared between outcome groups. A p value <0.05 was considered statistically significant.

Results: Of the 41 enrolled fetuses, 40 liveborn infants were available for postnatal evaluation. Spontaneous normalization of pyelectasis during pregnancy occurred in 42.5% of cases, while postnatal resolution was observed in 72.5% of neonates. Persistent or progressive urinary tract dilatation was documented in 27.5% of infants, and surgical intervention was required in 7.5%. Third-trimester severity showed a significant association with postnatal persistence (p<0.001) and the need for surgical intervention (p=0.047). Fetuses with moderate-to-severe third-trimester pyelectasis had a 100% rate of persistent postnatal pathology. The mean third-trimester anteroposterior renal pelvic diameter was significantly higher in neonates with persistent disease than in those with spontaneous resolution (11.93 ± 1.74 mm vs. 5.99 ± 1.23 mm; p<0.001).

Conclusions: Most cases of antenatally detected fetal pyelectasis resolved spontaneously. Persistent moderate-to-severe third-trimester pyelectasis and a larger third-trimester renal pelvic diameter were strongly associated with persistent postnatal pathology and the need for intervention. Third-trimester ultrasonography may therefore be useful for risk stratification and planning appropriate postnatal follow-up.

KEYWORDS

• Fetal pyelectasis • Antenatal hydronephrosis • Ultrasonography • Renal pelvic diameter

Key Messages: Most cases of antenatally detected fetal pyelectasis resolve spontaneously, but persistent or moderate-to-severe third-trimester pyelectasis is strongly associated with postnatal urinary tract pathology. A higher third-trimester renal pelvic diameter was also significantly associated with persistent disease and the need for intervention. Third-trimester ultrasonography may therefore help in identifying fetuses at higher risk and in planning appropriate postnatal evaluation and follow-up.

INTRODUCTION

Antenatal ultrasonography is an essential component of modern obstetric care. It enables early detection of fetal structural abnormalities and also facilitates appropriate prenatal and postnatal measures.[1] The widespread use of second and third trimester ultrasonography has improved the prenatal diagnosis of urinary tract dilatation and other associated renal abnormalities.

Fetal pyelectasis is defined as dilatation of the renal pelvis. It is assessed by measuring anteroposterior renal pelvic diameter on ultrasound. It encompasses a spectrum ranging from transient physiological dilatation to significant obstructive uropathy requiring postnatal intervention.[2] Mild pyelectasis often resolves spontaneously but persistent or severe dilatation can be associated with congenital anomalies of the kidney and urinary tract. These may include pelviureteric junction obstruction, vesicoureteric reflux and posterior urethral valves.[3]

The reported prevalence of antenatal hydronephrosis ranges from 1% to 5% of pregnancies. It makes it one of the most commonly diagnosed fetal abnormalities. Most cases are identified during the second trimester. However, ultrasound evaluation during the third trimester provides information regarding progression, persistence or resolution of dilatation. Studies have demonstrated that

third-trimester renal pelvic measurements are more strongly associated with postnatal pathology than isolated second-trimester findings.[4,5]

Persistent urinary tract obstruction may result in recurrent urinary tract infections, progressive renal damage, hypertension and long-term impairment of renal function.[6] Thus, antenatal detection is necessary for risk stratification, targeted neonatal evaluation and timely intervention if required.

Predicting postnatal outcomes remains challenging even when we have advanced in prenatal imaging and have standardized classification systems. Larger renal pelvic diameters, bilateral involvement and persistence into late gestation have been associated with adverse outcomes. The prognostic value of antenatal findings alone remains limited. Consequently, postnatal correlation becomes essential for clinical significance of antenatal pyelectasis and guiding management.

The present study was undertaken to evaluate fetal pyelectasis detected during second and third-trimester ultrasonography and to assess its association with neonatal outcomes in a tertiary care setting.

MATERIALS AND METHODS

Study Design and Setting

This prospective observational study was conducted in a tertiary care teaching hospital over a period of 18 months from March 2024 to September 2025. Pregnant women undergoing routine antenatal ultrasonography during the second and third trimesters were screened for fetal renal pelvic dilatation. Study Population.

All fetuses with antenatally detected renal pelvic dilatation (mild, moderate, or severe) were included and followed prospectively.

Inclusion Criteria was pregnant women in the second or third trimester of gestation, singleton pregnancies, fetuses with sonographically diagnosed renal pelvic dilatation (mild, moderate, or severe) detected during the second or third trimester, participants who wer willing to provide informed written consent and availability for antenatal and postnatal follow-up.

Exclusion Criteria was first-trimester pregnancies, multiple gestations, fetuses with major extra-renal congenital anomalies, known chromosomal or genetic abnormalities, intrauterine fetal demise or perinatal death, pregnancies terminated following prenatal diagnosis, cases lost to antenatal or postnatal follow-up and maternal chronic systemic illnesses that could independently affect fetal renal development.

Sample Size

As fetal pyelectasis is a relatively uncommon antenatal finding, all consecutive eligible cases diagnosed during the 18-month study period were enrolled prospectively. A total of 41 fetuses with antenatally detected renal pyelectasis were identified and included in the study.

Ultrasonographic Evaluation

All participants underwent routine obstetric ultrasonography using standard fetal imaging protocols. Fetal kidneys were examined in transverse sections at the level of the renal hilum. The anteroposterior renal pelvic diameter (APRPD) was measured in millimeters at the widest portion of the renal pelvis.

Severity of pyelectasis was classified according to gestational age-specific APRPD measurements:

Second Trimester: Mild pyelectasis: APRPD 4–7 mm, Moderate pyelectasis: APRPD 7–10 mm and Severe pyelectasis: APRPD >10 mm

Third Trimester: Mild pyelectasis: APRPD up to 10 mm, Moderate pyelectasis: APRPD 10–15 mm and Severe pyelectasis: APRPD >15 mm

For each fetus, the following parameters were recorded:

- Gestational age at diagnosis
- Laterality (unilateral or bilateral involvement)
- APRPD measurements
- Progression, persistence, or resolution during pregnancy
- Presence of associated urinary tract abnormalities
- Amniotic fluid volume
- Fetal growth parameters

Serial antenatal ultrasound examinations were performed according to routine obstetric practice until delivery.

Antenatal Follow-up

All enrolled fetuses were followed longitudinally from the time of diagnosis until birth. Serial ultrasonographic assessments were used to evaluate:

- Stability of renal pelvic dilatation
- Progression of pyelectasis severity
- Resolution of dilatation
- Development of associated urinary tract abnormalities
- Changes in amniotic fluid volume

The gestational age at first detection and timing of persistence into late pregnancy were documented to assess their predictive value for postnatal outcomes.

Postnatal Evaluation

All neonates with antenatally diagnosed pyelectasis underwent postnatal clinical and radiological assessment.

The primary postnatal evaluation consisted of renal ultrasonography performed according to institutional protocol after birth. Renal ultrasonography was performed after birth and repeated at scheduled intervals during the six-month follow-up period.

Postnatal outcomes assessed included complete resolution of pyelectasis, persistent hydronephrosis, vesicoureteric reflux, pelviureteric junction obstruction, posterior urethral valves, other congenital anomalies of the kidney and urinary tract, requirement for medical management and requirement for surgical intervention. The final diagnosis was established based on postnatal imaging findings and specialist evaluation when indicated. Predictive analyses were restricted to fetuses with persistent third-trimester pyelectasis and complete postnatal follow-up data.

Outcome Measures

Primary Outcome was to find correlation between antenatally detected moderate and severe pyelectasis and postnatal renal pathology and need for postnatal surgical intervention.

Secondary Outcomes were to determine natural history of fetal pyelectasis from prenatal detection to delivery. To find correlation between antenatal progression of renal pelvic dilatation and postnatal evolution, association between gestational age at first diagnosis and subsequent need for postnatal surgery and rate of spontaneous prenatal or postnatal resolution.

Statistical Analysis

Data were entered into a computerized database and analyzed using appropriate statistical software.

Continuous variables were expressed as mean ± standard deviation or median with interquartile range, depending on data distribution. Categorical variables were presented as frequencies and percentages.

Comparisons between moderate and severe pyelectasis groups were performed using:

- Student's t-test or Mann–Whitney U test for continuous variables.
- Chi-square test or Fisher's exact test for categorical variables.

Associations between categorical variables were assessed using Chi-square or Fisher's exact tests, while continuous variables were compared using Student's t-test or Mann–Whitney U test, as appropriate. A p-value <0.05 was considered statistically significant.

Ethical Considerations

The study was approved by the Institutional Ethics Committee before commencement. Written informed consent was obtained from all participants prior to enrollment. All data were anonymized before analysis, and confidentiality was maintained throughout the study. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

RESULTS

A total of 41 fetuses with antenatally detected renal pyelectasis were enrolled during the study period. One pregnancy underwent medical termination following antenatal diagnosis and was excluded from postnatal analyses. Consequently, neonatal and postnatal outcome analyses were performed on 40 liveborn infants.

The baseline maternal and pregnancy characteristics are presented in **Table 1.** The mean maternal age was 25.49 ± 4.30 years. Multigravidae constituted a slightly higher proportion of the study population

than primigravidae (53.7% vs. 46.3%). The majority of pregnancies occurred in non-consanguineous marriages (87.8%), while only two women (4.9%) had associated medical disorders during pregnancy. A history of urogenital anomalies was documented in one participant (2.4%), and none had a history of fetal pyelectasis in a previous pregnancy.

The mean gestational age at second-trimester ultrasonography was 22.44 ± 2.74 weeks, whereas the mean gestational age at third-trimester evaluation was 32.90 ± 1.34 weeks. Adequate amniotic fluid volume was present in nearly all pregnancies during both second-trimester (97.6%) and third-trimester (95.0%) assessments, suggesting that most cases represented isolated fetal urinary tract dilatation without significant compromise of fetal renal function (Table 1).

Table 1: Baseline Maternal Characteristics and Antenatal Sonographic Findings (n=41)

Variable	Value
Maternal age (years), mean ± SD	25.49 ± 4.30
Primigravida, n (%)	19 (46.3)
Multigravida, n (%)	22 (53.7)
Non-consanguineous marriage, n (%)	36 (87.8)
Medical disorders during pregnancy, n (%)	2 (4.9)
History of urogenital anomalies, n (%)	1 (2.4)
Gestational age at second-trimester scan (weeks), mean ± SD	22.44 ± 2.74
Gestational age at third-trimester scan (weeks), mean ± SD	32.90 ± 1.34
Adequate AFI in second trimester, n (%)	40 (97.6)
Adequate AFI in third trimester, n (%)	38 (95.0)
Second trimester severity	
No pyelectasis	12 (29.3)
Mild pyelectasis	25 (61.0)
Moderate pyelectasis	3 (7.3)
Severe pyelectasis	1 (2.4)
Third trimester severity	
No pyelectasis	17 (42.5)
Mild pyelectasis	14 (35.0)
Moderate pyelectasis	8 (20.0)
Severe pyelectasis	1 (2.5)
Bilateral involvement (third trimester)	15 (37.5)
Right unilateral	5 (12.5)
Left unilateral	3 (7.5)
Associated anomalies	5 (12.5)

The prenatal ultrasonographic characteristics and their evolution during pregnancy are summarized in **Table 1.** During the second trimester, mild pyelectasis was the predominant finding, observed in 25 fetuses (61.0%), while moderate and severe pyelectasis were identified in only 7.3% and 2.4% of cases, respectively. Bilateral involvement was the most common pattern, occurring in 46.3% of fetuses.

At third-trimester reassessment, spontaneous normalization of renal pelvic dilatation was observed in 17 fetuses (42.5%). Mild, moderate, and severe pyelectasis persisted in 35.0%, 20.0%, and 2.5% of fetuses, respectively. Bilateral involvement remained the most frequent pattern (37.5%). Associated anomalies were identified in five fetuses (12.5%), including bladder distension, dilated ureter, cleft palate, and gross hydronephrosis.

Among the 11 fetuses with serial APD measurements available in both the second and third trimesters, pyelectasis worsened in 45.5% and remained stable in another 45.5%, whereas improvement was observed in only one fetus (9.1%). These findings indicate that the majority of fetuses with persistent antenatal pyelectasis demonstrated either progression or persistence of renal pelvic dilatation during gestation **(Table 1)**. Among the 11 fetuses with serial measurements available during both trimesters, pyelectasis worsened in 45.5%, remained stable in 45.5%, and improved in 9.1%.

Perinatal and postnatal outcomes are summarized in **Table 2**. A marked male predominance was observed, with male neonates accounting for 85.0% of live births. The mean birth weight was 2.81 ± 0.39 kg, and 35.0% of neonates had a birth weight below 2.5 kg. Only one neonate (2.5%) was delivered preterm, and NICU admission was required in two neonates (5.0%).

Postnatally, spontaneous resolution of pyelectasis occurred in 29 of 40 neonates (72.5%), whereas persistent or progressive urinary tract dilatation was documented in 11 neonates (27.5%). Most neonates required no intervention (72.5%), while eight (20.0%) were managed conservatively with serial follow-up. Surgical intervention was required in three neonates (7.5%). No neonate required hospitalization for urinary symptoms during the follow-up period **(Table 2)**.

Table 2: Perinatal and Postnatal Outcomes (n=40)

Variable	Value
Male sex, n (%)	34 (85.0)
Female sex, n (%)	6 (15.0)
Birth weight (kg), mean ± SD	2.81 ± 0.39
Birth weight <2.5 kg, n (%)	14 (35.0)
Preterm delivery, n (%)	1 (2.5)
NICU admission, n (%)	2 (5.0)
Hospitalization due to urinary symptoms, n (%)	0
Resolution of pyelectasis, n (%)	29 (72.5)
Persistent/increased pyelectasis, n (%)	11 (27.5)
No intervention required, n (%)	29 (72.5)
Observation only, n (%)	8 (20.0)
Surgical intervention, n (%)	3 (7.5)

To determine the prognostic significance of antenatal severity, third-trimester pyelectasis severity was correlated with postnatal evolution **(Table 3)**. Analysis was restricted to fetuses with persistent third-trimester pyelectasis and complete postnatal follow-up data (n=23).

A highly significant association was observed between third-trimester severity and postnatal outcome (χ^2 = 16.13, Fisher's exact test, p<0.001). Among fetuses with mild third-trimester pyelectasis, 85.7% experienced spontaneous postnatal resolution, whereas only 14.3% demonstrated persistent disease. In contrast, none of the fetuses with moderate-to-severe third-trimester pyelectasis showed spontaneous resolution, and all exhibited persistent postnatal pathology (100%).

These findings demonstrate that increasing third-trimester severity is strongly associated with persistence of urinary tract dilatation after birth and represents an important predictor of adverse postnatal outcome **(Table 3)**.

Table 3: Association of Third-Trimester Severity with Postnatal Outcome and Management (n=23)

Third-Trimester Severity	Resolved n (%)	Persistent n (%)	No Intervention n (%)	Observation n (%)	Surgery n (%)
Mild (n=14)	12 (85.7)	2 (14.3)	12 (85.7)	2 (14.3)	0 (0.0)
Moderate (n=8)	0 (0.0)	8 (100.0)	0 (0.0)	6 (75.0)	2 (25.0)
Severe (n=1)	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	1 (100.0)
Total (n=23)	**12 (52.2)**	**11 (47.8)**	**12 (52.2)**	**8 (34.8)**	**3 (13.0)**

P value for severity vs postnatal outcome: Fisher's exact test, p < 0.001

P value for severity vs management: Fisher's exact test, p = 0.047

The relationship between antenatal severity and postnatal intervention is presented in **Table 3.** Third-trimester severity demonstrated a statistically significant association with the requirement for surgical intervention (Fisher's exact test, p=0.047).

None of the fetuses with mild third-trimester pyelectasis required surgical treatment. Among moderate cases, 25.0% ultimately underwent surgery, while the single fetus with severe pyelectasis required operative management. Overall, one-third (33.3%) of fetuses with moderate-to-severe pyelectasis required surgical correction.

A clear gradient in management requirements was observed. Most mild cases required either no intervention (85.7%) or observation alone (14.3%). In contrast, moderate and severe pyelectasis were associated with a substantially higher need for prolonged surveillance and surgical treatment, highlighting the clinical relevance of antenatal severity assessment **(Table 3).**

The predictive value of third-trimester APD is shown in **Table 4.** Neonates whose pyelectasis resolved spontaneously had a mean third-trimester APD of 5.99 ± 1.23 mm, whereas those with persistent disease had a significantly higher mean APD of 11.93 ± 1.74 mm.

This difference was highly significant (Mann–Whitney U test, W=0, p<0.001). The findings indicate that larger third-trimester APD measurements are strongly associated with persistent postnatal pathology and may serve as an objective sonographic marker for identifying fetuses at increased risk of adverse postnatal outcomes **(Table 4)**.

An APD approaching 12 mm in the third trimester was strongly associated with persistent postnatal pathology, whereas an APD around 6 mm was typically associated with spontaneous resolution.

The influence of maternal age, parity, and neonatal sex on postnatal evolution was evaluated and is summarized in **Table 4.** Although male neonates constituted the majority of the cohort, postnatal persistence rates were comparable between male and female infants (26.5% vs. 33.3%). Female sex was not significantly associated with persistent disease (OR=1.377, p=1.000).

Similarly, multigravidae demonstrated a slightly higher proportion of persistent pyelectasis compared with primigravidae (33.3% vs. 21.1%); however, this difference did not reach statistical significance (OR=1.846, p=0.488). Maternal age greater than 25 years was also not associated with adverse postnatal outcome (OR=1.229, p=1.000).

Thus, demographic characteristics showed no significant relationship with postnatal evolution, suggesting that sonographic parameters are considerably more important predictors of outcome than maternal or neonatal factors **(Table 4)**.

Table 4: Predictors of Persistent Postnatal Pyelectasis

Variable	Resolved	Persistent	Effect Estimate	P value
Third-trimester APD (mm), mean ± SD	5.99 ± 1.23	11.93 ± 1.74	—	<0.001*
Male sex	25 (73.5%)	9 (26.5%)	Reference	
Female sex	4 (66.7%)	2 (33.3%)	OR 1.377	1.000
Primigravida	15 (78.9%)	4 (21.1%)	Reference	
Multigravida	14 (66.7%)	7 (33.3%)	OR 1.846	0.488
Maternal age ≤25 years	17 (70.8%)	7 (29.2%)	Reference	
Maternal age >25 years	12 (75.0%)	4 (25.0%)	OR 1.229	1.000

*Mann – Whitney U test

DISCUSSION

Fetal pyelectasis is one of the most commonly identified abnormalities during routine antenatal ultrasonography. It represents a spectrum ranging from transient physiological dilatation to clinically significant urinary tract pathology. The present prospective study evaluated the natural history of fetal pyelectasis detected during the second and third trimesters. It also assessed its relationship with neonatal outcomes. The findings demonstrate that most cases resolved spontaneously either before or after birth. The persistent moderate-to-severe third-trimester pyelectasis and larger third-trimester anteroposterior pelvic diameters (APD) were strongly associated with adverse postnatal outcomes and the need for intervention.

In the present study spontaneous normalization of pyelectasis during pregnancy was observed in 42.5% of foetuses. The postnatal resolution occurred in most (72.5%) of neonates. These findings support the generally favourable prognosis reported in the literature. Farladansky-Gershnabel *et al*. reported prenatal resolution in 27.8% of fetuses with second-trimester pyelectasis measuring 6–9.9 mm, while most remaining cases either remained stable or progressed to hydronephrosis.[7] Similarly Lavender *et al*. observed resolution in 74.2% of cases at the first third-trimester follow-up and 84.1% by the end of pregnancy.[8] Signorelli *et al*. reported normalization in 18.6% of fetuses and reduction in pelvic dilatation in a further 34.6%, thus emphasizing the dynamic nature of antenatal pyelectasis.[9] Collectively all these studies and our findings suggest that a major proportion of antenatally detected pyelectasis follows a benign course and resolves spontaneously with advancing gestation or during the infancy stage.

The prenatal evolution observed in our study further supports previous reports. Among fetuses with serial measurements available pyelectasis worsened in 45.5%. It remained stable in 45.5% and improved in only 9.1%. Signorelli *et al*. reported worsening in 16.4%, persistence in 30.7% and partial regression in 34.6% of cases.[9] Pereira *et al*. conducted a prospective longitudinal study of mild bilateral pyelectasis. The author found progression in only 14.6% of fetuses, while 85.4% remained stable or improved.[10] Differences between the studies may reflect variations in inclusion criteria, severity grading and follow-up protocols. Nevertheless, all studies indicate that progression of antenatal dilatation identifies a subgroup which requires closer

surveillance because of a higher likelihood of persistent postnatal pathology.

A notable finding of the present study was the high rate of spontaneous postnatal resolution. Only one – fourth (27.5%) of neonates demonstrated persistent or progressive urinary tract dilatation. Surgical intervention was required in a few (7.5%) cases only. These findings are comparable with those reported by Farladansky-Gershnabel *et al*. The author observed neonatal hydronephrosis in 46.3% of fetuses with prenatal pyelectasis but found that most cases did not require surgical intervention.[7] Similarly, Velineni *et al*. reported surgical treatment in only 5.6% of infants despite persistent pyelectasis in a proportion of cases.[11] Rezazadeh *et al*. demonstrated urinary tract dilatation on postnatal imaging in only 10.6% of neonates with isolated mild pyelectasis. He concluded that overall neonatal outcomes were favourable.[12] These findings reinforce the concept that antenatal detection primarily serves to identify a small subgroup at risk for clinically significant pathology while avoiding unnecessary intervention in the majority.

The most important observation in our study was the strong association between third-trimester severity and postnatal outcome. All fetuses with moderate-to-severe third-trimester pyelectasis demonstrated persistent postnatal pathology. 85.7% of fetuses with mild pyelectasis resolved spontaneously in this study. Furthermore, one-third of moderate-to-severe cases ultimately required surgical correction. Similar observations have been consistently reported in previous studies. Abhishek and Bhavana found that none of the neonates with mild third-trimester dilatation required surgery, whereas 9% of moderate and 33% of severe cases underwent operative management.[13] Loardi *et al*. reported a 25% risk of surgery among fetuses with moderate pyelectasis which increased to 60% in severe cases.[14] Thornburg *et al*. showed that third-trimester pyelectasis was a better predictor of postnatal hydronephrosis and surgery than second-trimester measurements.[15] Together these findings emphasize that persistence of pyelectasis into late gestation is clinically more relevant than isolated second-trimester findings and should guide counselling and postnatal planning.

Third-trimester APD emerged as the strongest predictor of postnatal outcome in the present study. Neonates with persistent disease had a much larger mean APD than those with spontaneous resolution (11.93 ± 1.74 mm versus 5.99 ± 1.23 mm, $p<0.001$). Notably an APD approaching 12 mm was strongly associated with persistent pathology. These findings closely mirror those of Abhishek and Bhavana who reported that fetuses requiring surgery had a mean APD of 11.3 mm and identified an APD greater than 11 mm as the optimal threshold for predicting surgical intervention.[13] Cohen-Overbeek *et al*. showed that third-trimester APD measurements were highly predictive of postnatal renal pathology with increasing diagnostic accuracy at thresholds of 8–10 mm.[16] Kim *et al*. reported that a mid-trimester APD ≥6 mm significantly increased the risk of persistent or progressive pyelectasis before delivery.[17] The consistency of these findings across studies highlights APD as an objective and reproducible marker for risk stratification.

Male predominance was another notable observation in the present cohort. 85% of the affected neonates were male. Previous investigators have consistently reported a higher frequency of pyelectasis among the male fetuses. Farladansky-Gershnabel *et al*. found a significantly higher prevalence among males (68.5%) while Rezazadeh *et al*. reported that 73.3% of affected fetuses were male.[7,12] Mohammadi *et al*. similarly observed a higher frequency among male fetuses.[18] However, despite this predominance our study found no significant association between neonatal sex and persistence of postnatal disease. Similar observations were reported by Mohammadi *et al*. which were suggesting that male sex may be associated with occurrence but not necessarily with disease progression.[18]

In contrast to the sonographic variables, maternal age and parity were not significantly associated with postnatal outcome in our study. These findings suggest that demographic characteristics contribute little to prognostication once pyelectasis has been identified. Instead of this severity of dilatation and APD measurements appear to be the principal factors of outcome. This observation is consistent with contemporary literature which increasingly emphasizes imaging-based

risk stratification over maternal demographic characteristics.

CONCLUSION

Most cases of antenatally detected fetal pyelectasis resolved spontaneously and had favourable neonatal outcomes in the study. Persistent moderate-to-severe third-trimester pyelectasis and larger third-trimester renal pelvic diameters were significantly associated with persistent postnatal pathology and the need for intervention. Third-trimester ultrasonography is therefore identified as a valuable tool for identifying fetuses at increased risk and guiding postnatal follow-up and management.

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Conflict of Interest: None to be declared

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