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Original Research Article

Adverse obstetric outcomes in congenital Müllerian anomalies: experience from a high-risk pregnancy unit

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ABSTRACT

Background: Congenital Müllerian anomalies are associated with increased risk of adverse obstetric outcomes. Data from Indian centers remain limited, especially from high-risk obstetric units.
Methods: A 10-year retrospective record-based cross-sectional analysis was conducted at a tertiary care center from August 2011 to July 2021. A total of 53 pregnant women diagnosed with congenital uterine anomalies were included. Outcomes assessed included preterm birth, abortions, PPROM, malpresentation, fetal growth restriction, and placenta accreta spectrum/postpartum hemorrhage..
Results: The most common anomaly was bicornuate uterus (41.5%, n=22), followed by unicornuate uterus (26.3%, n=14), septate/subseptate uterus (15%, n=8), arcuate uterus (15%, n=8), and uterus didelphys (n=1). Preterm birth occurred in 30 women (56.6%), abortion in 13 (24.5%), PPROM in 11 (20.7%), malpresentation in 15 (28.3%), fetal growth restriction in 15 (28.3%), and placenta accreta spectrum and/or postpartum hemorrhage in 10 cases (18.8%).
Conclusions: Congenital Müllerian anomalies substantially increase obstetric risk, particularly preterm birth, PPROM, malpresentation, and hemorrhage. Early identification and risk-stratified antenatal surveillance are essential in resource-limited settings.

Keywords: Congenital Müllerian anomalies, High-risk pregnancy, Adverse obstetric outcomes

INTRODUCTION

Congenital Müllerian anomalies (CMAs) result from abnormal fusion or canalization of the Müllerian ducts during embryogenesis.[1,2] Their estimated prevalence ranges from 1–5% in reproductive-age women and is higher among women with reproductive failure.[3,4] Obstetric complications associated with CMAs include spontaneous abortion, preterm labor, maladaptive uterine growth leading to malpresentation, fetal growth restriction, and abnormal placentation.[5-7] However, data from Indian high-risk obstetric centers remain limited.

The objective of the present study was to evaluate the fetomaternal outcomes of pregnancies with congenital uterine anomalies.

Outcomes evaluated: preterm birth, abortion, preterm premature rupture of membranes (PPROM), malpresentation, fetal growth restriction (FGR/IUGR), and placenta accreta spectrum or postpartum hemorrhage.

METHODS

Study type

This was a retrospective, anonymized, record-based cross-sectional study.

Study place

The study was conducted at the Department of Obstetrics and Gynecology, Bhagwan Mahaveer Jain Hospital, Bangalore, India.

Study period

The duration of the study was from August 2011 – July 2021 (10 years).

Selection criteria

Pregnant women diagnosed with congenital Müllerian anomalies during pregnancy, confirmed by ultrasound and/or intraoperative findings were included.

Sample size

The sample size was 53 women.

Data were extracted from hospital medical records and analyzed retrospectively.

Statistical analysis

Data were entered into Microsoft Excel and analyzed descriptively. Categorical variables were summarized as frequencies and percentages. The distribution of obstetric complications across different types of congenital Müllerian anomalies was evaluated descriptively. Results are presented using tables to illustrate the frequency of outcomes.

RESULTS

A total of 53 pregnancies complicated by congenital Müllerian anomalies were identified during the 10-year study period. Among these, 28 cases were booked at the study center while 25 were referred from peripheral facilities.

Continuous variables were not applicable in this dataset as outcomes were categorical in nature. The most common uterine anomaly identified was bicornuate uterus, accounting for 22 cases (41.5%), followed by unicornuate uterus in 14 cases (26.3%). Septate or subseptate uterus and arcuate uterus were each observed in 8 cases (15.0%), while uterus didelphys was identified in 1 case (1.9%) (Table 1).

Obstetric complications were common in this cohort. Preterm birth was the most frequently observed complication, occurring in 30 women (56.6%). Malpresentation and fetal growth restriction were each observed in 15 cases (28.3%). Abortion occurred in 13 pregnancies (24.5%), while preterm premature rupture of membranes (PPROM/PROM) occurred in 11 cases (20.7%). Placenta accreta spectrum and/or postpartum hemorrhage were reported in 10 cases (18.8%). (Table 2).

Multiple complications were observed in several pregnancies. The distribution of complications across different types of uterine anomalies is illustrated in Table 3.

Table 1: Distribution of congenital Müllerian anomalies.

Type of anomaly	Number of cases (N)	Percentage (%)
Bicornuate uterus	22	41.5
Unicornuate uterus	14	26.3
Septate/subseptate uterus	8	15.0
Arcuate uterus	8	15.0
Uterus didelphys	1	1.9
Total	53	100

Table 2: Obstetric complications in pregnancies with Müllerian anomalies.

Complication	Number of cases (N)	Percentage (%)
Preterm birth	30	56.6
Abortion	13	24.5
PPROM/PROM	11	20.7
Malpresentation	15	28.3
Fetal growth restriction	15	28.3
Placenta accreta spectrum	10	18.8
PPH	9	16.9

Table 3: Distribution of obstetric complications according to type of congenital Müllerian anomaly.

Type of anomaly	Total cases	PPROM /PROM	Preterm birth	FGR	Placenta accreta spectrum	Malprese-ntation	PPH
Bicornuate uterus	22	5	12	5	7	7	3
Unicornuate uterus	14	3	10	6	2	2	2
Septate/subseptate uterus	8	2	5	3	1	3	3
Arcuate uterus	8	1	3	1	0	3	1
Uterus didelphys	1	0	0	0	0	0	0
Total	53	11	30	15	10	15	9

DISCUSSION

The present study evaluated obstetric outcomes in pregnancies complicated by congenital Müllerian anomalies over a 10-year period in a tertiary care high-risk obstetric unit. The obstetric outcomes observed in the present study were compared with previously published studies, as summarized in Table 4. In the present study of 53 cases, bicornuate uterus was the most common anomaly (41.5%), similar to the findings of Hua et al, whereas Fox et al, Zhang et al, and Bhushan et al reported septate uterus as the predominant anomaly, indicating population-based variation. Preterm birth was the most frequent complication in our study (56.6%), which is higher than that reported by Fox et al, Hua et al, and Zhang et al, and comparable to Bhushan et al (44%).[1,4,6,8] This increased risk may be due to reduced uterine cavity size and impaired uterine distensibility, particularly in bicornuate uteri. Fetal growth restriction was observed in 28.3% of cases, comparable to Fox et al (27.9%) and Zhang et al (22.4%), but higher than Hua et al (13%), possibly reflecting compromised uteroplacental perfusion. The incidence of PPROM/PROM in the present study (20.7%) was higher than that reported by Fox, Hua, and Zhang, though lower than Bhushan et al. Structural uterine abnormalities and associated cervical insufficiency may predispose to early membrane rupture. Malpresentation occurred in 28.3% of cases, consistent with previously reported rates, supporting the role of abnormal uterine anatomy in restricting fetal movements and version. Placenta accreta spectrum was observed in 18.8% of cases in the present study. This appears higher than that reported in comparable studies and may reflect the tertiary care referral nature of our center. Postpartum hemorrhage occurred in 16.9% of cases, highlighting the need for careful intrapartum monitoring and preparedness for hemorrhagic complications in pregnancies complicated by congenital Müllerian anomalies.

Cervical cerclage was required in 26% of patients, exceeding rates reported by Fox and Zhang but lower than Bhushan et al, likely reflecting both increased cervical incompetence and proactive obstetric management.

Short clinical vignettes

A unicornuate uterus case presented with PPROM at 29 weeks requiring emergency cesarean and NICU transfer (neonate surviving). A bicornuate uterus had recurrent third-trimester bleeding and underwent preterm cesarean at 33 weeks with PPH requiring uterotonics.

Limitations

The retrospective design and relatively small sample size are limitations of this study.

Table 4: Comparison of obstetric outcomes in pregnancies with congenital Müllerian anomalies across different studies.

Outcome	Present study (n=53)	Fox et al, 2013 (n=158)	Hua et al, 2011 (n=203)	Zhang et al, 2011 (n=116)	Bhushan et al, 2017 (n=21)
Most common uterine anomaly	Bicornuate (41.5%)	Septate (31.6%)	Bicornuate (49.5%)	Septate (37.1%)	Septate (23.8%)
Preterm birth (%)	56.6	41.2	40	20	44
Fetal growth restriction (%)	28.3	27.9	13	22.4	–
PPROM/PROM (%)	20.7	10.3	7	8.6	28
Malpresentation (%)	28.3	32.4	24	39	52
Placenta accreta (%)	18.8	8.8	5	4	–
Cervical cerclage (%)	26	7.6	–	7	46

CONCLUSION

Congenital Müllerian anomalies carry a high risk of adverse obstetric outcomes. Early recognition of congenital Müllerian anomalies allows closer antenatal surveillance and timely obstetric intervention, which may improve maternal and neonatal outcomes. Tertiary-care based antenatal monitoring, cervical length surveillance, and delivery preparedness for malpresentation and hemorrhage are essential in managing such pregnancies.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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