

# Reproductive and Neonatal Outcomes in Women with Unicornuate Uterus: A Population-based Study

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## INTRODUCTION

- Unicornuate uterus represents a congenital anomaly resulting from arrested development of one of the two Müllerian ducts during embryogenesis with a reported prevalence of approximately 0.03% to 0.1% and representing 5% to 20% of all Müllerian anomalies.
- Given the limited knowledge from published literature pertaining to fertility, pregnancy, and maternal and neonatal outcomes, the present study aims to use a population database to determine the association of unicornuate uterus with reproductive and neonatal outcomes

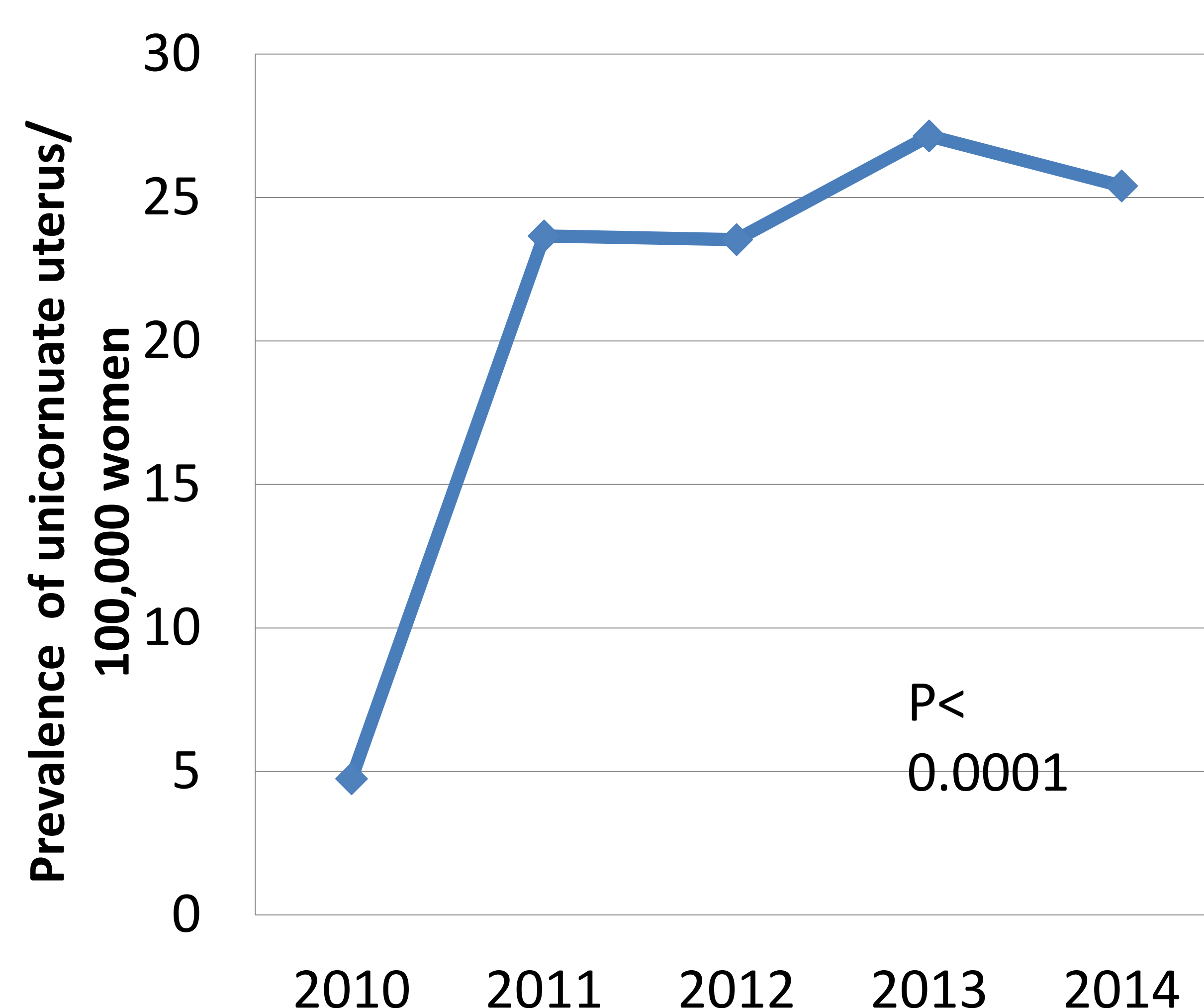
## OBJECTIVE

- To investigate reproductive and neonatal outcomes in women with unicornuate uterus

## MATERIALS AND METHODS

- Data from the Health Care Cost and Utilization Project-Nationwide Inpatient Sample database were extracted from 2010 through 2014 to create a delivery cohort using ICD-9 codes.
- Code 752.33 was used to identify cases with unicornuate uterus and reproductive outcomes were compared to pregnancies without unicornuate uterus.
- A multivariate logistic regression model was used to adjust for statistically significant variables (P-value <0.05).

Figure 1. Prevalence Unicornuate uterus among women who gave birth between 2010 and 2014



## RESULTS

- Among 3,850,226 deliveries during the study period, 802 women had unicornuate uterus. Patients with unicornuate uterus were more likely to be older (P <0.001), have thyroid disease (P <0.001), previous Caesarean section (P <0.001), and to have had in-vitro fertilization (IVF) (P <0.001).
- The risk of gestational diabetes, pregnancy induced hypertension, gestational hypertension and preeclampsia were significantly greater in the unicornuate uterus group relative to controls, after controlling for baseline risk factors; aOR 1.32 [95% CI 1.03 – 1.71], aOR 1.46 [95% CI 1.16 – 1.85], aOR 1.16 [95% CI 1.22- 2.28] and aOR 1.70 [95% CI 1.24- 2.32], respectively.
- Also, the rates of preterm delivery, preterm premature rupture of membranes and caesarean section were higher in the unicornuate uterus group compared to controls after controlling for confounding factors, aOR 3.83 (95% CI 3.19 – 4.6), aOR 5.11 (95% CI 3.73 – 7.14) and aOR 11.38 (95% CI 9.16 – 14.14) respectively.
- At birth, 11.1% and 2.6% of neonates were small for gestational age in the unicornuate uterus and the control groups, respectively, aOR 4.90, (95% CI 3.87 - 6.21).

TABLE I: Table 1 Maternal Characteristics

Characteristics	Unicornuate uterus N= 802	No unicornuate uterus N= 3 850 226	P-value
Age (years)			
<25	25.7	35.8	<0.0001
25-34	53.5	49.3	
≥35	20.8	14.9	
Race (Percentage)			
White	71.9	52.9	<0.0001
Black	5.0	14.6	
Hispanic	13.9	21.5	
Asian and Pacific	4.5	5.4	
Native American	0.1	0.8	
Other	4.6	4.8	
Income quartiles (Percentage)			
≤ \$39 000	18.1	27.7	<0.0001
\$39 000-47 999	24.7	25.0	
\$48 000-62 999	26.8	25.2	
≥\$63 000	30.4	22.1	
Plan type (Percentage)			
Medicare	0.5	0.7	<0.0001
Medicaid	30.5	43.9	
Private Insurance	64.0	49.8	
Self-pay	2.0	2.6	
No charge	0.2	0.1	
Other	2.7	2.9	
Obese(BMI>30) (Percentage)	5.7	5.5	0.80
Previous CS (Percentage)	38.3	17.1	<0.0001
Smoking during pregnancy (Percentage)	4.9	5.5	0.45
Chronic HTN (Percentage)	3.0	2.2	0.11
Pregestational DM (Percentage)	1.0	1.0	0.91
Thyroid disease (Percentage)	6.6	3.1	<0.0001
IVF (Percentage)	1.7	0.2	<0.0001
Multiple gestation (Percentage)	2.1	1.7	0.38

TABLE II: Pregnancy outcomes.

Pregnancy Outcomes <sup>a*</sup>	Unicornuate uterus	No unicornuate uterus	Crude OR (95% CI)	Adjusted OR (95% CI)	Adjusted p-value
HDP	11.3	8	1.467 (1.18 - 1.82)	1.462 (1.16 - 1.85)	0.002
Gestational hypertension	5.1	3.7	1.42 (1.04 - 1.95)	1.16 (1.22 - 2.28)	0.001
Preeclampsia	5.4	3.6	1.43 (1.05 - 1.95)	1.69 (1.24 - 2.32)	0.001
Preeclampsia/Eclampsia superimposed HTN	1.2	0.6	1.973 (1.06 - 3.68)	2.26 (1.21 - 4.22)	0.01
GDM	9.1	6.5	1.45 (1.139 - 1.84)	1.32 (1.03 - 1.70)	0.03

HDP- hypertensive disorders of pregnancy, HTN-hypertension, GDM- gestational diabetes mellitus.

a. Pregnancy outcomes: Adjusted for age, race, plan type, income quartiles, obesity, previous Caesarian section, chronic hypertension, thyroid disease and IVF.

\*Presented as Percentages

TABLE III: Delivery outcomes<sup>b</sup>

Delivery Outcomes <sup>b*</sup>	Unicornuate uterus	No unicornuate uterus	Crude OR (95% CI)	Adjusted OR (95% CI)	Adjusted p-value
PPROM	5.2	1.2	4.74 (3.47 - 6.47)	5.11 (3.73 - 7.14)	<0.0001
Preterm delivery	20.9	6.6	3.74 (3.16 - 4.44)	3.83 (3.19 - 4.60)	<0.0001
Spontaneous Vaginal Delivery	13.2	62.4	0.09 (0.07- 0.11)	0.10 (0.08 - 0.13)	<0.0001
Operative vaginal delivery	3.4	6.0	0.54 (0.37 - 0.80)	0.53 (0.36 - 0.80)	0.003
CS	85.4	32.9	11.93 (9.80 - 14.51)	11.61 (9.34 - 14.44)	<0.0001

PPROM-preterm premature rupture of membranes, CS-Caesarian section.

b. Delivery Outcomes: Adjusted for age, race, plan type, income quartiles, obesity, previous Caesarian section, chronic hypertension, thyroid disease, IVF, hypertensive disorders of pregnancy, gestational hypertension, preeclampsia, preeclampsia and eclampsia superimposed HTN and gestational diabetes.

\*Presented as Percentages

TABLE VI: Neonatal outcomes<sup>b</sup>

Neonatal Outcomes <sup>c*</sup>	Unicornuate uterus	No unicornuate uterus	Crude OR (95% CI)	Adjusted OR (95% CI)	Adjusted p-value
SGA	11.1	2.6	4.73 (3.79 - 5.89)	4.90 (3.87 - 6.21)	<0.0001
IUFD	0.1	0.4	0.30 (0.04 - 2.11)	0.38 (0.05 - 2.69)	0.33

c. Neonatal outcomes were adjusted for age, race, medical insurance plan type, income quartiles, obesity, previous Caesarian section, chronic hypertension, thyroid disease, IVF, hypertensive disorders of pregnancy, gestational hypertension, preeclampsia, preeclampsia/eclampsia superimposed hypertension and gestational diabetes.

\*Presented as Percentages

## CONCLUSIONS

- Women with unicornuate uterus are at higher risk for infertility, requiring more in-vitro fertilization, pregnancy complications, preterm delivery and having small for gestation age neonates. Women with known unicornuate uterus may benefit from increased surveillance to prevent and/or decrease maternal and neonate morbidity and mortality.

## Summary

- Women with a Unicornuate uterus require more surveillance prior to and during pregnancy given the increased risk of adverse maternal and neonate related outcomes.

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- Conflict of interest: All authors declare no conflict.