

Prenatal Exposure to Antiseizure Medications and Congenital Malformation Risk in Offspring: A Population-Based Study

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Background

- ✓ Antiseizure medications (ASMs) are frequently prescribed during pregnancy.
- ✓ Their potential teratogenic effects remain a significant concern.
- ✓ Understanding risks associated with ASM exposure (timing, type, number of medications) is critical for maternal and fetal health.

Objective

Evaluate the association between prenatal ASM exposure and the risk of congenital malformations, including:

- ✓ Major congenital malformations (MCMs)
- ✓ System specific malformations

METHODS

- Population-based cohort study using the Manitoba Research Data Repository (1998-2019).
- Statistical Analysis:
 - ✓ Generalized Estimating Equations (GEE) models adjusted for maternal age/heath and socioeconomic characteristics.

RESULTS

- ✓ 1.4% of pregnancies involved ASM exposure during pregnancy.
- ✓ MCM rates: Higher in ASM-exposed pregnancies: 5.8% (with maternal epilepsy), 4.4% (without) vs. 3.6% (unexposed).
- ✓ Lamotrigine (3%) and Levetiracetam (2.5%) appear to have lower risks compared to other ASMs.

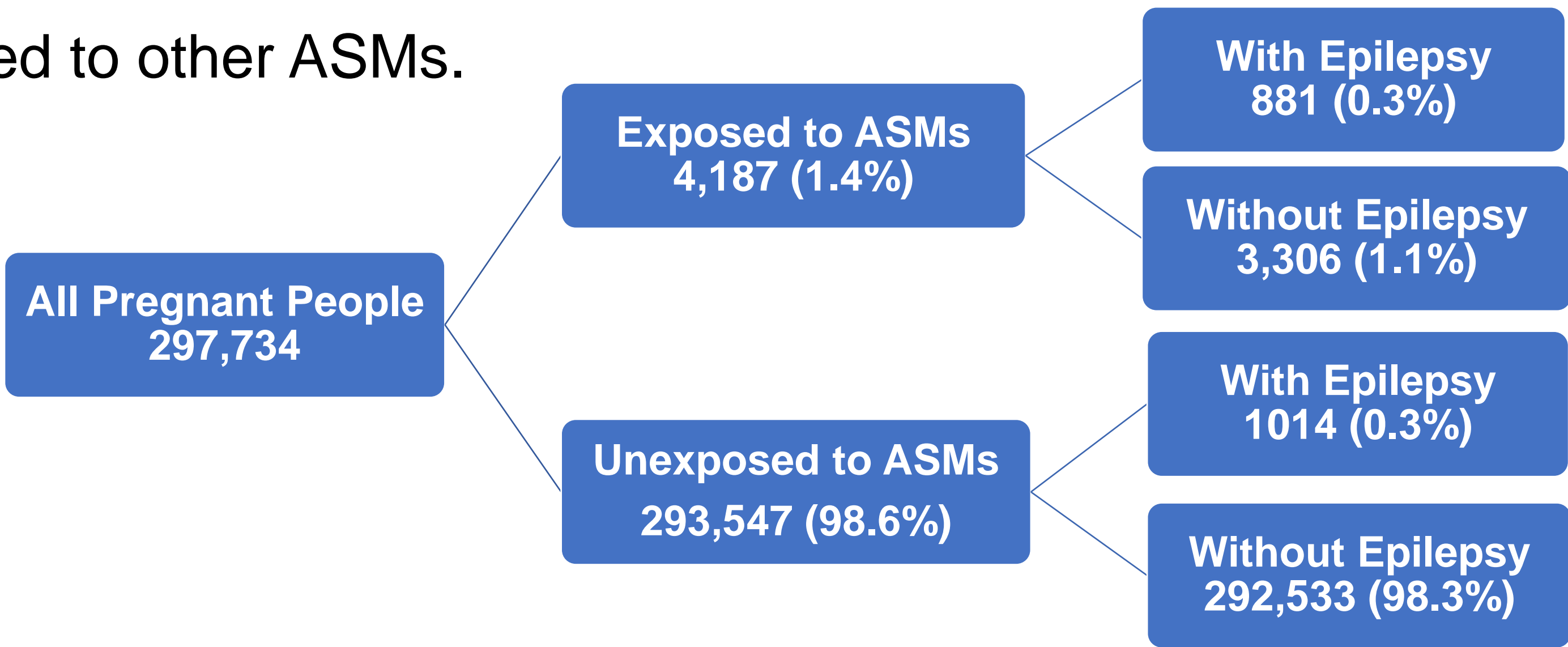


Figure 1. Distribution of Pregnant Individuals by Exposure to Antiseizure Medications and Epilepsy Diagnosis

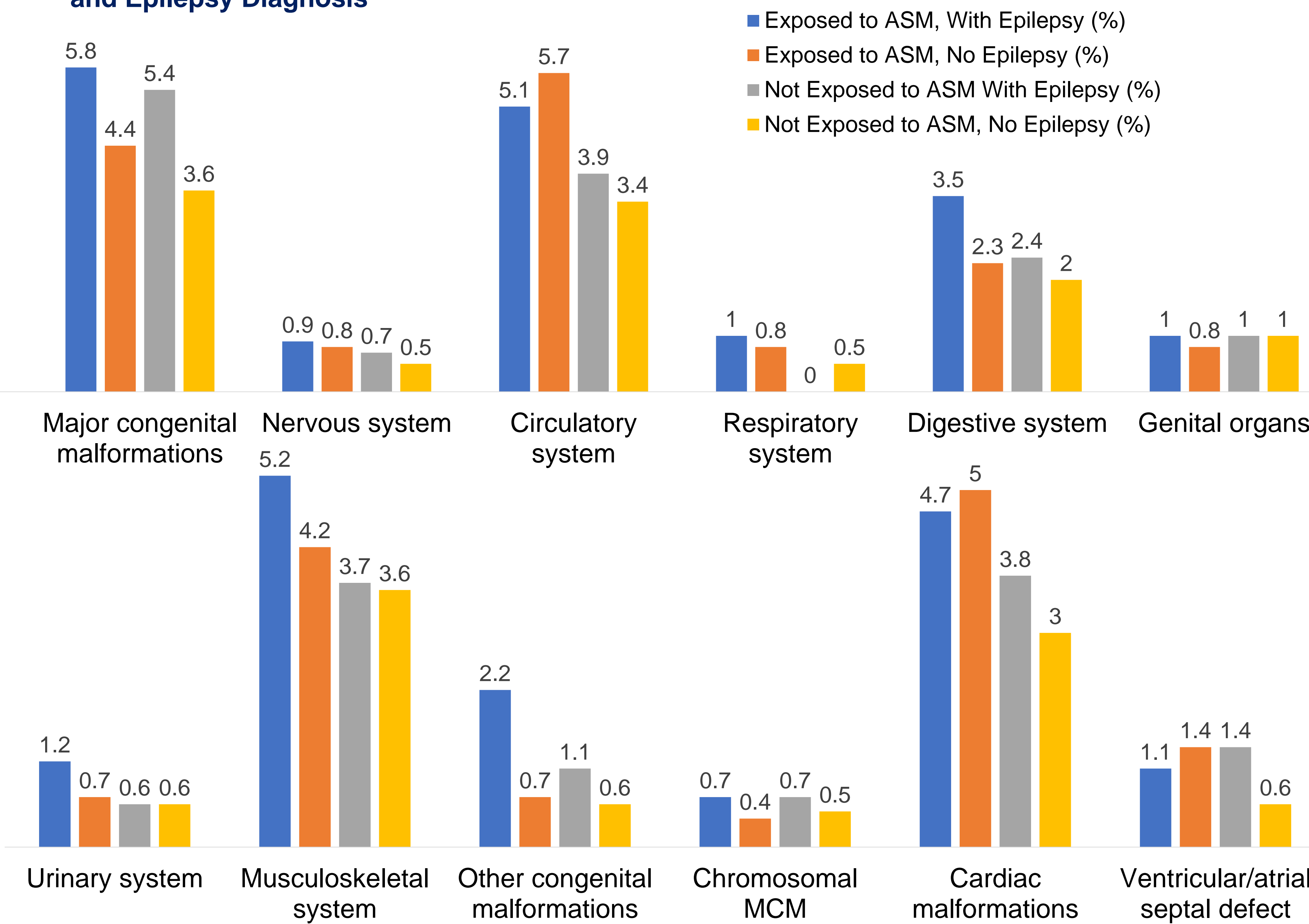


Figure 2. Percent of pregnant women with adverse infant birth outcomes by Epilepsy Diagnosis and ASM Exposure: Any Time during pregnancy

Table 1. Percentage of Major Malformations by generic drug name anytime during pregnancy

ASM	MCM (%)
Carbamazepine	5
Clonazepam	4.6
Gabapentin	4.8
Lamotrigine	3
Levetiracetam	2.5
Topiramate	4.4
Valproate	6

Table 2. Adjusted Odds Ratios (OR) for Congenital Malformations

Outcome	Exposed vs Unexposed (General)	Exposed Without Epilepsy vs Unexposed
Major Congenital Malformations	1.21 (1.02–1.43)	1.10 (0.91–1.34)
Nervous System	1.39 (0.95–2.04)	1.33 (0.86–2.06)
Eye/Ear/Face/Neck	0.85 (0.52–1.39)	0.56 (0.28–1.09)
Circulatory System	1.48 (1.27–1.73)	1.47 (1.25–1.74)
Respiratory System	1.46 (1.02–2.11)	1.40 (0.92–2.13)
Digestive System	1.15 (0.93–1.41)	1.03 (0.82–1.31)
Genital Organs	0.86 (0.59–1.25)	0.77 (0.50–1.18)
Urinary System	1.27 (0.86–1.88)	1.05 (0.67–1.66)
Musculoskeletal System	1.07 (0.91–1.27)	0.97 (0.80–1.17)
Cardiac Malformations	1.49 (1.27–1.75)	1.47 (1.23–1.75)
Ventricular/Atrial Septal Defect	1.84 (1.35–2.50)	1.96 (1.39–2.75)

Small sample size prohibited the model of PPWE for converging


CONCLUSION



ASM exposure during pregnancy is associated with increased risk cardiac malformations



Circulatory system defects significantly elevated across all exposure groups



First-trimester ASM exposure shows the high rates of multiple malformations

ACKNOWLEDGMENT