

Maternal-Fetal Environment and the Prevalence of Atrial Septal Defects in the Neonate

PURPOSE

- Characterize the Maternal-Fetal Environment for newborns with Atrial Septal Defect (ASD).
- Describe maternal and infant characteristics for newborns with ASD and compare to newborns without ASD from the same birth cohort.
- Investigate the association between preeclampsia and the prevalence of ASD in the newborn.

METHODS

The Copenhagen Baby Heart Study

- Prospective, population-based cohort study
- All expectant parents in the Capital Region of Denmark were offered inclusion prenatally (Apr. 2016-Oct. 2018)

Cohort for this substudy (n=11,959 newborns)

- Neonatal echocardiography within 30 days after birth analyzed for secundum ASD
- Exclusion of newborns with syndromes (n=6) or other cardiac abnormalities (n=432); and twins (n=342)

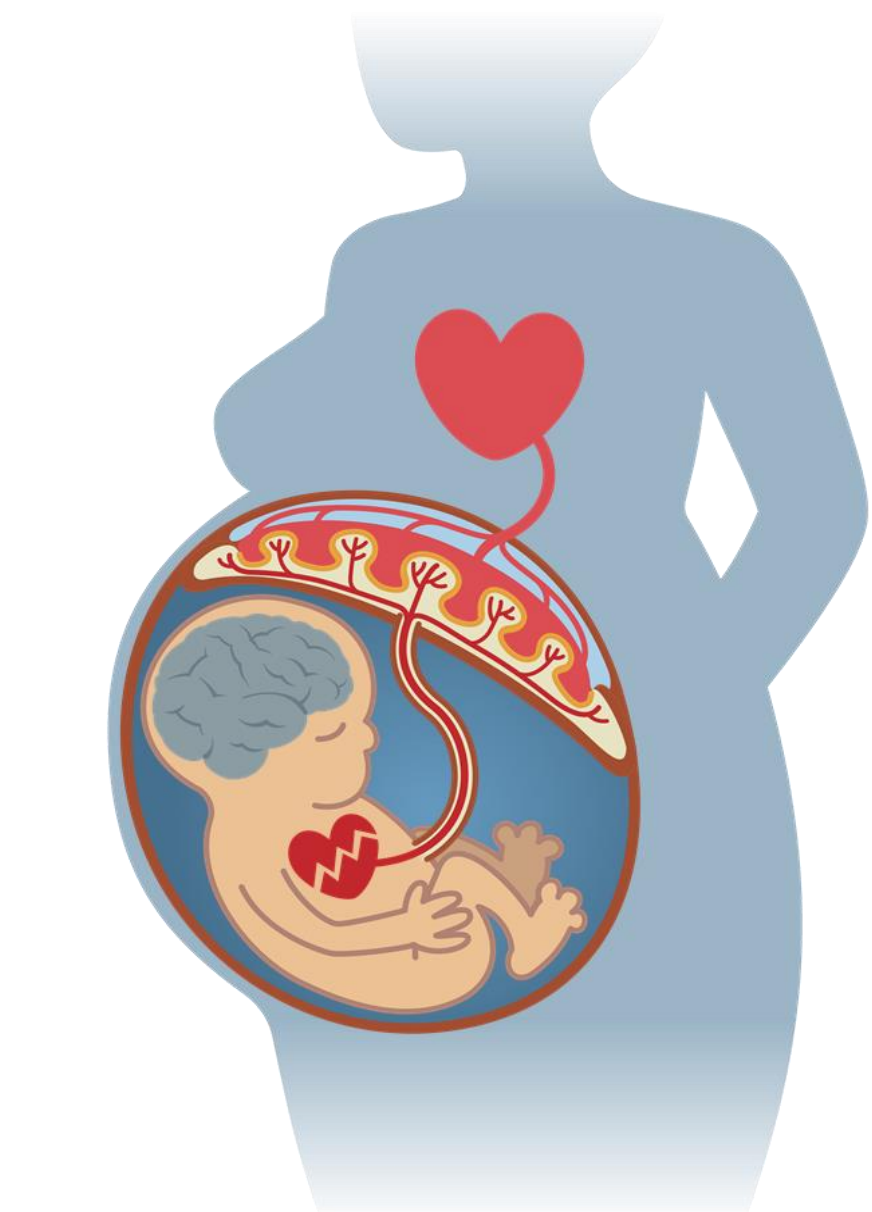
Outcomes

- Atrial septal defect for this study defined as an interatrial communication of >4mm in the oval fossa
- Preeclampsia defined by ICD-10 codes: O14.0-O14.2 or O15.0-O15.9

RESULTS

TABLE 1		ASD (n=465)	no ASD (n=11,494)
MATERNAL CHARACTERISTICS	Age at Delivery, Median [Min ,Max]	31 [19, 44]	31 [16, 51]
	Pre-pregnancy BMI, Mean (SD)	23.9 (4.6)	23.6 (4.4)
	Parity, n (%)		
	1	160 (34.4%)	3639 (31.7%)
	2	29 (6.2%)	954 (8.3%)
INFANT CHARACTERISTICS	3	8 (1.7%)	141 (1.2%)
	>3	1 (0.2%)	40 (0.3%)
	Gender, n (%)		
	Male	236 (51%)	6034 (52%)
	Female	229 (49%)	5460 (48%)
MATERNAL-FETAL ENVIRONMENT	Gestational Age at Birth (days), Median [Min, Max]	281 [234, 295]	281 [192, 298]
	Birth Weight (gram), Mean (SD)	3500 (493)	3520 (502)
	Birth Length (centimetres), Mean (SD)	51.5 (2.3)	51.7 (2.3)
	Small for Gestational Age, n (%)	39 (8.4%)	908 (7.9%)
	pH value after birth, Median [Min, Max]		
	Umbilical Artery	7.23 [6.95, 7.49]	7.23 [6.70, 7.57]
	Umbilical Vein	7.33 [7.01, 7.90]	7.32 [1.10, 8.27]
	Placental Weight (gram), Mean (SD)	636 (131)	642 (141)
	Placental Weight : Birth Weight-ratio, Mean (SD)	18.2 (2.9)	18.3 (3.3)
	PAPP-A, Median MoM	1.02	1.03
	Nuchal Translucency, Median MoM	1.81	1.80

TABLE 2	Preeclampsia (n=421)		No Preeclampsia (n = 11,503)	
	ASD	no ASD	ASD	no ASD
n (%)	25 (5.9%)	396	437 (3.8%)	11,066

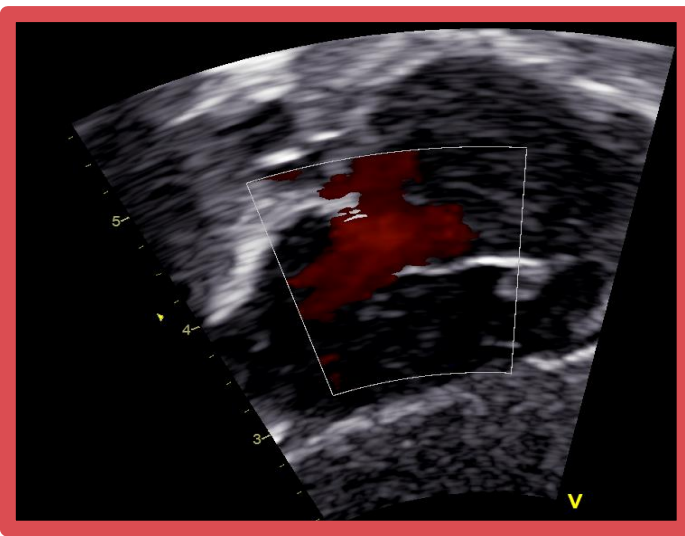


Risk ratio (RR) for ASD in newborns born after pregnancies with maternal preeclampsia compared to children born after pregnancies without preeclampsia:

RR 1.6 (95% CI 1.06-2.31, p=0.038)

CONCLUSION

- Maternal preeclampsia was associated with an increased prevalence of ASD in the newborn with a crude risk ratio of 1.6. Adjusting for maternal and infant characteristics did not change the results.



- There were no differences in maternal, infant or placental characteristics when comparing newborns with and without ASD.

Take-home message:
Preeclampsia is associated with an increased prevalence of Atrial Septal Defect in newborns.