UNIVERSITY OF BERGEN

Paternal cardiometabolic conditions and risk of perinatal death

Shwe Sin Win, Gerhard Sulo , Anders Engeland, Kari Klungsøyr

STIFTELSEN DAM

Landsforeningen uventet barnedød

Shwe Sin Win

25 September 2024

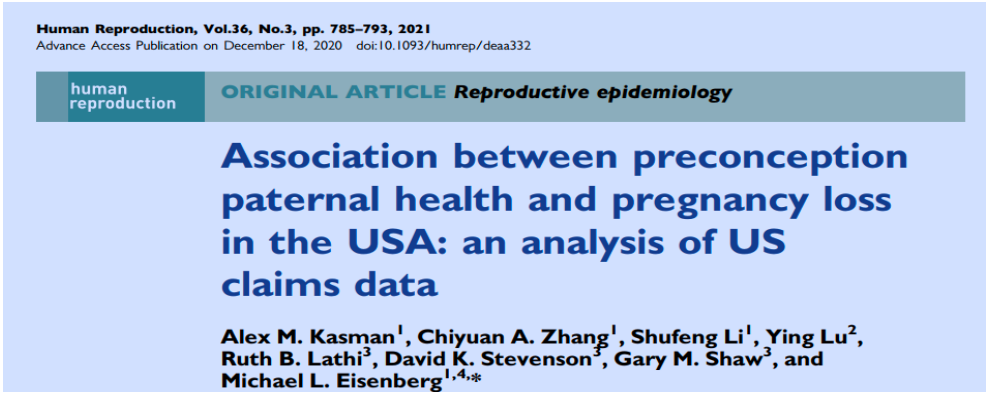
World Congress of Epidemiology

Background

Perinatal death

- Stillbirths + Deaths during 1st week of life per 1000 births
- Quality indicator
- Incidence 2021 (WHO)
  - Global : 13.9 (Stillbirth) + 18 (Neonatal Mortality)
  - EU : 5.4
  - Nordic countries : 2.5
  - Norway : 2.5

Background



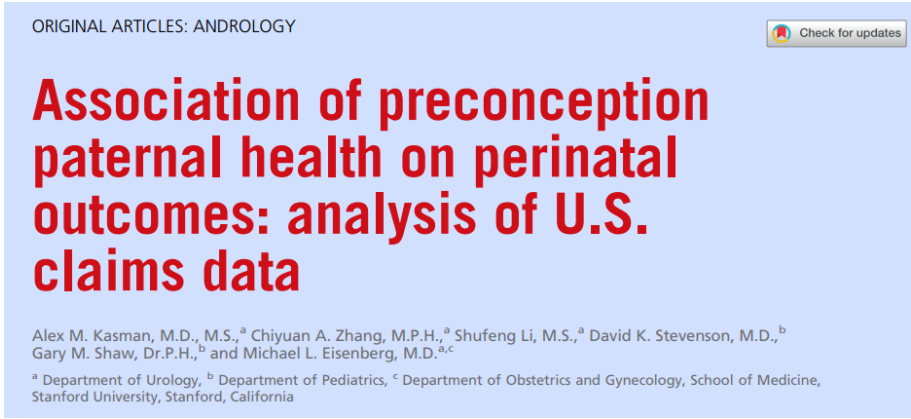
Human Reproduction, Vol.36, No.3, pp. 785–793, 2021
Advance Access Publication on December 18, 2020 doi:10.1093/humrep/deaa332

human reproduction

ORIGINAL ARTICLE *Reproductive epidemiology*

Association between preconception paternal health and pregnancy loss in the USA: an analysis of US claims data

Alex M. Kasman[1], Chiyuan A. Zhang[1], Shufeng Li[1], Ying Lu[2], Ruth B. Lathi[3], David K. Stevenson[3], Gary M. Shaw[3], and Michael L. Eisenberg[1,4,*]



ORIGINAL ARTICLES: ANDROLOGY

Check for updates

Association of preconception paternal health on perinatal outcomes: analysis of U.S. claims data

Alex M. Kasman, M.D., M.S.,[a] Chiyuan A. Zhang, M.P.H.,[a] Shufeng Li, M.S.,[a] David K. Stevenson, M.D.,[b] Gary M. Shaw, Dr.P.H.,[b] and Michael L. Eisenberg, M.D.[a,c]

[a] Department of Urology, [b] Department of Pediatrics, [c] Department of Obstetrics and Gynecology, School of Medicine, Stanford University, Stanford, California

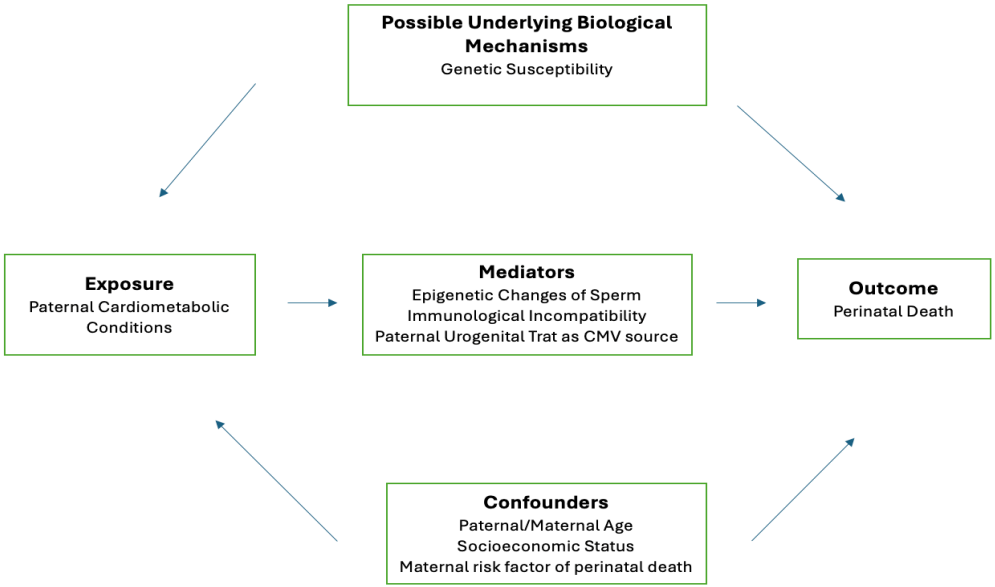
The risk of pregnancy losses increases by increasing numbers of cardiovascular risk factors in the fathers.

Fathers with cardiovascular risk factors had higher odds of having preterm births, low birth weight babies and longer neonatal intensive care unit stay

Aim

To explore the association between father's cardiometabolic conditions and offspring perinatal death using population-based, nationwide data from Norway, also taking account of maternal factors and fathers' socioeconomic level.

DAG


Possible Underlying Biological Mechanisms
Genetic Susceptibility
Exposure
Paternal Cardiometabolic Conditions
Mediators
Epigenetic Changes of Sperm
Immunological Incompatibility
Paternal Urogenital Trat as CMV source
Outcome
Perinatal Death
Confounders
Paternal/Maternal Age
Socioeconomic Status
Maternal risk factor of perinatal death

Methods: Data Sources

- Norwegian Patient Registry (2008)
- Norwegian Prescription Database (2004)

Exposure

- Medical Birth Registry of Norway (1967)

Outcome and Covariates

- National Education Registry
- Statistics Norway

Covariates

Methods: Exposure and Outcome

Exposure

- Hypertension
- Diabetes
- Dyslipidemia
- Severe obesity*
- Any of the above condition

Outcome

Perinatal death defined in our study as intrauterine foetal death from 16 weeks of pregnancy or neonatal death within the first month after birth

Methods: Statistics

Generalized linear models using log-binomial regression cluster by father's ID

Risk Ratios and 95% CI

Model 1: adjusted for birth year of child

Model 2: adjusted for birth year of child, father's and mother's age at first childbirth, father's education at 25 years, income at 30 years and marital status

Model 3: as model 2 and mother's pre- and gestational HTN, preeclampsia and pre- and gestational diabetes and smoking status during pregnancy (maternal risk factors for perinatal death)

Results

Figure 1. Number of babies born to fathers with cardiometabolic conditions

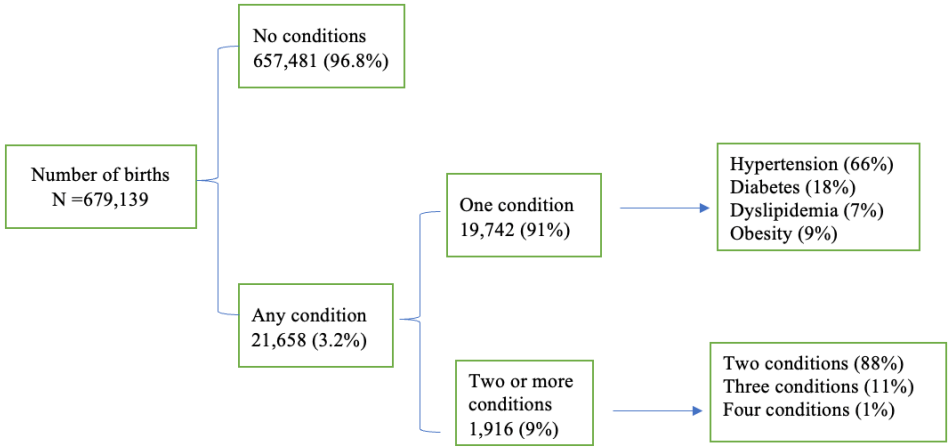
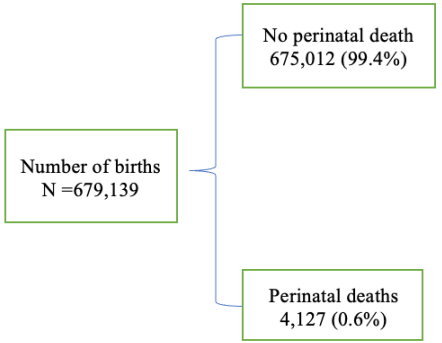


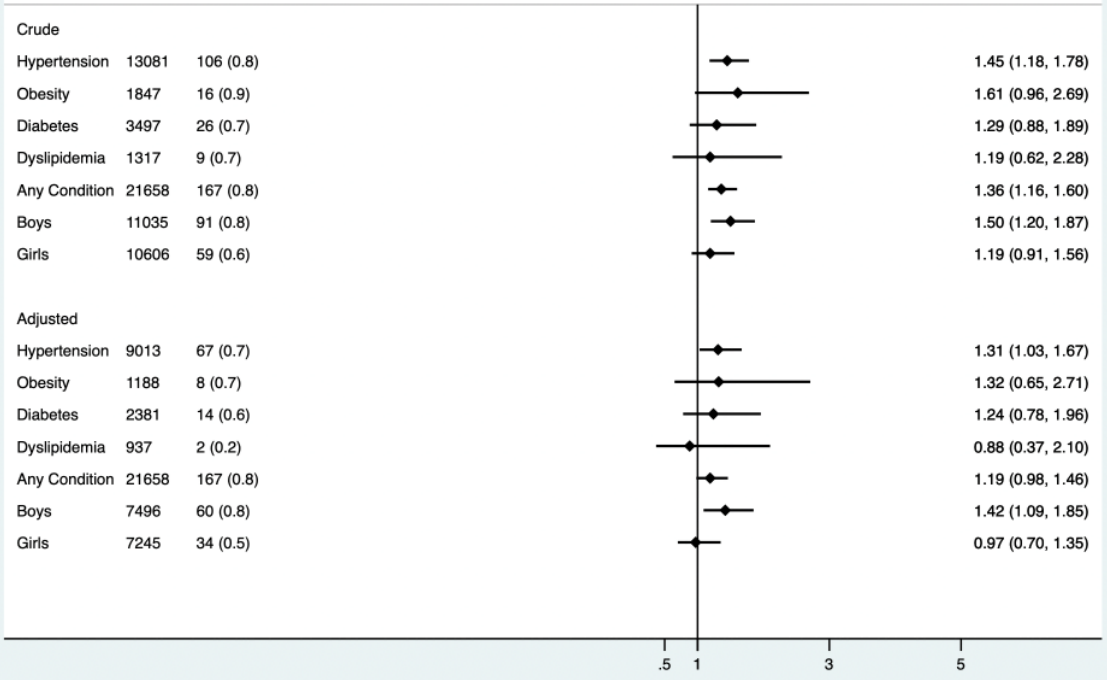
Figure 2. Number of perinatal deaths



Results

Perinatal Death by Father's Cardiometabolic Conditions Compared to No Condition

Conditions	Total_N	Death_percent	Risk Ratio (95% CI)
Crude			
Hypertension	13081	106 (0.8)	1.45 (1.18, 1.78)
Obesity	1847	16 (0.9)	1.61 (0.96, 2.69)
Diabetes	3497	26 (0.7)	1.29 (0.88, 1.89)
Dyslipidemia	1317	9 (0.7)	1.19 (0.62, 2.28)
Any Condition	21658	167 (0.8)	1.36 (1.16, 1.60)
Boys	11035	91 (0.8)	1.50 (1.20, 1.87)
Girls	10606	59 (0.6)	1.19 (0.91, 1.56)
Adjusted			
Hypertension	9013	67 (0.7)	1.31 (1.03, 1.67)
Obesity	1188	8 (0.7)	1.32 (0.65, 2.71)
Diabetes	2381	14 (0.6)	1.24 (0.78, 1.96)
Dyslipidemia	937	2 (0.2)	0.88 (0.37, 2.10)
Any Condition	21658	167 (0.8)	1.19 (0.98, 1.46)
Boys	7496	60 (0.8)	1.42 (1.09, 1.85)
Girls	7245	34 (0.5)	0.97 (0.70, 1.35)



Adjusted for Birth Year of Child, Parental's age, Social Status and Maternal Risk Factors for Perinatal Death

Conclusion

- Fathers with cardiometabolic conditions are at higher risk of experiencing perinatal death than fathers without such conditions independent of maternal risk factors.
- For specific conditions, paternal hypertension was associated with increased risk of perinatal death
- Associations were stronger if the sex of the offspring is boy.

uib.no