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ART AND CHILDHOOD MORBIDITY

Shikha Kuthiala PGY3

Assisted reproductive technology and childhood morbidity: a longitudinal cohort study

Shu Qin Wei, M.D., Ph.D.,^{a,b} Thuy Mai Luu, M.D.,^c Marianne Bilodeau-Bertrand, M.Sc.,^b and Nathalie Auger, M.D.^{b,d,e}

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How does ART impact offspring morbidity in the first decade of life

Research Question

August 23, 2022

Provincial data base collection in Quebec

Location

METHODS

Study Design and Population

Longitudinal cohort study of children
born from July 1 2008 to March 31,
2019

METHODS

Exposure

Conception **with ART** vs conception
without ART

METHODS

Outcomes

- Childhood hospitalizations up to 11 years of age
 - Infectious
 - Allergic
 - Malignant

METHODS

Outcomes

- Childhood hospitalizations up to 11 years of age
 - Cardiovascular
 - Respiratory
 - GI
 - Urogenital
 - MSK
 - CNS
 - Otologic
 - Ophthalmologic
 - Behavioral
 - Mental health

METHODS

Covariates

- Potential confounders
 - Maternal age
 - Parity
 - Maternal comorbidities
 - Tobacco, alcohol, substance use disorder
 - Low SES
 - Year of birth

METHODS

Statistics

- Hospitalizations per 100 person years and cumulative incidence at 11 years
- Cox proportional hazards regression models used to estimate HRs with 95% CIs for the association of ART with childhood hospitalization, adjusted confounders
- Discordant sibling analysis
 - Controls for genetic, environmental, or familial confounders

RESULTS



**797,654 singleton
children and
4,837,936 person
years of follow-up**



**16,626 (2.1%)
children were
conceived by ART**



**198,489 children were
hospitalized, 2.1%
children conceived by
ART**

Hospitalizations were higher for children conceived by ART but similar cumulative incidence of hospitalization at 11 years

RESULTS

● INFECTION

1.25X risk of infectious hospital admission

● ALLERGY

1.25X risk of allergy hospitalization

● CANCER

Risk **not** elevated

RESPIRATORY ●

1.21X risk of respiratory admission

GI ○

1.27 X risk of GI admission

OPHTHO ○

1.22X risk of ophthalmologic admission

RESULTS

● OTOLOGIC

1.35X risk of otologic hospital admission

● BEHAVOIRAL

1.35X risk of behavioral hospital admission

● MENTAL

1.35X risk of mental health hospital admission

METABOLIC ●

Risk **not** elevated

URINARY ○

Risk **not** elevated

OTHER ○

Risk **not** elevated

RESULTS

● OTITIS MEDIA

1.36 X risk of OM hospital admission

● PNEUMONIA

1.26X risk of PNA hospital admission

● INTestinal INFECTION

1.30X risk of GI infection admission

ASTHMA ●

1.27X risk of asthma admission

PULMONARY VASC DISEASE ○

2.16X risk of PVD admission

RESULTS

01

GENERAL HOSPITALIZATION

1.25X the risk prior to 2years

1.23X the risk from 2-4 years

0.82X the risk from 5-11 years

02

OTHER

Respiratory and otologic hospitalizations were decreased after 5 years

Allergy and GI hospitalizations were decreased after 2 years

RESULTS

When compared with discordant sibling:

- ART was not associated with overall greater risk of hospitalization (HR 0.92)
- ID (HR 0.94), respiratory (1.07) and GI (1.58) hospitalizations were not increased
- Mothers of discordant children were *younger, with less comorbidities than the whole cohort*

Discussion



- 797, 654 singletons followed from birth to 11 years
- Children conceived by ART had greater risk of hospitalization than those without
 - *OM, PNA, asthma, PVD*



- When siblings are used as control ART was **not** associated with elevated hospitalizations

PREVIOUS RESEARCH

Cohort study from Massachusetts (2021) found that children of women with subfertility or conceived via ART required more hospital based care in the first 4 years of life

PREVIOUS RESEARCH

Population based cohort study from Israel (2019) found that children of women had increased risk of infectious morbidity

PREVIOUS RESEARCH

Cohort study from the UK (2013) found that ART was associated with childhood asthma but thought this was due to parental infertility

CURRENT STUDY

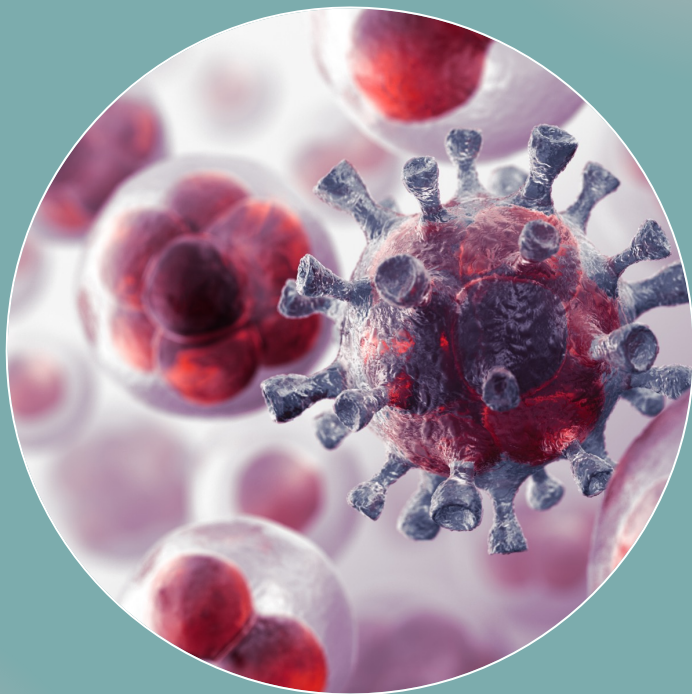
- ART is associated with increased hospitalization for infection and allergy, however may be confounded by familial risk factors
- Children conceived by ART had higher risk of PVD, however, cases were low and not associated with CVD or metabolic outcomes

DISCUSSION

Conflicting data in previous studies

- Neurodevelopment: some studies have found an association with CP, ASD, developmental delay with ART conceived children while others have found no increased risk compared to natural conception
- Respiratory/GI: one study found that subfertility was associated with resp and GI conditions, whereas others have found no association

The results of this study find no association between ART and hospitalization for neurological, respiratory, GI or MSK disorders when corrected for genetic, environmental and familial factors



ART + CANCER

No association between ART and childhood cancer seen in this study

Previous Danish study looking at FET found HR 2.34 for childhood cancer

Limitations

01

Selection bias

02

Exaggerated effects

03

Random error

04

Universal health care

05

Inpatient vs
outpatient

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CONCLUSION

No evidence of increased childhood morbidity
in children conceived with ART when matched to sibling
controls