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THE ASSOCIATION BETWEEN MODE OF BIRTH DELIVERY AND ATTENTION DEFICIT-HYPERACTIVITY DISORDER: A SYSTEMATIC REVIEW PROTOCOL OF EPIDEMIOLOGICAL EVIDENCE

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Disclosures

- > I have an affiliation with the following organisations that could be perceived as a direct or indirect conflict of interest in the context or content of this presentation.
 - Deputy Director of the Czech CEBHC Joanna Briggs Collaboration
 - Deputy Director of Masaryk University GRADE centre
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OBJECTIVE

To synthesize the best available evidence regarding the epidemiological association between the mode of delivery (CS versus vaginal delivery) as exposure and ADHD as the outcome.

BACKGROUND

Caesarean section (CS)

- the most frequently performed intervention in obstetrics
- one of the most common abdominal operation at all
- rates of CS have been rising globally
- in Czech Republic – 2014 - incidence reached 26.1%

BACKGROUND

Attention-deficit/hyperactivity disorder (ADHD)

- the most common neurobehavioral disorder in children
- characterized by combination of symptoms including inattention, impulsivity and hyperactivity
- the incidence is increasing
- the worldwide prevalence of ADHD - about 7.2%

BACKGROUND

Perinatal factors that increase the risk of ADHD:

- premature birth,
- maternal hypothyroidism,
- smoking during pregnancy,
- prenatal exposure to alcohol and cigarettes.

BACKGROUND

CS may affect psychological development through changes in microbiota or stress response and birth by CS can be associated with a small increased risk of ADHD. ¹

X

On the contrary, there is also evidence of no association between mode of delivery and the risk of developing ADHD. ²

1. Curran EA, Khashan AS, Dalman C, Kenny LC, Cryan JF, Dinan TG, et al. Obstetric mode of delivery and attention-deficit/hyperactivity disorder: a sibling-matched study. *Int J Epidemiol.* 2016 Apr;45(2):532-42.

2. Curran EA, Cryan JF, Kenny LC, Dinan TG, Kearney PM, Khashan AS. Obstetrical Mode of Delivery and Childhood Behavior and Psychological Development in a British Cohort. *J Autism Dev Disord.* 2016 Feb;46(2):603-14.

METHODS

Protocol of SR



PROTOCOL

- according to the **PRISMA-P statement** and the **Joanna Briggs Institute (JBI)** methodology for systematic reviews of etiology and risk
- enrolled with the **PROSPERO** prospective register of systematic reviews.

Inclusion criteria

Population

- Children
 - Subgroup comparison for different children's conditions - ***birth hypoxia, hypoxic-ischemic encephalopathy, congenital malformations*** of the central nervous system.
 - Subgroup analysis for children after ***preterm, in term*** and ***post term delivery***.

Inclusion criteria

Exposure

- **Caesarean section** compared to **vaginal delivery**
 - Subgroup comparison **for caesarean section**: emergency and elective caesarean section
 - Subgroup comparison **for vaginal delivery**: *head fetal presentation, other fetal presentations (breech, etc.), instrumental vaginal delivery (VEX, Forceps), induced labor.*

Inclusion criteria

Outcome

- **Presence (or absence) of Attention Deficit-Hyperactivity Disorder (ADHD)**

Study design

Analytical epidemiological study designs including:

- *prospective* and *retrospective cohort studies*,
 - *case-control studies*,
 - *analytical cross-sectional studies*.
- in all languages
 - without date limitations

SEARCH STRATEGY

- **published and unpublished studies**

- **three-step search strategy**

- Ovid MEDLINE(R) 1946 to current, CINAHL® Plus with Full Text 1935 to current, Embase (1974 to current), Web of Science, Nursing Ovid, Scopus, PsycINFO, Tripdatabase
- Int J Occup Med Environ Health, Pediatrics, J Am Acad Child Adolesc Psychiatry, J Autism Dev Disord
- Cos Conference Papers Index, Grey Literature Report, Mednar, dissertation theses (ProQuest), Informit Health databases, www.ADHD.dk (The Danish ADHD Society), www.adhdnorge.no (The Norwegian ADHD Society), www.attention-riks.se (The Swedish ADHD Society), www.adhdeuroe.net (ADHD Europe), www.psych.org (The American Psychiatric Association)

STUDY SELECTION

- **two reviewers** will independently screen and select studies for possible inclusion
- ***first phase*** - titles and abstracts will be analysed
- ***second phase*** - all possible relevant full texts will be analysed

ASSESSMENT OF METHODOLOGICAL QUALITY

- two independent reviewers for methodological quality
- using standardised critical appraisal instruments developed by JBI

DATA EXTRACTION

- using the standardized data extraction instrument JBI SUMARI by two independent reviewers
- the extracted data will include specific details about the exposure of interest including:
 - ***different exposure categories,***
 - ***populations,***
 - ***study methods,***
 - ***outcomes or dependent variables*** of significance to the review question and specific objectives.

DATA SYNTHESIS

- statistical meta-analysis using JBI SUMARI
- either odds ratios
- relative risk (for dichotomous data)
- 95% confidence intervals
- using the standard chi-squared and I squared tests

ASSESSING CONFIDENCE

- A 'summary of findings' table - using GRADEPro GDT software
- absolute risks for treatment and control,
- estimates of relative risk,
- a ranking of the quality of the evidence based on study limitations (risk of bias), indirectness, inconsistency, imprecision and publication bias

Thank you for your attention

