



Nicotine exposure

Maternal smoking & risk of

ADHD in children

By Rhma Khaled Ro.n: 3472 First year Block GBMS 2 18/5/2022





Objectives

Discuss the main mechanism of action of nicotine.

Outline the effect of nicotine on the fetus.

3 What is ADHD.

How does maternal smoking increase the risk of ADHD in children.



Goals





Eradicating nicotine exposure

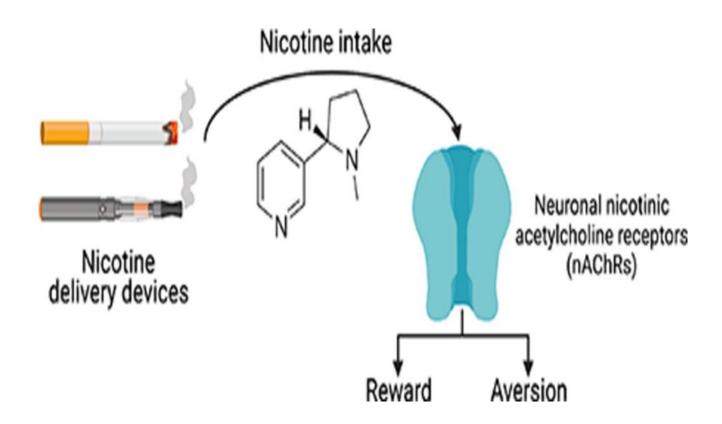




Healthy pregnancy

Mechanism of nicotine action

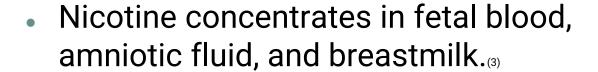
- Nicotine is a plant alkaloid, found in the tobacco plant, and addictive central nervous system (CNS).
- Nicotine mainly shows its action through specific nicotinic acetylcholine receptors located in brain.

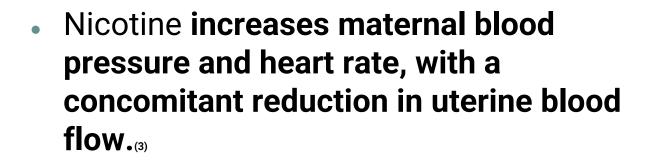


Effect of nicotine on fetus



Effect of nicotine on fetus







Maternal Cigarette Smoking

Nicotine in Fetus

Effects on Fetal Brain General Development

Perinatal Morbidity/Mortality
Growth Retardation
Behavioral Anomalies

Maternal-Fetal Unit

Hypoxia/Ischemia CO, HCN Anorexia

Risky Behaviors:
Other drugs/alcohol
Prenatal Care
Socioeconomic

What is ADHD



What is ADHD

- (ADHD) is Attention-deficit/hyperactivity disorder.
- Is one of the most common mental disorders affecting children.
- Is often first identified in school-aged children when it leads to disruption in the classroom or problems with schoolwork.

Difficulty in keeping concentration and paying attention in tasks or play activities

Often does not seem to listen when spoken to directly

> Struggles to follow through with instructions

> > Difficulty in organising tasks and activities

Avoids, dislikes, or is reluctant to engage in tasks that require a sustained mental effort (such as school work or homework)



Inattention

Fails to give close attention to details or make careless mistakes

> Easily distracted by things going on around them

> > "Loses" things e.g. toys, school books, pencils

Forgetful in daily activities



From: Prenatal Cotinine Levels and ADHD Among Offspring

Source Population All singleton live births in Finland between 1991 and 2005 (N = 870 695) (Statistics Finland) **Identification of Patients** Patients with ADHD cases in inpatient (January 1995-December 2011) and public outpatient units (January 1998-December 2010) (FHDR). Patients with deep or profound mental retardation an ADHD diagnosis only before age 2 years were excluded (n = 10409)**Identification of Controls** Controls were matched 4:1 to each patient on date of birth, sex, and living in Finland on date of diagnosis of matched case (1995-2011). Controls with deep or profound mental retardation or conduct disorder were excluded. (PRC) (n = 39125)Identification of patients with ADHD (ICD code F90) born between 1998 and 1999 (n = 1320) **Maternal Serum Cotinine** Sufficient serum samples available for 1079 patients and 1:1 matched controls (n = 1079) (FMC) Covariates Maternal age, maternal SES, number of previous births, offspring gestation age (FMBR), parental psychiatric diagnoses (FHDR), paternal age (PRC), and gestational week of blood draw (FMC)



Conclusions



"The higher the nicotine levels were in the mother's blood during pregnancy, the greater was the child's risk of developing (ADHD) later in life"



References

- (1). National Center for Biotechnology Information. PubChem Compound Summary for CID 89594, Nicotine. https://pubchem.ncbi.nlm.nih.gov/compound/Nicotine. Accessed May 17, 2022.
- (2). Tiwari RK, Sharma V, Pandey RK, Shukla SS. Nicotine Addiction: Neurobiology and Mechanism. *J Pharmacopuncture*. 2020;23(1):1-7. doi:10.3831/KPI.2020.23.001
- (3). Lambers DS, Clark KE. The maternal and fetal physiologic effects of nicotine. *Semin Perinatol.* 1996;20(2):115-126. doi:10.1016/s0146-0005(96)80079-6.
- (4). https://www.psychiatry.org/patients-families/adhd/what-is-adhd. Published 2022. Accessed May 17, 2022.
- (5). Sourander A, Sucksdorff M, Chudal R et al. Prenatal Cotinine Levels and ADHD Among Offspring. *Pediatrics*. 2019;143(3). doi:10.1542/peds.2018-3144



Thank you!

Does any one have a Question?