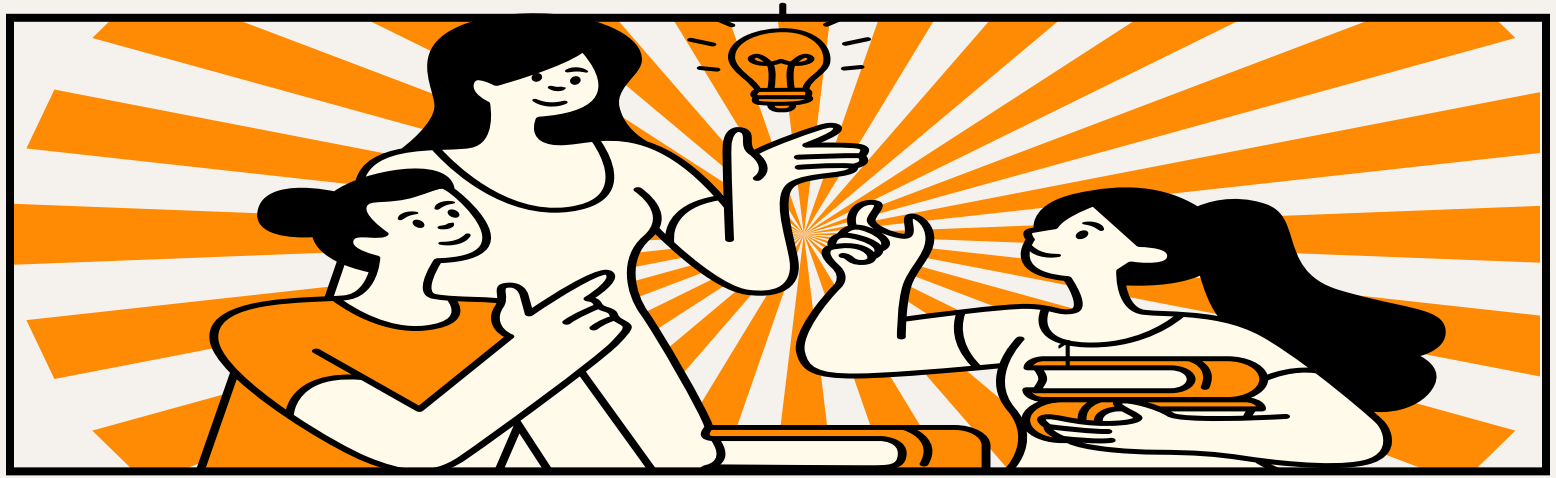
JOURNAL CLUB

02

TOGETHER, WE CAN LEARN FROM EACH OTHER



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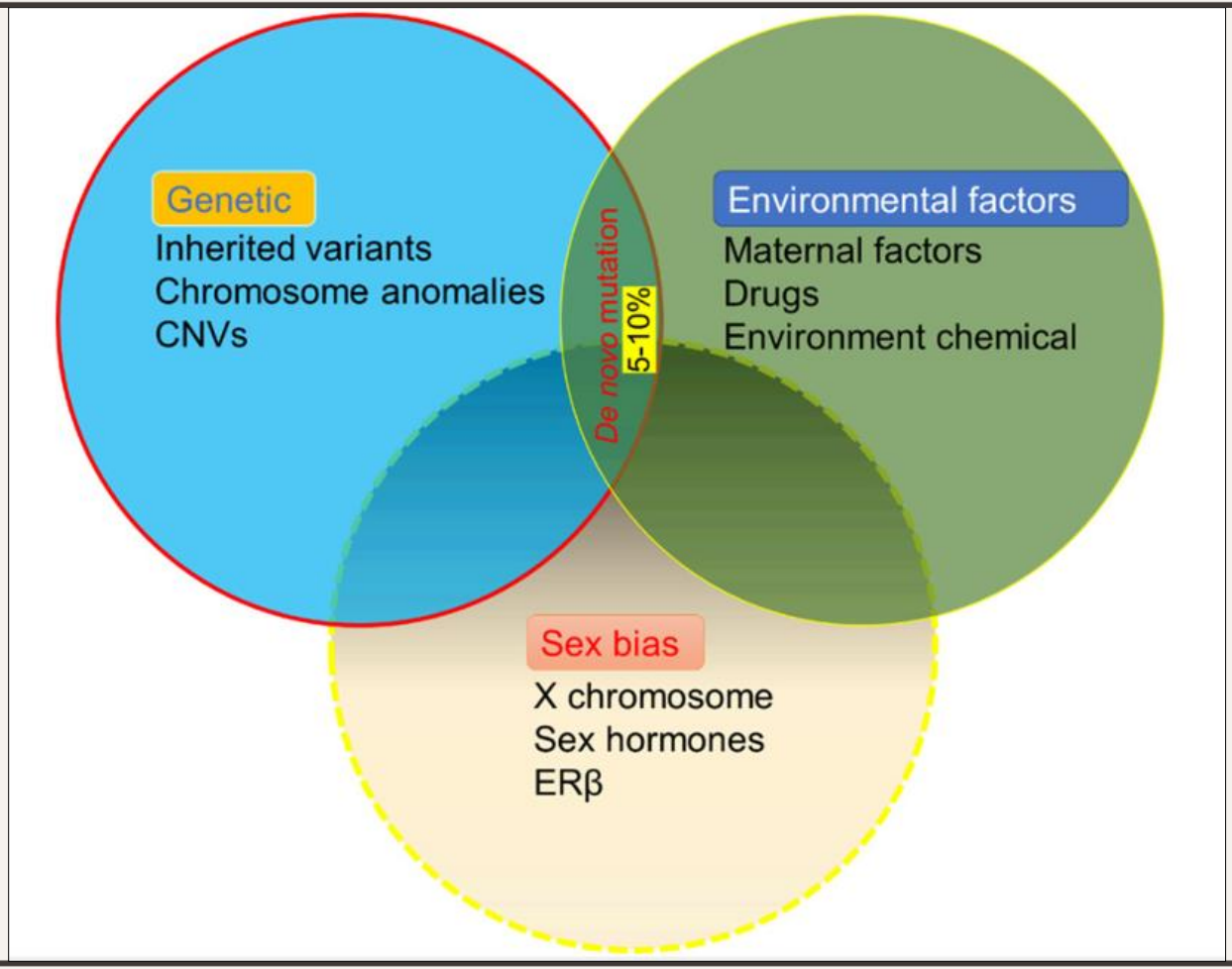
The Impact of Maternal Risk Factors on ASD Development

Exploring the connections between maternal conditions and autism spectrum disorders.

Introduction

Autism Spectrum Disorders (ASD) have seen a dramatic increase in prevalence.

This presentation aims to elucidate how maternal conditions and other factors impact the risk of ASD in offspring.


Genetic
Inherited variants
Chromosome anomalies
CNVs
De novo mutation
5-10%
Environmental factors
Maternal factors
Drugs
Environment chemical
Sex bias
X chromosome
Sex hormones
ERβ

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Maternal Diabetes and ASD Risk

Maternal diabetes includes type 1, type 2, and gestational diabetes (GDM) associated with a higher risk of autism in offspring.

Epidemiological studies suggest diabetes affects up to 15% of pregnant women globally.

Mechanisms of Maternal Diabetes Affecting ASD

Hyperglycemia during pregnancy can lead to permanent fetal brain changes.

Diabetes-related oxidative stress may impair normal neurodevelopment.

Maternal obesity and metabolic disorders linked to abnormal neurobehavioral development in children.

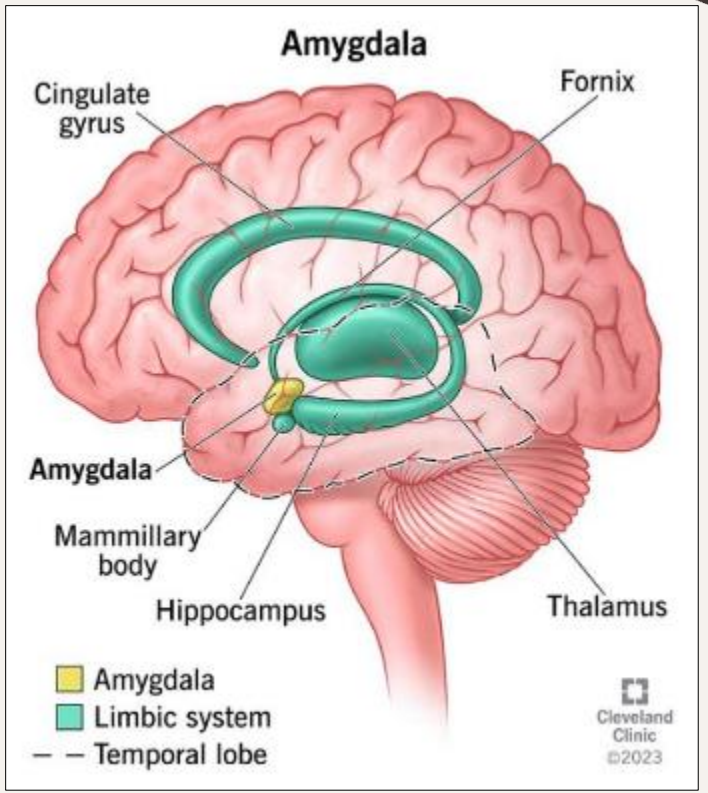


Table 1. The contributions of the environmental factors to ASD development

Environmental factors	Odds ratio [OR]/Hazard ratios (HR)/Confidence interval [CI]	Increased risk for ASD	Reference
Obesity	OR 1.36, 95% CI 1.08-1.70	36%	[16]
Maternal diabetes	OR 1.48, 95% CI 1.26-1.75	62%	[9]
Maternal gestational diabetes mellitus	OR 1.63, 95% CI 1.35-1.97	42%	[9]
Polycystic ovary syndrome (POS)	OR 1.59, CI 95% 1.34-1.88	59%	[17, 18]
Maternal antidepressant (selective serotonin reuptake inhibitors)	HR 2.17; 95% CI, 1.20-3.93	N/D	[19]
Maternal depression	HR 1.75; 95% CI, 1.03-2.97	87%	[20]
Maternal hypertension	OR 1.35, 95% CI 1.11-1.64	35%	[20]
Maternal infection	OR 1.13, 95% CI=1.03-1.23	30%	[21]
Maternal dichlorodiphenyl dichloroethylene (p,p'-DDE) exposure	OR 2.21, 95% CI 1.32-3.69	N/D	[22]
Prenatal exposure to organophosphate (dialkyl phosphates)	OR 2.0, 95% CI 1.1-3.6	60%	[23]
In vitro fertilization	OR 1.14, 95% CI 0.94-1.39	N/D	[24]

Chemical Exposure as a Risk Factor

Xenobiotic exposures, such as pesticides and metals, associated with increased autism risk.

Animal models show chemical exposure alters neuronal development.

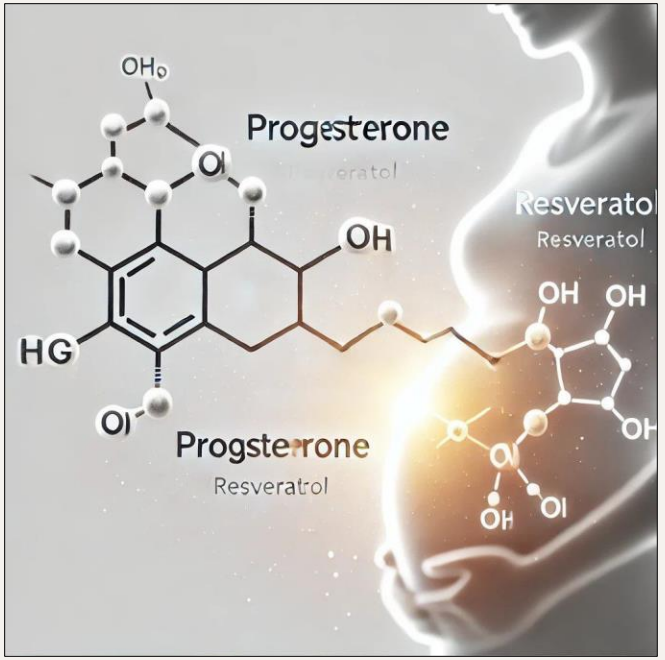
Research on pregnant mice exposed to glyphosate shows increased autistic-like behaviors in offspring.

Hormonal Influences on Autism Development

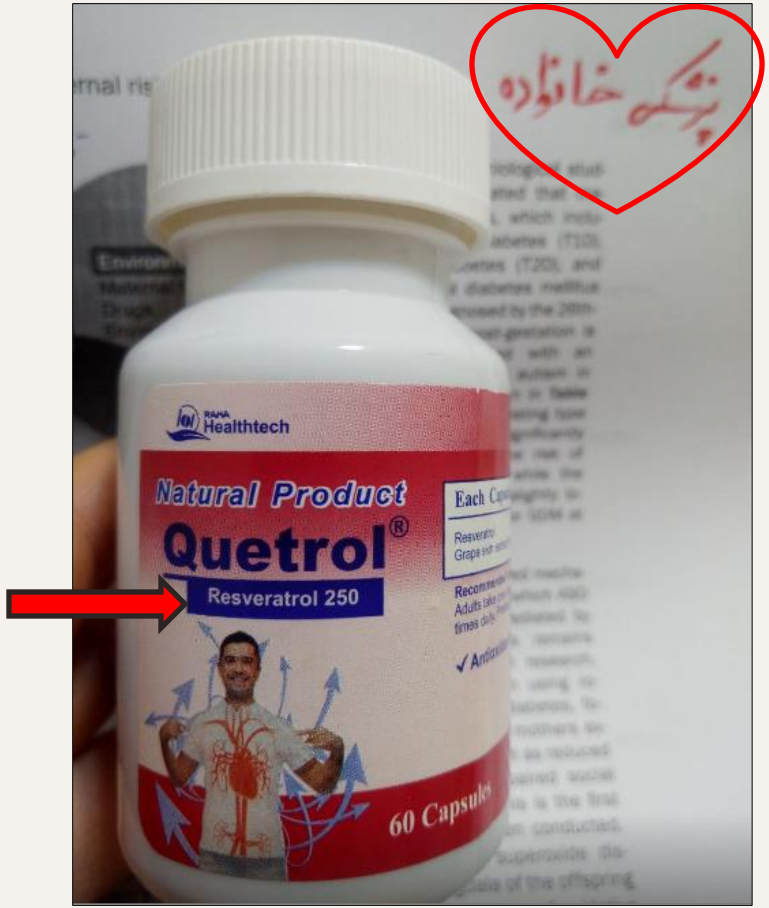
Imbalances in sex hormones during pregnancy may contribute to ASD.

Exposure to synthetic progestin linked to higher rates of autism.

The expressions of ERβ and its co-factors are significantly suppressed in the brains of autistic patients.



Further research found that autism-like behaviors induced by prenatal progesterone exposure were rescued through treatment with resveratrol, a drug that activates ERβ.



Gender Differences in ASD Manifestation

ASD prevalence is significantly higher in males than females.

Symptoms may differ based on gender, with males exhibiting more external behaviors.

Investigating how sex hormones might influence autism development.

Genetic and Environmental Interactions

Research indicates that gene-environment interactions are essential to understanding ASD.

Epigenetic changes from environmental exposures may lead to risk of ASD.

Challenge remains in determining the best prevention and intervention strategies.

Conclusion

Understanding the multifactorial nature of ASD is crucial for developing effective diagnosis and treatment strategies. Maternal health factors, including diabetes and hormonal changes, play a significant role in the risk for autism, highlighting the need for focused public health interventions.

Together, we can reduce risks and ensure healthier future for generations to come.

Thank you!

Do you have any questions?

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