

2022 Best Research Poster Award

The impact of the maternal and infant gut microbiome on the risk of autism spectrum disorder

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INTRODUCTION

Autism spectrum disorder (ASD) is one of the fastest growing neurodevelopmental disorders globally, with current prevalence estimates suggesting 1 in 100 individuals have ASD globally¹.

In mice, altered maternal microbiota during pregnancy leads to neurodevelopmental changes in the offspring². Gut bacteria may also induce immune responses increasing the risk of autism-like behaviour³.

In humans, increased maternal gut microbiota diversity during pregnancy was associated with decreased internalising behaviours in children⁴. Reduced *Prevotella* abundance in faecal samples of one-year-old infants was associated with increased internalising problem scores at two years of age⁵, a common behavioural characteristic of ASD.

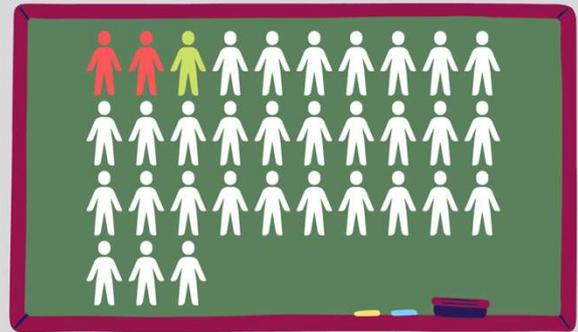
Currently there is a lack of human evidence describing the relationship between the gut microbiome during pregnancy, early life and ASD outcomes.

OBJECTIVES

- To estimate the incidence and characterize the presentation and severity of clinically diagnosed ASD within the Barwon Infant Study cohort.
- To investigate how the prenatal gut microbiome at 36 weeks gestation and infant gut microbiome at 12 months of age relate to ASD neurodevelopment.

RESULTS

In a classroom of 33 children, two children will have been diagnosed with ASD and one will be under investigation.



DISCUSSION

Approximately 9% of participants within the BIS cohort have a parent reported diagnosis of ASD, which is considerably higher than current global estimates. We will clinically validate these parent-reported diagnoses of ASD by confirming they were made by a paediatrician or child psychiatrist in accordance with the National Guideline for the Assessment and Diagnosis of ASDs⁶. Given the depth of environmental data and biological samples assembled in BIS during pregnancy, infancy and early childhood, we have a unique opportunity to identify modifiable targets for ASD prevention.

CONCLUSION

We found a high rate of parent reported ASD. Once validated, we will identify at-risk and protective microbiome characteristics which may provide novel, modifiable targets and future strategies for primary and secondary prevention of ASD.

METHOD

STUDY DESIGN & RECRUITMENT

Barwon Infant Study
Study design: Longitudinal birth cohort study
Mothers: 1064
Infants: 1074
From the Barwon region

2010-2013

HEALTH SCREEN

868/1074 (80.2%) responders.
80 children had parent reported a diagnosis or under investigation for ASD.

2020-2021

ASD VALIDATION

Clinically validate ASD diagnoses by accessing participant medical records. Confirm diagnosis was made by paediatrician or child psychiatrist.

2022

METAGENOMICS

Sequencing is underway on 4,400 faecal samples to characterize the maternal and infant gut microbiota profile.

2023

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