



Sleep difficulties in children on the autism spectrum



Background

Sleep is now recognised as a fundamental factor contributing to the quality of life of autistic people, estimated to affect 50-80% of people. By understanding the biological and behavioural attributes of sleep difficulties as a comorbidity in children on the autism spectrum, we can provide the right supports to improve quality of life.



Aim

The project aimed to:

1. define the sleep difficulties in children on the autism spectrum
2. comprehensively evaluate the relationship between sleep difficulties and clinical phenotype (physical makeup of a person) including autism traits, cognitive level, gender, adaptive behaviour and sensory profile
3. measure the biological determinants including melatonin and melatonin metabolites in urine samples and any associated genetic variants.



How we did the research

Parents/caregivers completed the Childhood Sleep Habits Questionnaire (CSHQ), Vineland Adaptive Behavioral Scale-2nd Edition and Short Sensory Profile-2nd Edition.

Researchers completed Autism Diagnostic Observation Schedule-2nd Edition (ADOS-2) to ascertain the autism traits and Mullen Scale of Early Learning for assessment of cognitive level.

Melatonin levels were measured from urine samples.

Genotype data were extracted from the Australian Autism Biobank.



Who took part?

969

children on the autism spectrum (aged 2-17 years)

188

siblings

111

non-autistic, non-related children (controls).

Participants were recruited via the Australian Autism Biobank (AAB).



Who did the research?



Acknowledgements

We would like to thank the children, families, and research staff who participated in this study.





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What did we find?



Compared to siblings and non-autistic, non-related children (controls) children on the spectrum had statistically significantly poorer sleep quality.



Further, preschool-aged children on the spectrum were found to have higher level of bedtime resistance, higher levels of sleep anxiety and night wakings while adolescents were found to have greater sleep onset delays and increased daytime sleepiness. This suggests that consideration should be given to providing developmentally appropriate resources and supports.



Also, females were found to have more sleep problems than males, specifically with greater levels of bedtime resistance, reduced sleep duration, increased levels of sleep anxiety and higher levels of daytime sleepiness.



Higher levels of autism-related traits (social affect and restricted repetitive behaviours) predicted less sleep problems while sensory issues were found to be associated with more sleep problems.



What did we find?



These findings suggest that behavioural and sensory issues are more linked to sleep problems than autism traits per se. On the other hand, children with higher adaptive functioning had less sleep problems.



Further, children from families with lower income levels were found to experience greater severity of sleep problems, suggesting a role for environmental factors in addition to developmental determinants.



We found a paradoxical relationship of higher melatonin with poorer sleep quality but this seems to be driven by the younger age of the sample.



Genetic contribution from the Genome Wide Association Study indicates that one Single Nucleotide Polymorphism (SNP) near the SNAP25 gene may be associated with the melatonin level. In this regard it is noteworthy that disruptions of the SNAP25 gene have been found to cause dysregulated circadian rhythm, the biological clock that regulates the sleep wake cycle.

Australian Autism Biobank

The Australian Autism Biobank is Australia's largest collection of biological, behavioural, environmental and medical information of children on the autism spectrum and their families. Almost 3,000 autistic and non-autistic children and adults participated from across Australia.

The Australian Autism Biobank is an initiative of Autism CRC, which receives funding from the Australian Government.

For more information, visit autismcrc.com.au/biobank

