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Can 22q11.2 deletion syndrome be used as model to understand the impact of childhood environmental factors on the development of psychosis?

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Background

We conducted a study delving into the impact of childhood environment on the development of psychosis in the 22q11.2 deletion syndrome (22q11.2DS) cohort. 22q11.2DS is viewed as a model of both genetic vulnerability and early traumatic experiences, resulting in a varied phenotype, including a high prevalence of psychotic disorders. Few studies have aimed to identify the influencing factors that result in only a proportion of individuals developing prodromal psychotic symptoms and/or psychosis, despite the prodromal phase being hailed as a prime intervention opportunity.

Method and patients

We investigated the effect of the following variables: stressful and positive life events (SLEs and PLEs), family environment, socioeconomic background and birth order and season, on the development of prodromal and psychotic symptoms. Through this, we aimed to explore the concept that 22q11.2 DS may be utilised as a model to further understand the development of psychosis.

Results

We found that individuals with prodromal psychotic symptoms had a significantly lower frequency of PLEs and lower cohesion, conflict and family environmental scores (corresponding to better cohesion, less conflict and worse family functioning, respectively). Further, those with prodromal psychotic symptoms had a non-significantly higher frequency of SLEs and deprivation, as per the results table below.

Variable		Absence of psychotic symptoms	Presence of psychotic symptoms	P value
Cohesion	Mean	32.00	26.93	0.002
	SD	1.91	3.86	
Conflict	Mean	13.43	17.60	0.006
	SD	2.07	4.72	
Family environment	Mean	65.43	54.53	0.003
	SD	3.50	7.94	
Positive life events	Mean	1.71	1.04	0.016
	SD	1.31	1.72	
Stressful life events	Mean	1.07	1.87	0.094
	SD	1.44	1.73	
Deprivation	Mean	6.93	6.00	0.239
	SD	1.83	2.74	

Additionally, a non-significantly increased relative risk of prodromal symptoms was present for spring/ winter births, relative to autumn/ summer births: RR:1.214, CI:0.794-1.857, p=0.364. No significant differences were found between self-esteem, birth order and season and prodromal symptoms.

Conclusion

The higher levels of cohesion and family conflict in those without prodromal symptoms, relative to those with, was not expected. A possible hypothesis is that individuals at a high-risk state of psychosis may find the emotional relationships of family life overwhelming, resulting in increased physiological arousal and an inability to cope (Jena and Bhatia, 2012). Further, low levels of neighbourhood cohesion may overrule the effects of high levels of family cohesion (Newbury et al., 2016). Thus, differing individual neighbourhoods may partly account for these findings.

The significantly smaller number of positive life events, in those with prodromal psychotic symptoms, is an exciting finding. It demonstrates the interplay between environmental factors and genetic vulnerability in the development of prodromal psychotic symptoms in the 22q11.2DS cohort, subsequently providing potential opportunities for early intervention.

This concept is supported by a previous study suggesting that 'effective coping strategies are related to less severe clinical symptoms and better social functioning in the 22q11.2DS cohort' (Armando et al., 2018). Further studies analysing the effectiveness of interventions in this cohort are now called for. If this trend was cemented, this could lead to ground breaking opportunities for the wider population. Further, the unexpected findings highlight the depth of knowledge that is not yet known and further indicates the need for more research in this area.

While 22q11.2DS is a rare condition, findings here may echo far outside this cohort. Research in this cohort could yield a greater insight into factors influencing the development of psychosis. This may subsequently lead to the discovery of novel methods to reduce the incidence of psychosis on a larger scale.

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Biography

Seline Ismail-Sutton MBBch, graduated from Cardiff University Medical School in 2020. Since then she is undertaking her foundation doctor training at Royal Bournemouth Hospital. She has particular interests in paediatric medicine and paediatric genetics. She also partakes in teaching undergraduate medical students and physician associate students. Topics of scientific interest include 22q11.DS syndrome, particularly the development of psychosis in this cohort and the effect of environmental factors

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