Utilizing exposome score for schizophrenia to predict mental health outcomes

9.1 Impact Paragraph

Psychosis spectrum disorders (PSD) are characterized by disorganization, positive, negative, mania, and depression symptoms[1]. Antipsychotic drugs may help with improving symptoms, particularly positive psychotic symptoms, but they have less impact on improving loss of functioning in PSD[2].This is likely due to the fact that the origins of functional impairment are not well understood. The estimated healthcare costs of mental disorders are approximately €495 billion in Europe. With approximately €93.9 billion, PSD is responsible for most of this cost[3]. A large part of this cost is linked to caregiver-related costs as well as the fact that these individuals have difficulties maintaining their own lives and show loss of functionality in work and social areas. The loss of functionality increases with an increased duration of illness. To improve prevention and treatment approaches for psychosis, it is important to understand the underlying mechanism of psychosis as well as associated functional impairment. In this regard, a specific focus should be on mechanisms and factors that are modifiable and preventable. Therefore, the current thesis aimed to investigate the environmental vulnerability of PSD. This thesis adopts the exposome approach which aims to include all non-genetic exposures an individual is exposed to from birth to death. The ambition of exposome framework is to capture the complexity and dynamic nature of environmental exposures.

The studies in this thesis are linked to the aims of the national and international research agendas such as the “personalized medicine” and make a valuable contribution to the environmental research on the pathoetiology of PSD. By embracing the exposome paradigm, the studies in this thesis applied an aggregated environmental risk score for schizophrenia, exposome score for schizophrenia (ES-SCZ), to understand the underlying mechanisms of PSD and functional disability. The thesis provides evidence that ES-SCZ predicts poor functioning and functionality. Findings from this thesis show that embracing the exposome approach instead of applying single-risk-single-outcome approaches helps better capture environmental vulnerability for PSD and may help improve population-based mental health outcomes in the future.

In line with previous findings [4,5], the results obtained from this thesis provide support for the clinical utility of ES-SCZ. The studies show that ES-SCZ is associated with psychosis risk strata and poor functioning. These findings suggest that ES-SCZ may be a useful tool to be integrated into clinical practice and provide an understanding of psychosis risk stages. The assessment of environmental risk factors for schizophrenia should be an integral part of the routine clinical evaluation of individuals with psychosis or high risk for psychosis. Although ES-SCZ is not indicative of functional improvement, it is a possible predictor of poor trait-level functioning. Therefore, it might help predict whether an individual with PSD has increased functional impairment. Incorporating ES-SCZ into electronic health records or health screenings may help with estimating individual-level risk. Furthermore, exposomic liability for schizophrenia does not only play a critical role for PSD, ES-SCZ is also associated with mental health and physical health[6]. Therefore, ES-SCZ can be used to understand the nature of multidimensional psychopathology in psychiatric disorders.

For future studies, investigating the exposome paradigm in the context of biological mechanisms such as the immune system can be a useful approach to understanding biological systems that are involved in the development of PSD. Furthermore, genomic vulnerability for schizophrenia moderates the effect of environmental vulnerability for schizophrenia on PSD. Therefore, gene-environmental interaction studies on functioning will likely provide further understanding on the complex etiology of PSD.

References

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