Brain structure predicting functioning at a later stage in live in individuals at increased risk for psychosis

Psychosis is a severe mental disorder that is characterised by symptoms of hallucinations, delusions, confused and disturbed thoughts, and lack of insight and self-awareness. Most individuals who are at increased risk for developing psychosis do not develop the illness. Nevertheless, many have mental health problems and difficulties functioning in daily life. This study used brain imaging techniques to investigate if brain structure of individuals at increased risk for psychosis measured at the start of the study was associated with functioning at a later stage in life. Participants were help-seeking individuals at increased risk for psychosis (n = 109, 54M:55F) who underwent a brain scan at the start of the study. Functioning was assessed an average of 9.2 years later. Primary analysis showed that lower grey matter density at the time of the brain scan, but not white matter density, in bilateral frontal and limbic areas, and left cerebellar declive were significantly associated with poorer functioning years later.

These findings were not associated with development of psychotic illness or a continued increased risk for developing psychosis. Similar brain regions were significantly associated with lower self-reported levels of social functioning and increased negative symptoms (e.g. blunted affect) in later years. Exploratory analyses showed that lower grey matter densities in middle and inferior frontal gyri were significantly associated with absolute decline in functioning (years later compared to the start of the study). There was no association between grey matter density and IQ or positive symptoms (e.g. hallucinations) years later. The current findings provide novel evidence that those with the poorest functioning in later years have the lowest grey matter densities at identification as being at increased risk for developing psychosis, regardless of them developing the illness in later years or maintaining increased risk. The location of these densities in the brain suggests that social dysfunction may play an important role in explaining the poorer functioning in later years and that there is a strong association with negative symptoms.

The findings also support recent statements that treatment should not only focus on those who will develop psychotic illness but also on those with predicted poor functioning. Treatments that specifically target social impairments could be a way of alleviating long-term social disability and distress. Replication and validation of the current findings may allow for early identification of those individuals who are at increased risk for psychosis and may have a prospect of poor functioning. The next step should therefore involve implementation and evaluation of the efficacy of psychosocial interventions in these individuals to reverse the structural alterations that may lead to poorer functioning. Additionally, the findings of this study provide scope for application in the wider context of mental health, by increasing our understanding of those who show poor functioning but never develop a psychotic illness, and may suggest a shift of focus to functioning rather than distinct diagnostic categories.

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