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Brain Atrophy and Antipsychotic Medication – a Systematic Review

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It is well known that schizophrenia has a neuroprogressive component with many patients presenting tissue volume decrease occurring after onset. These changes include both grey and white matter with a special focus on the frontal lobes. To explore the role of antipsychotic medication we performed a systematic review which identified ten longitudinal studies on frontal brain volume reduction in patients with schizophrenia spectrum disorders using magnetic resonance imaging and data on antipsychotic treatment. We correlated antipsychotic treatment dose with volume changes and tried to control disease severity as a confounder. The findings indicate that there is evidence for grey and white matter atrophy of the frontal brain, which cannot be explained by the severity of the disease alone but is also very likely a manifestation of long term effects of antipsychotics. Despite many methodological shortcomings, most studies point to significant effects of antipsychotics. Five of eight studies with patients on first generation antipsychotics show reductions in frontal grey matter or cortical thickness which correlated with antipsychotic dose. This was also true in four of eight studies with second generation antipsychotics. Five studies had study durations of more than two years. More recent studies suggest that changes occur already in the first weeks of treatment. Considering the contribution of antipsychotics to the changes in brain structure, which seem to depend on cumulative dosage and can exert adverse effects on neurocognition, negative and positive symptoms and psycho-social functioning, guidelines for antipsychotic long term treatment should be reconsidered.

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