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STRUCTURAL AND FUNCTIONAL IMAGING STUDIES IN CHRONIC CANNABIS USERS: A SYSTEMATIC REVIEW OF ADOLESCENT AND ADULT FINDINGS

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Introduction: The growing concern about cannabis use, the most used illicit drug worldwide, has led to an increase in the number of cannabis studies using neuroimaging techniques to determine its effect on brain structure and function.
Aims: We conducted a systematic review to assess the evidence of the impact of chronic cannabis use on brain structure and function in adults and adolescents.
Methods: Papers published until August 2012 were included from EMBASE, Medline, PubMed and LILACS databases following a comprehensive search strategy and pre-determined set of criteria for article selection. Only neuroimaging studies involving chronic cannabis users with a matched control group were considered.
Results: One hundred and forty-two studies were identified, of which 43 met the established criteria. Eight studies were in adolescent population. Neuroimaging studies provide evidence of morphological brain alterations in both population groups, particularly in the medial temporal and frontal cortices, as well as the cerebellum. These effects may be related to the amount of cannabis exposure. Functional neuroimaging studies suggest different patterns of resting global and brain activity during the performance of several cognitive tasks also in both groups, which may indicate compensatory effects in response to chronic cannabis exposure. The results pointed out methodological limitations among studies and high heterogeneity in the findings.
Conclusion: Chronic cannabis use may alter brain structure and function in adult and adolescent population. Further studies should consider the use of convergent and multimodal methodology, prospective large samples involving adolescent to adulthood subjects, and data-sharing initiatives. *Grants: PNSD/2011/050, PNSD2006/101, SGR2009/1435.*

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