Study of neurofunctional changes after ayahuasca intake

Reference:
Pinto, J.P. Estudo sobre alterações neurofuncionais após ingestão de ayahuasca. Dissertação de Mestrado em Medicina. Universidade de São Paulo, Ribeirão Preto, 2010.

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Summary in English:
Ayahuasca is a tea original from the Amazon that is used by Brazilian syncretic religious groups. Made from the boiled leaves of Psychotria sp and fragments of the vine Banisteriopsis sp, the beverage contains the short half-life hallucinogen dimethyltryptamine (5-HT2A receptor agonist) and ?-carbolines (monoamine oxidase inhibitors). It has been shown that Ayahuasca can induce altered states of consciousness accompanied by perceptual alterations, and it has been suggested as a potential model of psychosis. **Objective**: To assess the acute changes in cerebral blood flow (CBF) induced by Ayahuasca and its modulation of brain activity during a verbal fluency task. Methods: Two experiments were performed involving healthy volunteers. In the first one, CBF changes were investigated using SPECT in 10 volunteers who had never used Ayahuasca. The data were acquired in two sessions, at least one week apart, with patients at rest. In one of the sessions, volunteers were given a 200 ml dose of the tea. In the second study, 10 ritualistic Ayahuasca users underwent fMRI scans during the performance of a verbal fluency task (FAS). Ayahuasca (150 ml) was administered in one of the sessions. Results: Behavioral changes were similar in the two experiments, with sensory, perceptual, and thought alterations, and mood/affect elevation, with no loss of contact with reality. SPECT showed activation of the frontal and temporal cortex and limbic areas. CBF was found to be decreased in a region of the right cerebellar hemisphere. fMRI data showed decreased activation of areas involved in language processing, with reduced physiological hemisphere lateralization during the word-generating task. Such alterations have been implicated in psychotic disorders and substance-induced altered states of consciousness. Conclusions: The modulation of brain activity by Ayahuasca seems to be useful for the study of the neurobiology of psychosis, although differences exist between psychosis and the state induced by the substance.

Keywords: Ayahuasca; SPECT; Functional magnetic resonance; Psychosis