

Physiologic dysfunction of dorsolateral prefrontal cortex in schizophrenia: I. Regional cerebral blood flow evidence.

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February 1986

Physiologic Dysfunction of Dorsolateral Prefrontal Cortex in Schizophrenia I. Regional Cerebral Blood Flow Evidence

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Arch Gen Psychiatry. 1986;43(2):114-124. doi:10.1001/archpsyc.1986.01800020020004

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Abstract

• To evaluate dorsolateral prefrontal cortex (DLPFC) physiology and function simultaneously, 20 medication-free patients with chronic schizophrenia and 25 normal controls underwent three separate xenon Xe 133 inhalation procedures for determination of regional cerebral blood flow (rCBF): first at rest, then while performing an automated version of the Wisconsin Card Sort (WCS), a DLPFC-specific cognitive test, and while performing a simple number-matching (NM) test. During rest, patients had significantly reduced relative, but not absolute, rCBF to DLPFC. During NM, no specific region differentiated patients from controls. During

WCS, however, both absolute and relative rCBF to DLPFC significantly distinguished patients from controls. While controls showed a clear increase in DLPFC rCBF, patients did not. The changes were regionally specific, involving only DLPFC. Furthermore, in patients, DLPFC rCBF correlated positively with WCS cognitive performance, suggesting that the better DLPFC was able to function, the better patients could perform. Autonomic arousal measures, the pattern of WCS errors, and results of complementary studies suggest that the DLPFC finding is linked to regionally specific cognitive function and is not a nonspecific epiphenomenon.

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