Cerebral Blood Flow Differences in Major Depressive Disorder using Arterial Spin Labeling: Preliminary Results from the EMBARC Study

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ABSTRACT

Arterial spin labeling (ASL) is a noninvasive neuroimaging technique used to measure cerebral blood flow (CBF). Has promise to be used as an effective tool to understand resting abnormalities in patient populations such as major depressive disorder (MDD). Past research has shown the following differences in CBF using ASL:

Recent ASL Studies

Default Mode Network Abnormalities

Classify Unipolar from Bipolar Depression

Analytic Methodology

THE EMBARC STUDY

Randomized, placebo-controlled trial of a serotonin selective reuptake inhibitor and placebo for participants with major depressive disorder (MDD).

Assess clinical (e.g., anxiety, depression, early life trauma, gender) and biological (i.e., neuroimaging, electrophysiology and behavioral neuropsychiatric) moderators and mediators of outcome.

Goal: Identify differences in CBF between patients with MDD and healthy controls using ASL.

ASL RESULTS

Absolute CBF:

Statistical Parameters:

P-value < .005 Extent Threshold 200

Results:

p < .001

f = 3.39

Relative CBF:

Statistical Parameters:

P-value < .005 Extent Threshold 200

Results:

p < .001

f = 3.29

ASL RESULTS (CONT’D)

Site Effect:

(Example from Absolute CBF)

Statistical Parameters:

P-value < .005 Extent Threshold 200

RESULTS

CONCLUSIONS

While ASL has been more widely used as a research tool, it has the prospects of being used as a tool for clinical diagnostics and informing treatment decisions.

Our present work provides further evidence of the role of ASL in detecting abnormalities in resting CBF for multiple brain regions thought to be important in the phenotype of MDD.

It should be noted, that throughout preliminary analyses, some brain regions appear to be more or less sensitive to site effects. This is important to understand, and should be investigated and considered further in future research and analyses using multiple sites.

These preliminary results may have implications for future studies aimed at further developing CBF as a biomarker in clinical populations.

REFERENCES


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DISCLOSURES

Authors have no conflicts to disclose in relation to this study. Lifetime or other disclosures can be made available upon request.