【文献調査】
Causal relationship between effective connectivity within the default mode network and mind-wandering regulation and facilitation

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1　タイトル

デフォルトモードネットワーク内の効果的な接続とマインドワンダリングの促進・抑制との因果関係

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3　出典

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4　アブストラクト

経頭蓋直流刺激（tDCS）は，思考が進行中の課題や外部環境内の事象から自己生成の思考や感情へとシフトする，マインドワンダリングを調節することができる．マインドワンダリング頻度の調節は外側前頭前野（the lateral prefrontal cortex : LPFC）や Default mode network（DMN）における領域の神経変性に関連すると考えられるが，正確な神経メカニズムは未知のままである．機能的核磁気共鳴イメージング（functional magnetic resonance imaging : fMRI）を用いて，我々は tCDS（DMN のコア領域である右 IPL 上に配置された 1 つの電極と，左 LPFC 上に配置された別の電極），DMN 内の刺激によって誘発された指向性接続変化，およびマインドワンダリング頻度の調節との間の因果関係を調べた．行動レベルでは，右 IPL におけるアノード tDCS（左 IPL におけるカソード tDCS を有する）が，逆の刺激と比較してマインドワンダリングを減少させた．神経レベルでは，右 IPL におけるアノード tDCS は，後部帯状皮質（PCC）の求心性接続を右 IPL および前頭前野（mPFC）から減少させた．さらに，媒介分析では，右 IPL および mPFC からの接続の変化が，マインドワンダリングの促進および抑制とそれぞれ相関することが示された．これらの効果は，効果的な接続の不均質な機能の結果である．すなわち，右 IPL から PCC への接続はマインドワンダリングを妨げるが，mPFC から PCC への接続はマインドワンダリングを促す．現在の研究は，マインドワンダリング頻度の tDCS 調節の基礎をなす神経メカニズムを実証するものである．

5　キーワード

Default mode network, Mind wandering, Effective connectivity, Spectral dynamic causal modeling, Transcranial direct current stimulation

6　参考文献

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