Document details

Journal of Physics: Conference Series
Volume 1248, Issue 1, 6 June 2019, Article number 012005
18th Asia-Oceania Congress of Medical Physics, AOCMP 2018 and 16th South-East Asia
COMP 2018; Connexion Conference and Events CentreBangsar
South, Kuala Lumpur; Malaysia; 11 November 2018 through 14 November 2018; Code 148751

Resting-state fMRI: Comparing default mode network connectivity between normal and low auditory working memory groups (Conference Paper) (Open Access)

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Abstract

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The relationship between resting effective connectivity (EC) among default mode network (DMN) regions and auditory working memory (AWM) performance is still poorly understood. In this work, resting-state functional magnetic resonance imaging (rsfMRI) was used to determine the optimum connectivity model between posterior cingulate cortex (PCC) and medial prefrontal cortex (mPFC) in 40 healthy male volunteers. in low and normal working memory groups of subjects. Correlation between EC with AWM performance and AWM-capacity was also studied. The participants were divided into two groups which are normal and low AWM-capacity groups based on Malay Version Auditory Verbal Learning Test. The AWM performance was assessed using a word-based backward recall task. Both assessments were conducted outside the MRI scanner. The participants were scanned using a 3-T MRI system and the data were analyzed using statistical parametric mapping (SPM12) and spectral Dynamic Causal Modelling (spDCM). Results revealed that PCC and mPFC were significantly interconnected in both groups. Group analyses showed that the connection between PCC and mPFC exhibits an anti-correlated network. The results also indicated that the AWM performance and AWM-capacity were not associated with EC. These findings suggest that EC at rest between the two regions may not significantly influence cognitive abilities important for this AWM task. © Published under licence by IOP Publishing Ltd.

SciVal Topic Prominence

Topic: Brain | Magnetic Resonance Imaging | Network DMN

Prominence percentile: 99.951

Indexed keywords

Engineering controlled terms: Magnetic resonance imaging | Medical Physics | Photomapping | Scanning

Engineering uncontrolled terms: Connectivity model | Default mode network (DMN) | Default-mode networks | Effective connectivities | Prefrontal cortex | Resting-state fmri | Resting-state functional magnetic resonance imaging | Statistical parametric mapping

Engineering main heading: Biophysics

Funding details

Funding sponsor	Funding number	Acronym
	GGP-2017-010	

Funding text

This study was funded by the UKM Incentive Research Grant GGP-2017-010.

ISSN: 17426588
Source Type: Conference Proceeding
Original language: English

DOI: 10.1088/1742-6596/1248/1/012005
Document Type: Conference Paper
Volume Editors: Zin Z.,Yusoff A.N.,Rahman A.T.A.,Ng K.H.
Sponsors: Bayer,Transmedic
Publisher: Institute of Physics Publishing

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