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CENTRAL EXPRESSION OF ABNORMAL AND UNEXPLAINED SKIN SENSATIONS

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Jessica A Eccles,¹ Sarah N Garfinkel,^{1,2} Ruth E Taylor,³ Anthony P Bewley,⁴ Hugo D Critchley^{1,2}. ¹Department of Psychiatry, Brighton and Sussex Medical School, UK; ²Sackler Centre for Consciousness Science, University of Sussex, UK; ³Department of Psychiatry, Barts and the London NHS Trust, London, UK; ⁴Department of Dermatology, Barts and the London NHS Trust, London UK

Objective A sub-group of patients present to dermatological services with unexplained skin sensations that characteristically evoked a subjective sense of infestation. The consequent psychological and behavioural impacts of these experiences are considerable and difficult to manage therapeutically. Underlying neurobiological mechanisms are unclear. We therefore undertook the first functional MRI study to test the hypothesis that such patients will differ from controls in central neural processing of affective and infestation-related stimuli.

Method Participants: Five patients presenting with medically unexplained skin sensations were recruited from the specialist psychodermatology service at The Royal London Hospital, mean age 52.8 years, 4 female, 1 male. Five healthy controls were matched for age and gender. Image acquisition: Whole brain MRI data was acquired on a 1.5 T scanner. Task: In a randomized event-related design participants were shown 6 classes of images - insects on skin; insects on leaf; other objects on skin; other objects on leaf; neutral images; disgusting and fearful images. Analysis: Functional images were analyzed using SPM8. A full factorial model was used to analyze the results with two factors - group and stimulus type.

Results Across all conditions patients showed greater activity in the right parahippocampus. Insect versus non insect images evoked greater activation within occipital regions. The main effect of presentation of skin rather than leaf stimuli was to activate inferior parietal lobule and the patients showed enhanced activity within this area. Formal testing of differential responses of patients v. controls to images of insects on skin (three way interaction) revealed differences in the engagement of dorsal anterior cingulate and right lateral prefrontal cortices. Patients also showed greater activity in bilateral temporal lobes when viewing disgusting/fearful images compared to neutral images.

Conclusion We confirm that regional neural activity differs between patients with abnormal skin sensations and controls to condition-relevant and affective visual stimuli. These data provide insight into central mechanisms that potentially represent novel treatment targets.