

Plenary

OC-044

GENDER DIFFERENCES IN BRAIN ACTIVITY EVOKED BY VISCERAL PAIN IN HEALTHY SUBJECTS

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Introduction Females are more likely than males to suffer from many chronic pain conditions, including functional gastrointestinal disorders. However, due to the limited number of studies, information available about gender-differences in normal human central processing of visceral pain is still preliminary. We investigated whether gender differences exist in brain response to visceral pain in a large cohort of healthy volunteers.

Methods Sixteen males and sixteen females (mean age = 31 and 28, respectively) participated in the study. Functional magnetic resonance imaging was used to acquire blood oxygen level dependent contrast images at 3 Tesla. Data was collected whilst subjects received painful balloon distensions to the distal esophagus as well as during anticipation of pain. The Eysenck Personality Questionnaire-Revised (EPQ-R) was used to assess personality trait in each subject. During fMRI scanning, subjective perception of the pain stimulus was measured by visual analogue scale, as well as skin conductance response (SCR).

Results There was no significant difference in subjective ratings of pain and personality scale (neuroticism, extraversion and psychoticism) between males and females. Males showed higher SCR in anticipation and oesophageal pain compared to rest ($p = 0.02$, $p = 0.0002$, respectively). Female showed higher SCR in only pain compared to rest ($p = 0.0006$). During anticipation, males demonstrated greater activation in the right amygdale and anterior cerebellum, whilst females produced greater brain activity than males in the right supplementary motor area (SMA) and posterior cerebellum. During oesophageal pain males showed greater activation in the SMA and left caudate, whilst females showed greater activation in the mid cingulate cortex, premotor cortex and cerebellum. All brain data was significant at least level $p \leq 0.05$.

Conclusion Brain activity during anticipation suggests men may experience fear whilst women may mount a planning-motor response. During pain, men show an increased motor response whilst women preferentially activate brain areas associated with the negative affective component of pain suggesting they may attribute more negative emotions during pain processing. These differences may underlie the gender biases that exist in functional pain disorders that are more prevalent in females and where affective comorbidity is present.

Competing interests None.

Keywords brain gut axis, gender, visceral pain.