

## Track: 4. Basic Science

# Altered Functional Connectivity of the Anterior Insula in Psychogenic Erectile Dysfunction

Nicoletta Cera<sup>a</sup>, Joana Carvalho<sup>b</sup>, Ana Quinta-Gomes<sup>c</sup>, Ines Tavares<sup>c</sup>, Raquel Pereira<sup>c</sup>, Cátia Oliveira<sup>c</sup>, João Castelhana<sup>b,d</sup>, Erick Janssen<sup>e,f</sup>, Miguel Castelo Branco<sup>b,d</sup> and Pedro Nobre<sup>c</sup>

<sup>a</sup>Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto, Porto, Portugal; <sup>b</sup>Universidade Lusófona de Humanidades e Tecnologias, Lisbon, Portugal; <sup>c</sup>Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto, Porto, Portugal; <sup>d</sup>CIBIT, ICNAS, University of Coimbra, Coimbra, Portugal; <sup>e</sup>Institute for Family and Sexuality Studies, Department of Neurosciences, University of Leuven, Leuven, Belgium; <sup>f</sup>The Kinsey Institute for Research in Sex, Gender, and Reproduction, Indiana University, Bloomington, IN, USA

**Introduction & objectives:** Little is known about the brain mechanisms underlying cognitive-affective processing in erectile dysfunction (ED). Anterior and posterior insula are key regions in the processing of emotions and cognitive functions. This study compared functional connectivity (FC) pattern of anterior and posterior insula in men with psychogenic ED (EDp) and healthy controls (HC) during the presentation of sexual and neutral video clips.

**Methods & Sample, Results:** Participants were 15 EDp and 18 HC (age: 25-45). After urological, and clinical assessment, fMRI data were collected using a 3T scanner during the presentation of the clips (T2\*: EPI, TR = 2500ms, TE = 30ms, voxel size 2, 5 × 2, 5 × 3mm, 360 volumes-max and 39 slices; T1: matrix = 256 × 256, FOV 256mm, voxel size 1mm<sup>3</sup>, flip angle 12°). Penile tumescence (PT) was assessed. After pre-processing and Talairach normalization, 2 bilateral seed regions (anterior and posterior insulae) were selected on the anatomical bases. We then calculated correlations between Seed time-courses and whole-brain voxels time-course. Between-groups differences were assessed by means of a voxel-wise 2(anterior vs posterior insula) × 2(EDp vs HC) ANOVA. No

significant results have been found for the between group comparison in the posterior insula. For the anterior insula between group differences have been found ( $p < 0.05$  FDR). For the comparison EDp > HC significant an improved FC has been observed in right ventral striatum and Thalamus and bilateral IFG. For the contrast HC > EDp increased FC was found in right postcentral sulcus and left STG.

**Conclusion & recommendations:** The two groups differed in the anterior insula FC. Our results are in line with previous studies that showed anterior Insula FC with postcentral sulcus and left STG are related to erection processing and empathy processing. Conversely, the results observed in EDp are consistent with previous reports showing the FC between anterior insula and ventral striatum during disgusting and aversive stimuli perception.

**Keywords:** Psychogenic ED, fMRI, ventral striatum Insula

**Source of Funding:** This study was funded by the FCT (Portuguese Science Foundation) PTDC/PSI-PCL/117522/2010

**Conflict of Interest and Disclosure Statement:** None