

# SEX DIFFERENCES IN NEUROPSYCHOLOGICAL PROFILE AND BRAIN HYPOMETABOLISM IN BEHAVIOURAL-VARIANT FRONTOTEMPORAL DEMENTIA



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## Introduction and aim

Behavioral variant frontotemporal dementia (bvFTD) is a form of early-onset dementia manifesting with executive deficits and behavioral changes. Sex differences in prevalence, clinical characteristics, and biomarkers, have been described in several neurodegenerative diseases, including FTD (1). However, these findings are still sparse and need further characterization.

**Our study aimed to investigate sex differences in neuropsychological profile and brain hypometabolism pattern, evaluated with FDG-PET.**

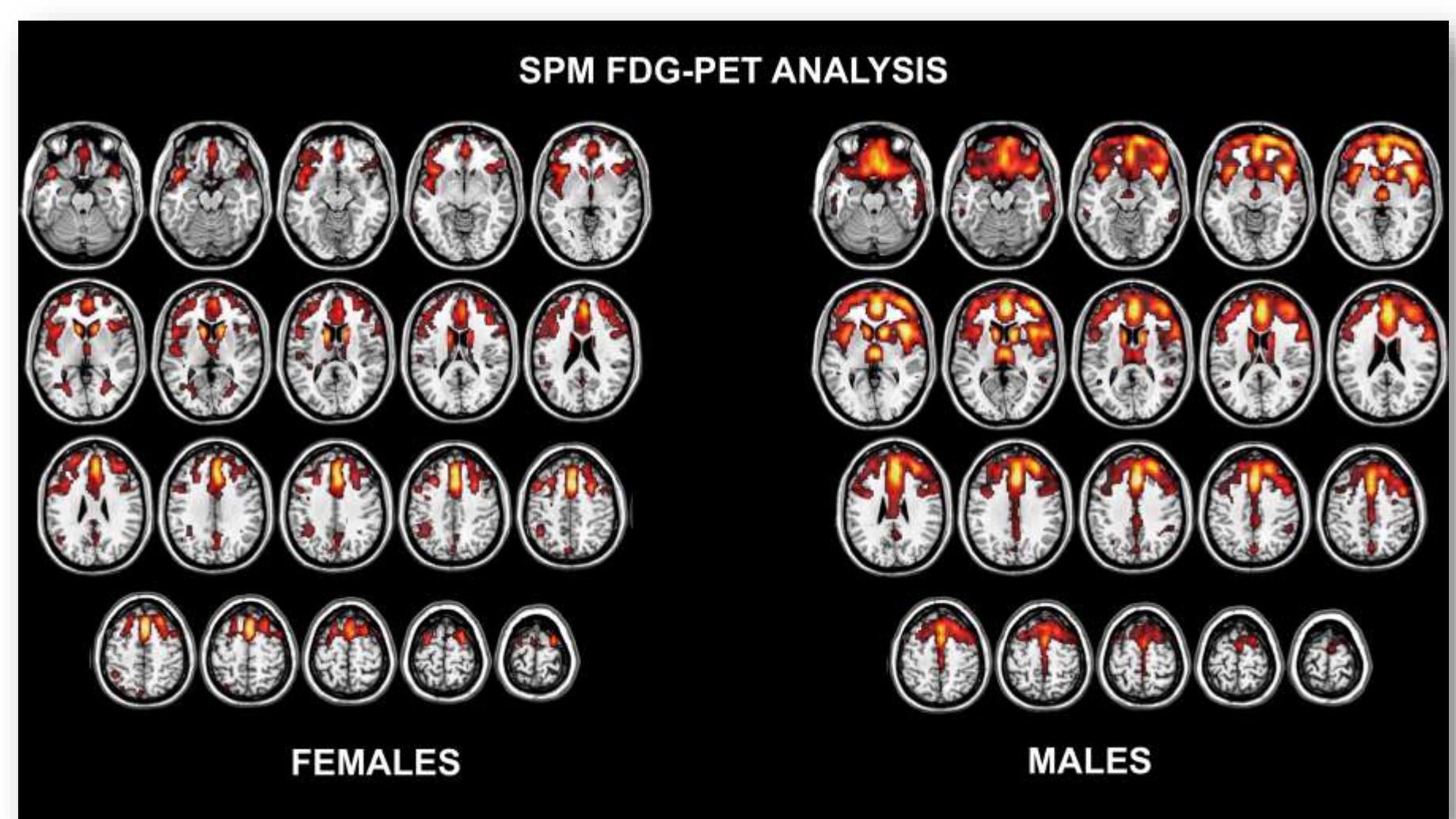
## Materials and methods

- **Patients included:** 20, 12 female (F), 8 males (M), diagnosed with bvFTD (2) at the Memory Clinics of Novara and Vercelli, Piedmont, Italy.
- **Investigations:** neurological and **neuropsychological** evaluation at baseline, to characterize the clinical presentation; a **brain MRI** and a **lumbar puncture** to support clinical diagnosis; a brain FDG-PET scan, analyzed with a validated SPM method (3) to obtain single-subject brain hypometabolism maps using a large dataset of controls for comparison (4).
- In **familial cases**, mutations in genes frequently associated with FTD were investigated.

## Results

- **Sex** did not influence global cognition, evaluated with the Mini-Mental State Examination and the Montreal Cognitive Assessment.
- **Specific cognitive domains:** F performed better than M in working **memory** (i.e., corrected Reverse Digit Span,  $p=0.01$ ), and worse in **language** (i.e., MOCA denomination subscore,  $p=0.03$ ).
- **Specific brain hypometabolic patterns:** FDG-PET showed a predominant **frontotemporal hypometabolism** in both groups. In M, compared with F, the insula and the orbitofrontal cortex were involved with widespread hypometabolism.

	FEMALES	MALES	p-value
MMSE	24,14	24,50	0,918
MOCA.	18,00	16,67	0,743
MOCA (LANGUAGE)	2,00	2,67	<b>0,031</b>
DIGIT SPAN FORWARD	5,66	5,15	0,410
DIGIT SPAN BACKWARD	4,29	2,92	<b>0,019</b>
RAVLT IMMEDIATE RECALL	32,72	31,53	0,831
RAVLT DELAYED RECALL	6,15	4,56	0,407
SHORT TALE	9,50	8,62	0,839
VERBAL FLUENCY *	26,21	22,03	0,506
FAB	13,01	14,30	0,636
ROCF RECALL	8,50	8,66	0,973



**TABLE: NEUROPSYCHOLOGICAL DIFFERENCES BETWEEN BVFTD FEMALES AND MALES** All results shown are mean values. FAB: Frontal Assessment Battery; MMSE: Mini-Mental State Examination; MOCA: Montreal Cognitive Assessment; RAVLT: Rey Auditory Verbal Learning Test; ROCF: Rey-Osterrieth complex figure. **FIGURE: PATTERN OF BRAIN HYPOMETABOLISM IN FEMALES (LEFT) AND MALES (RIGHT)** Results of the group analysis.

## Conclusion and discussion

From our preliminary data, sex might have a role in determining the type of neuropsychological impairment and the brain hypometabolism pattern in bvFTD, with males performing worse than females in working memory tests and better in language, with a broader hypometabolism pattern possibly related with neuropsychiatric burden. These results confirm that sex may play a role in influencing clinical phenotype in bvFTD, supporting the hypothesis of sex as a pivotal variable for biological and clinical differences in neurodegenerative diseases.

## Bibliography

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