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# Atrophy and perfusion patterns in synucleinopathies

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**Sin**  
SOCIETÀ ITALIANA DI NEUROLOGIA

# Synucleinopathies

They are neurodegenerative disease characterised by the abnormal accumulation of aggregates of alpha-synuclein protein

Parkinson Disease

Multiple System Atrophy

Dementia with Lewi Bodies

# Imaging

PD

Clinical diagnosis

MSA

- MRI

- atrophy of the putamen, middle cerebellar peduncles (MCP), cerebellum, or pons
- putaminal rim sign
- hot-cross-bun sign

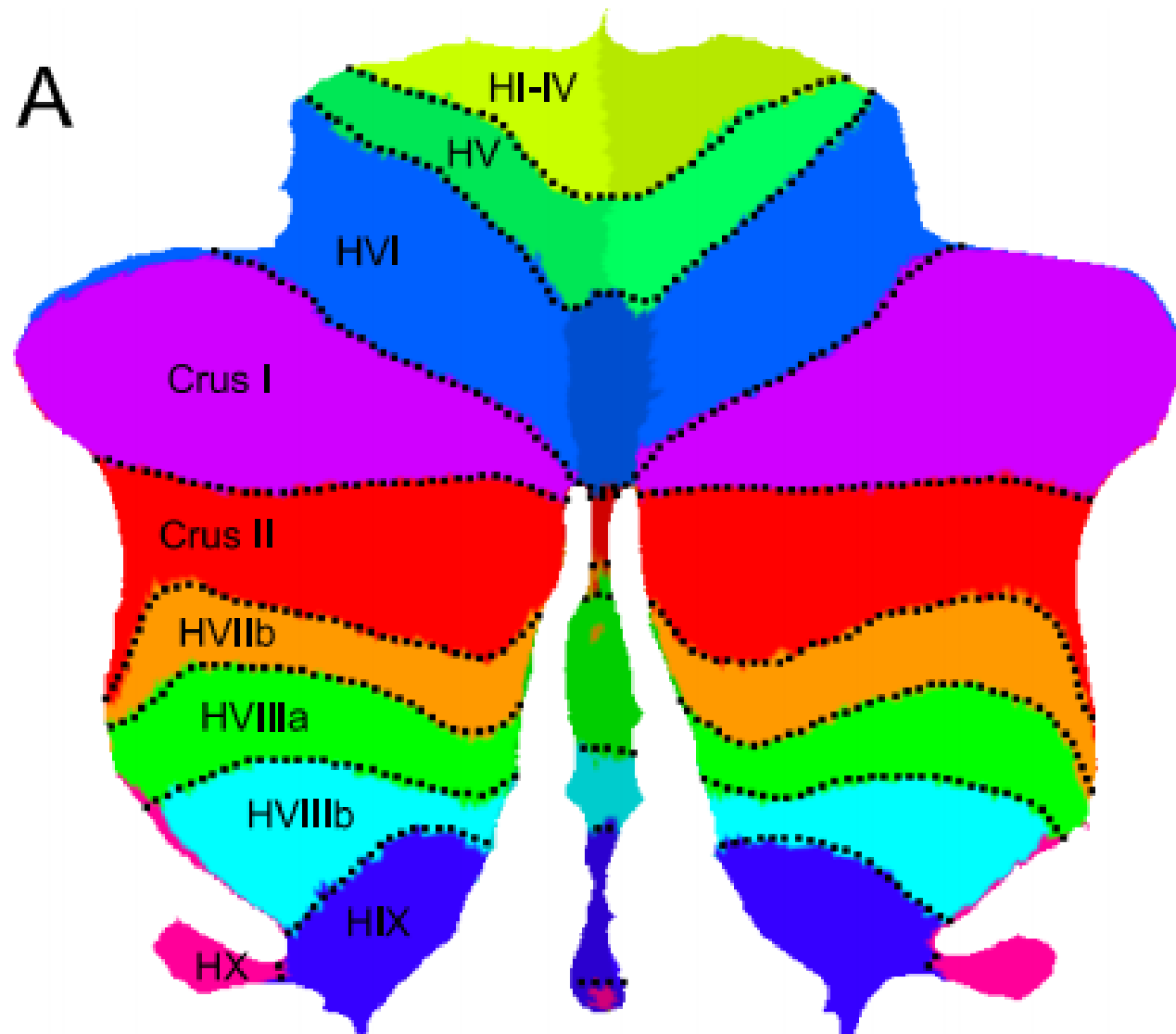
- PET

impaired glucose metabolism in the bilateral basal ganglia, putamen, pons and cerebellum

# Metodi

## 3 groups

## Arterial spin labling

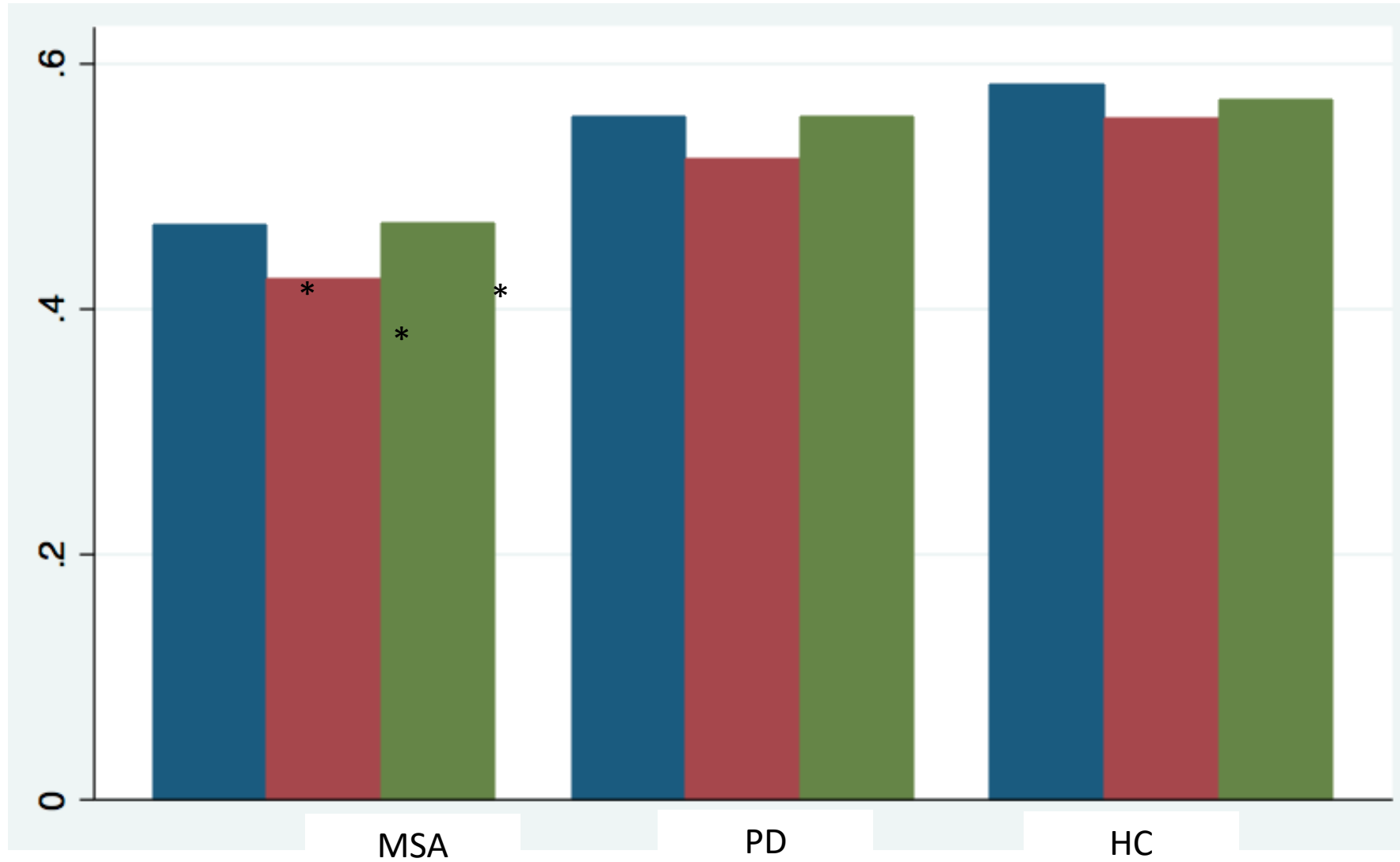


# Demographic characteristics

|                       | <b>PD (32pz)</b> | <b>MSA (35pz)</b> | <b>Control (37)</b> | <i>P value</i> |
|-----------------------|------------------|-------------------|---------------------|----------------|
| Age                   | 62.43±8.04       | 59.97±7.7         | 59.36±6.39          | <i>P=0.20</i>  |
| Sex                   | 15f (48%)        | 18f (52%)         | 18 (49%)            | <i>P=0.45</i>  |
| Onset                 | 57.41±9.1        | 56.28±7.7         | -                   | <i>P=0.58</i>  |
| Disease duration      | 5.01±3.5         | 5.06±2.8          | -                   | <i>P=0.95</i>  |
| Patients in treatment | 32(100%)         | 28 (80%)          | -                   | <i>P=0,03</i>  |
| LEDD                  | 494.3            | 361.5             | -                   | <i>P=0.09</i>  |
| UPDRS III             | 12.55            | -                 | -                   |                |
| UMSARii               | -                | 23.4              | -                   |                |

# Results VOLUME

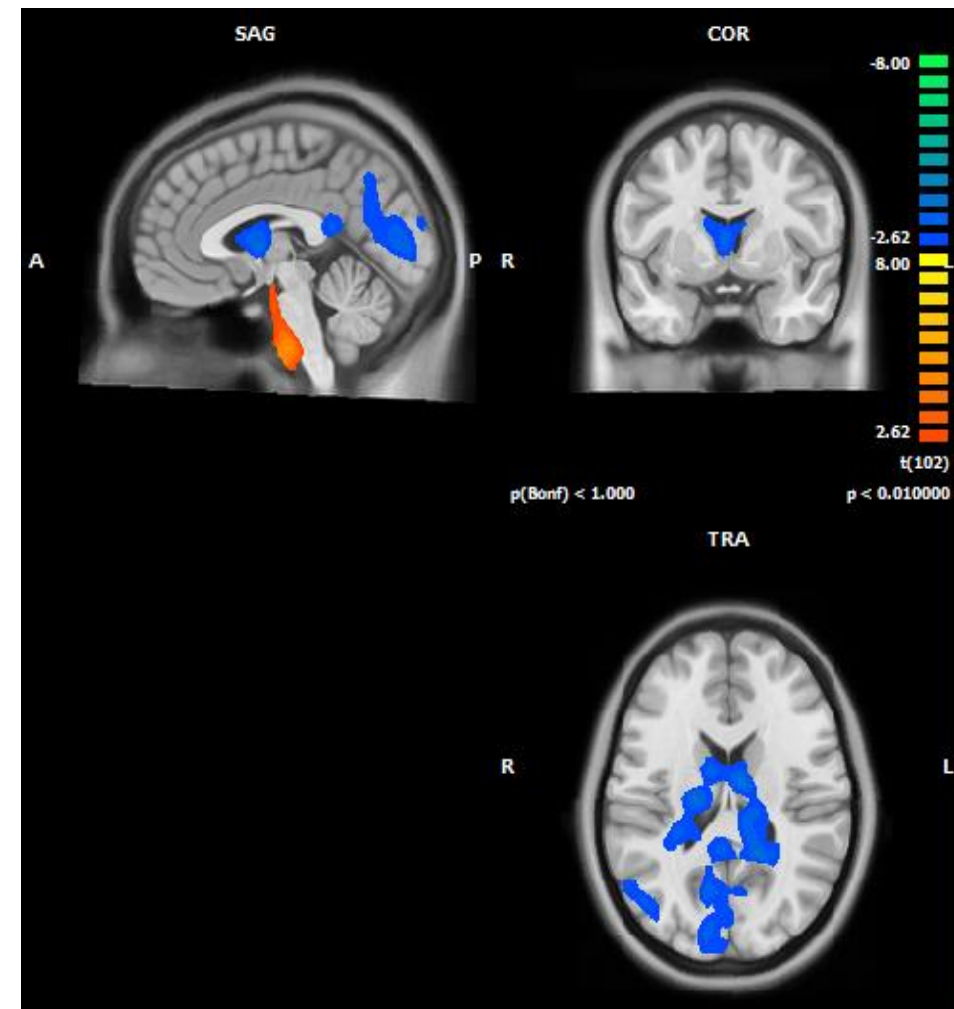
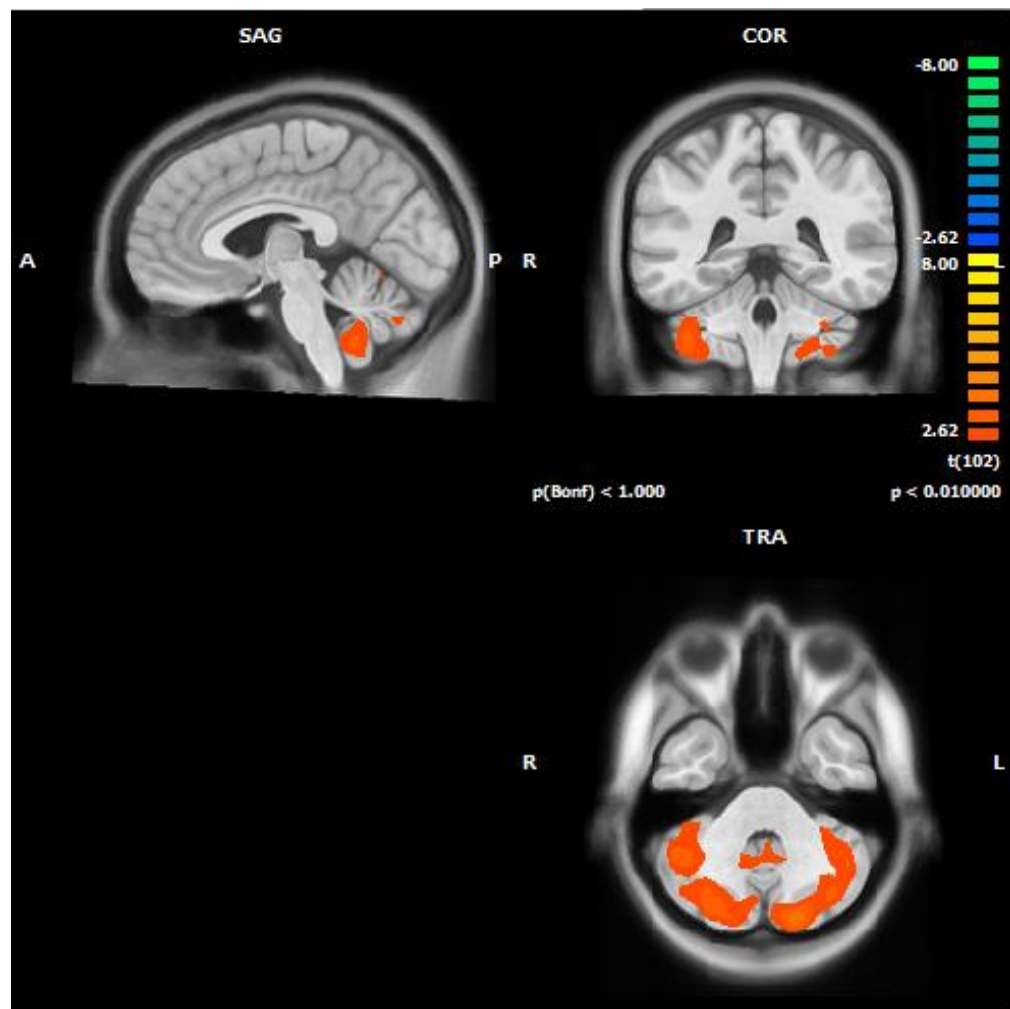
L/Vermis/R Villa



# Results PERFUSION

| Only volume | GROUP but NO volume | Group AND Volume | None           |
|-------------|---------------------|------------------|----------------|
| L/R I-IV    | L Crus I            | L Crus II        | Vermis Crus I  |
| L/R V       | R Crus I            | R Thalamus       | Vermis Crus II |
| L/R VI      | R Crus II           | L Thalamus       | L VIIa         |
| Vermis VI   | L VIIb              |                  | L VIIb         |
| Vermis VIIb | R VIIb              |                  | Vermis VIIIb   |
| Vermis VIIa | RVIIa               |                  | L IX           |
| Vermis IX   | RVIIIb              |                  | L/R pallidum   |
| R IX        | L Caudate           |                  | L/R putamen    |
| L/R X       | R Caudate           |                  |                |
| Vermis X    |                     |                  |                |

# Whole brain comparison of CBF maps



# Conclusion

## Efficacy of the model

Accuracy in classification of MSA patients is 62-74%

Accuracy in classification of PD patients is 40-80%