

**Energy expenditure, body composition and dietary habits in progressive supranuclear palsy: a case-control study**

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*Introduction:* Recent evidence suggests that neurodegenerative diseases are associated with a wide spectrum of metabolic changes [1-3]. However, the nature of these metabolic changes and how they can affect disease progression are largely unknown.

*Objective:* Goals of the present study were to (1) investigate whether progressive supranuclear palsy (PSP) at early stages is associated with changes in energy expenditure, body composition and dietary intake compared with PD patients and healthy controls (HC); (2) assess the accuracy of the equation of Harris-Benedict, constructed to estimate rest energy expenditure (eREE) in healthy individuals, to predict measured REE (mREE) in PSP; (3) verify differences in the above-mentioned variables according to pre-specified categories in the PSP cohort (phenotypes, disease severity and presence of clinically significant dysphagia).

*Methods:* Twenty-one PSP, 41 PD and 9 HC were included. REE was assessed with indirect calorimeter, body composition with bioimpedance analysis and physical activity and dietary intake were estimated with a validated frequency questionnaire. Parametric testing was used to analyze differences between group.

*Results:* On a group-level, PSP showed reduced total daily energy expenditure (TDEE) and physical activity compared to both PD and HC ( $p < 0.001$ ) and a tendency towards lower fat free mass compared to PD ( $p > 0.05$ ). Limited accuracy was shown for the Harris-Benedict equation (accurate prediction frequency  $< 60\%$ ). PSP with greater disease severity presented lower REE ( $p = 0.030$ ), fat free mass ( $p = 0.026$ ) and muscle mass ( $p = 0.029$ ).

*Conclusions:* PSP present lower TDEE possibly linked to reduced mobility compared with PD and HC. Greater disease severity is associated with a reduction in REE possibly due to the reduction in lean mass and muscle mass. Such data may pave the way to clinical trials evaluating the efficacy of muscle-targeted nutritional support and physical therapy in preserving muscle mass and improving motor performances in PSP at early stages.

**References**

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