

Frail elderly people' impaired anticipatory cognitive brain processing

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Frailty in older people is a multisystem physiological state associated with poor clinical and functional outcomes (1; 2). This condition may be associated with cognitive decline due to impairment of brain processes and structures, particularly in the prefrontal cortex (PFC) (3). There is currently a dearth of study on cognitive function and brain activity in frailty, despite the high condition's prevalence. The current study examined the frontal and prefrontal brain activity in pre-frail and frail older individuals during the anticipatory phase of a cognitive task using the event-related potential (ERP) approach. ERPs were compared between frail or pre-frail participants (Frail group) and matched healthy individuals (Robust group), all aged ≥ 65 . The Montreal Cognitive Assessment (MoCa) was used to evaluate cognitive abilities, while the State-Trait Anxiety Inventory (STAI) was used to measure anxiety. The PFC activity was 41% lower in the Frail group compared to the Robust group. Due to this loss of top-down cognitive control, frail individuals may have made more mistakes in their responses (+34%) and had higher levels of anxiety (+17%) compared to the Robust group. The cognitive preparation required to perform accurate task may be reduced due to the PFC degeneration as revealed in this study. Frail individuals may also have elevated anxiety levels as a result of this PFC hypoactivity. This finding was identical in pre-frail and frail people, suggesting that the PFC's anticipatory ERP activity may be an early neuromarker of frailty.

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