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The association between dietary protein and handgrip strength in Finnish older adults: Evidence from a prospective population-based health survey

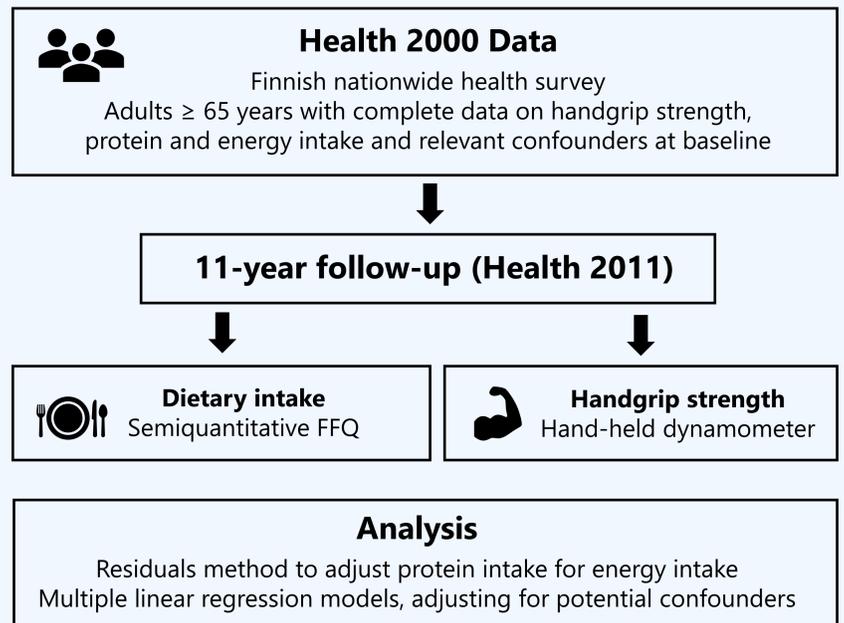
Background

- **Age-related loss of muscle mass and strength** contributes to functional decline, morbidity and mortality in older adults [1-3]
- **Amino acid availability** plays a fundamental role in muscle health and function via the stimulation of muscle protein synthesis [4,5]
- Older adults exhibit **anabolic resistance**, potentially requiring higher protein intake to achieve comparable responses in muscle protein synthesis [6]
- However, evidence on the association between dietary protein intake and muscle strength remains **inconsistent**, and optimal intake levels are debated [7-10]

Aim

To investigate the association between dietary protein intake and handgrip strength and its decline over 11 years in older Finnish adults.

Methods



Results

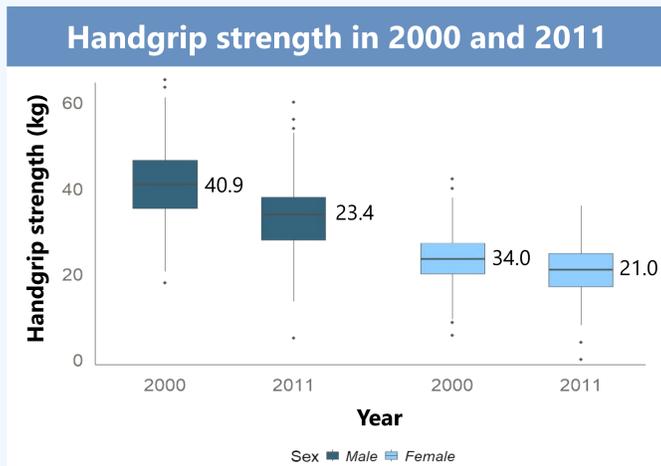


Figure 1: Handgrip strength (median, kg) at baseline and follow-up

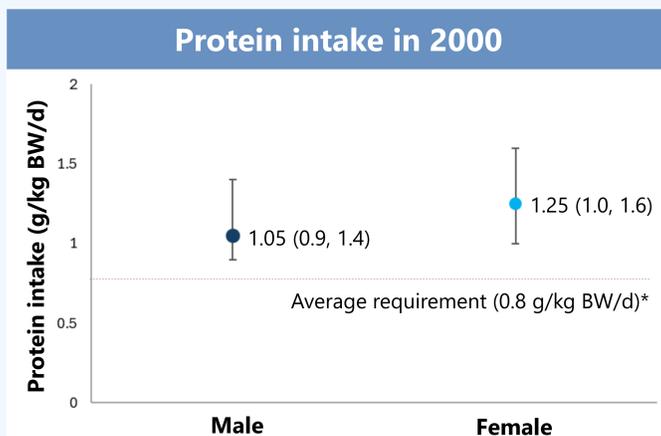


Figure 2: Median protein intake (Q1, Q3; g/kg BW/day) at baseline
*According to Nordic Nutrition Recommendations 2023 [11]

- Baseline sample (year 2000): $n = 597$, 62% female, median age 70 years
- Follow-up sample (year 2011): $n = 348$, 60% female
- **No significant association** between protein intake and handgrip strength at baseline or change in handgrip strength after adjustment
- Baseline handgrip strength: Significantly associated with age, sex, body mass index, limitations in activities of daily living and muscle mass
- Decline in handgrip strength over follow-up: Significantly associated with age, baseline strength and muscle mass

Association between energy-adjusted protein intake and handgrip strength

Baseline handgrip strength

Crude	-0.075 (-0.135, -0.015)
Adjusted	-0.009 (-0.041, 0.024)

Handgrip strength change (2000 – 2011)

Crude	0.066 (0.02, 0.112)
Adjusted	0.024 (-0.017, 0.066)

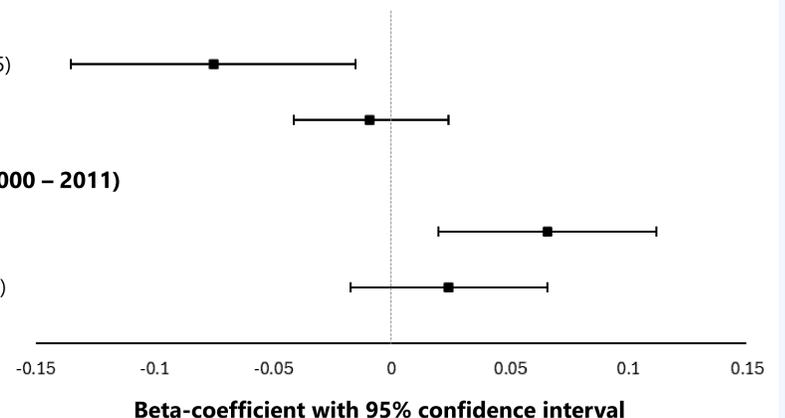


Figure 3: Forest plot of regression model beta-coefficients for the cross-sectional and longitudinal association; unadjusted and after multivariate adjustment. Final model adjusted for age, sex, baseline handgrip strength, alcohol intake, physical activity, smoking, body mass index, comorbidities, limitations in activities of daily living (ADL) and muscle mass

Conclusion

After multivariable adjustment, dietary protein intake was not independently associated with handgrip strength or its decline in this cohort of well-nourished, community-dwelling older Finnish adults. Age-related loss of muscle strength is multifactorial, and while ensuring adequate protein intake remains important, it should be considered alongside other factors such as physical activity, body composition, and overall health.



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