

# TOTAL ANTIOXIDANT CAPACITY AND FRAILITY IN OLDER MEN

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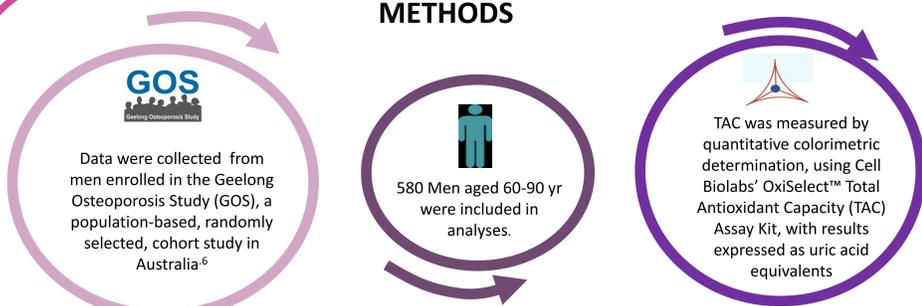
## BACKGROUND

- ❖ Frailty is a clinical syndrome characterised by multisystem dysregulation resulting in adverse health outcomes such as falls and fractures.<sup>1</sup>
- ❖ The pathophysiology of frailty is complex and not well understood, as it involves multiple physiological systems and biological factors.<sup>2</sup>
- ❖ Evidence has emerged that shows that oxidative stress plays a role in the development of frailty.<sup>3,4</sup>
- ❖ A recent systematic review demonstrated higher peripheral oxidative stress biomarkers and lower anti-oxidant factors in frail older adults.<sup>2</sup>
- ❖ Although an association has been observed, the direction this relationship is mixed with some studies showing either a higher or lower antioxidant levels in frail individuals while others showed no significant differences.<sup>2,5</sup>

## OBJECTIVE

- ❖ We investigated the association between serum total antioxidant capacity (TAC) and frailty in older men.

## METHODS



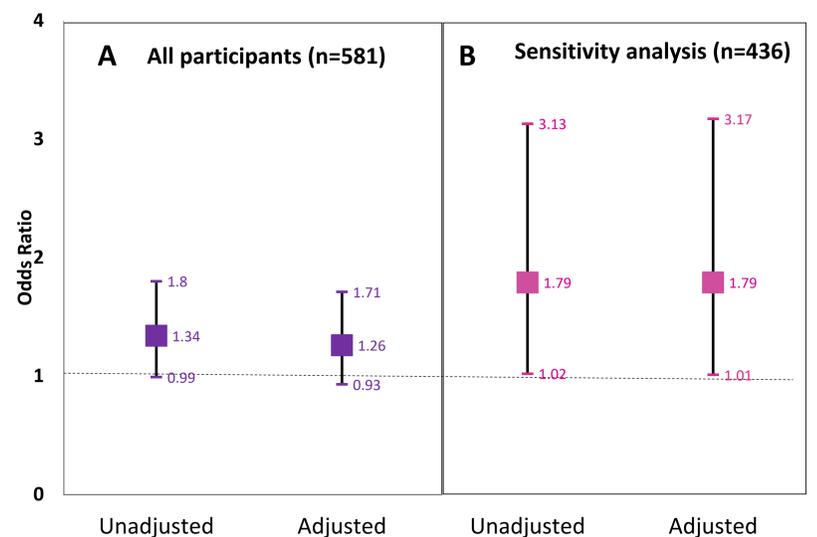
- ❖ Participants were categorised as either “non-frail” (robust and pre-frail pooled) or ‘frail’ using a modified Fried frailty phenotype<sup>1</sup>. This tool identifies frailty by the presence of three or more of the following: unintentional weight loss, exhaustion, low physical activity, slowness and weakness.
- ❖ TAC values were expressed as standard deviation (SD) units in Pearson’s correlation tests and multivariable logistic regression models for determining their relationship with frailty. Adjustments for potential confounders and effect modifiers including age, BMI, smoking, alcohol were made.
- ❖ A sensitivity analysis excluded participants in the upper quartile of TAC, who were likely to have hyperuricemia.<sup>5</sup>

**Table**

Participant characteristics stratified by frailty status. Data presented as median (IQR), means (±SD) or n (%)

	All	Frail		P-value
	n=581	Y (n=50)	N (n= 531)	
Age (yr)	74 (67-83)	78 (72-83)	74 (67-81)	<b>0.004</b>
BMI (kg/m <sup>2</sup> )	27.4 ± 4.0	28.1 ± 5.3	27.2 ± 3.9	0.158
Alcohol*	107 (18%)	9(18%)	98(18%)	0.927
Smoking	41 (7%)	5(10%)	36(7%)	0.395
Total antioxidant Capacity	5.292±0.984	5.549 ± 0.929	5.268 ± 0.987	<b>0.054</b>

\* Missing data for alcohol consumption > 2.99g/day (2 participants)



**Figure** : Odds ratios (95% Confidence intervals) for TAC in association with frailty. Models were adjusted for age and BMI

## RESULTS

- ❖ Among 581 men, 50 (8.6%) were frail. TAC was weakly correlated with age ( $r=0.07$ ,  $p=0.1$ ) and BMI ( $r=0.1$ ,  $p=0.01$ ). (Table)
- ❖ Higher TAC was associated with increased likelihood of frailty. For each 1 SD increase in TAC the OR was 1.34 (95%CI 0.99-1.80), with borderline significance. Adjustment for age and BMI attenuated the association (OR 1.26, 95%CI 0.93-1.71). (Figure A). No effect modifiers or other confounders were identified.
- ❖ Sensitivity analysis that excluded 145 men, revealed a positive association between TAC and frailty, which was significant before (OR 1.79, 95%CI 1.02-3.13), and after adjustment for age and BMI (OR 1.79, 95%CI 1.01-3.17). (Figure B)

## CONCLUSION

- ❖ These results suggest a positive association between TAC levels and frailty, supporting the notion that this biomarker could be useful in identifying individuals at risk of frailty.
- ❖ We speculate that a milieu of heightened oxidative stress in frailty may elevate the oxidative stress regulatory set-point, raising antioxidant activity. This finding warrants further investigation.

## REFERENCES

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