

Is The Apoe ϵ 4 Allele Associated With Poorer Cognitive Outcomes In Older Adults Following Covid-19 And Other Respiratory Infections?

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Background

There is a knowledge gap regarding how the APOE ϵ 4 allele (Apolipoprotein E), a well-established genetic risk factor for Alzheimer's Disease, influences the long-term development and exacerbation of cognitive deficits following respiratory tract infections in the elderly population. The present study evaluates the association between the presence of the APOE ϵ 4 allele and poorer cognitive outcomes following hospital discharge for Lower Respiratory Tract Infections (LRTI) caused by COVID-19 or other pathogens.

Methods

This is a cross-sectional study nested within a prospective cohort that recruited older adults following laboratory-confirmed LRTI between 2021 and 2025. Cognitive diagnosis was established through clinical judgment by a geriatrician and an occupational therapist, laboratory tests, neuroimaging, and the following instruments: the Mattis Dementia Rating Scale (MDRS) and the Alzheimer's Disease Cooperative Study-Activities of Daily Living (ADCS-ADL) scale. The presence of the APOE ϵ 4 allele was determined using the RT-PCR method. Statistical analysis was performed using Mann-Whitney and Chi-square tests.

Results

The sample consisted of 85 participants assessed 6.53 $\pm$ 3.36 months after LRTI; the mean age was 73.58 $\pm$ 9.75 years, with 7.85 $\pm$ 4.71 years of education and a Charlson Comorbidity Index of 1.78 $\pm$ 1.78. Of the participants 75.29% had COVID-19 and 24.71% had other LRTIs. The APOE ϵ 4 allele was present in 28.13% of the sample and was associated with length of hospital stay ($p=0.048$), ICU admission ($p<0.001$), and depressive symptoms ($p=0.028$). The rates of preserved cognition, mild cognitive impairment (MCI), and dementia were 22.89%, 61.45%, and 15.66%, respectively, but no association was found with the presence of the ϵ 4 allele ($p=0.727$).

ASSOCIATION WITH APOE E4	P-VALUE
Lenght of hospital stay	0.048
ICU admission	<0.01
Depressive symptoms	0.028
Cognitive outcomes	0.727

Conclusions

The APOE ϵ 4 allele was associated with LRTI severity during the acute phase and with the presence of depressive symptoms six months post-infection. However, no association was found between the allele and cognitive outcomes. Prospective studies with long-term follow-up are necessary to address this knowledge gap.

References

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