Title: The effects of non-modifiable risk factors of Alzheimer's disease (AD) on plasma pTau217 Concentrations

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Background

Plasma pTau217 is a reliable biomarker for diagnosing AD. Age, sex, and ApoE e4 genotype are among the non-modifiable risks of AD, but limited data is available about their effects on plasma pTau concentrations. The current study examined the relationship between Age, sex, and ApoE e4 allele on plasma pTau271 levels in patients with pathologically diagnosed AD compared to non-AD.

Methods

A cohort consisted of autopsy-diagnosed cases referred to the UBC Hospital Clinic for AD

- AD (n= 70)
- non-AD (n=44)

EDTA plasma sample

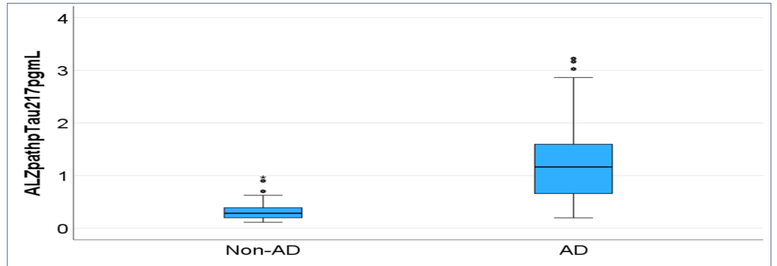
- The pTau217 levels were measured using commercially available immune assays, ALZpath Simoa pTau 217 v2 kits (Quanterix, MA USA) on the Quanterix HD-X Analyzer platform
- ApoE genotyping was performed on extracted DNA from blood samples

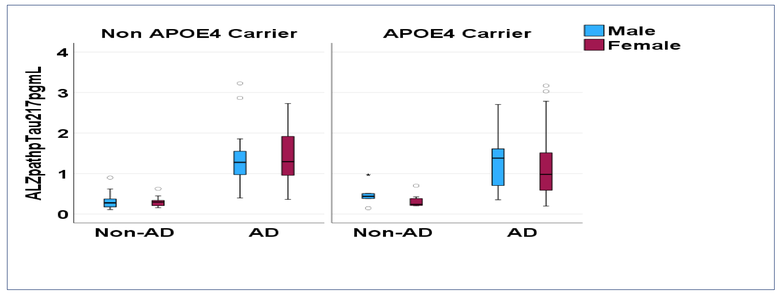
We examined the effects of age, sex, and ApoE4 on plasma pTau217 concentrations using a linear regression model by SPSS 29

Results

Plasma p-tau217 concentrations (pg/ml)

	N	Mean	SD
Non-AD	45	0.33	0.19
AD	70	1.28	0.74
Male	61	0.88	0.72
Female	54	0.94	0.8
Non APOE4 Carier	60	0.79	0.75
APOE4 Carier	55	1.03	0.75





Dependent Variable: ALZpathpTau217pgmL

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	24.889[a]	4	6.222	17.292	<.001
Intercept	3.765	1	3.765	10.463	.002
Sex	.032	1	.032	.088	.767
APOE4Caarier	.198	1	.198	.550	.460
Age at death	.363	1	.363	1.009	.317
Alzheimer Disease	21.541	1	21.541	59.864	<.001
Error	39.221	109	.360		
Total	159.002	114			
Corrected Total	64.109	113			

a. R Squared = .388 (Adjusted R Squared = .366)

Results

- The plasma concentrations of pTau217 in AD cases were approximately four times higher than in non-AD cases , independent of sex, age, and ApoE ε4 status ($p < 0.001$).
- The mean plasma pTau217 concentration was 0.9 ± 0.7 pg/ml in males compared to 0.9 ± 0.8 pg/ml in females ($p = 0.7$).
- For ApoE ε4 status, the plasma pTau217 concentration was 0.8 ± 0.75 pg/ml in non-carriers compared to 1 ± 0.75 pg/ml in carriers ($p = 0.9$).
- There was no significant independent effect of age ($p = 0.3$), sex ($p = 0.8$), or ApoE ε4 status ($p = 0.5$) on plasma pTau217 levels.
- There were also no statistically significant interactions observed between AD and sex ($p = 0.9$), AD and ApoE ε4 carrier status
- ($p = 0.3$), sex and ApoE ε4 status ($p = 0.65$), or AD and age ($p = 0.7$) on plasma pTau217 concentrations.

Conclusion

Our findings suggest that non-modifiable risk factors of AD do not affect plasma pTau271 concentrations significantly, independent of the AD clinical status.

References

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