

Investigating the risk of cardiovascular risk factor subgroups on Alzheimer's disease: *a latent class approach*

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Study Sample and Objectives:



THE NIA ALZHEIMER'S DISEASE RESEARCH CENTERS PROGRAM
National Alzheimer's Coordinating Center

N=12, 412 cognitively normal elderly
Recruited from 39 Alzheimer's disease Research
Centers across the US

Objective 1:

Identify phenotypes of CVRFs in cognitively normal elderly (*approach: latent class analysis*)



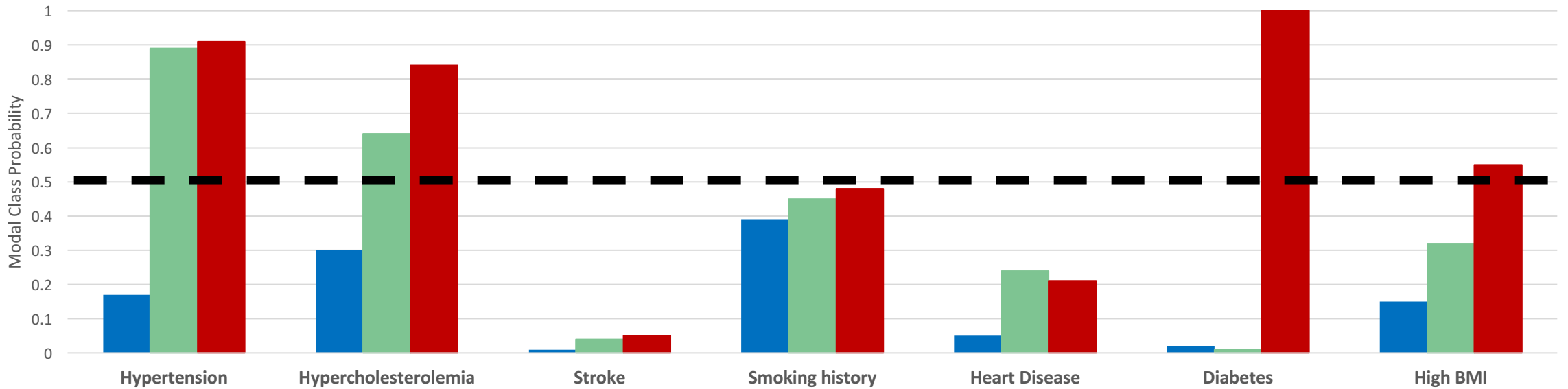
Objective 2:

Identify differences in incident AD and death between groups

Table 1: Study participant characteristics (mean(SE), or N(%))

Demographics	
Age	70.9 (10.5)
Sex (Male)	431 (35%)
Education (yrs)	15.9 (2.9)
MMSE	28.9 (1.4)
Cardiovascular Risk Factors	
Hypertension	6745 (54%)
High Cholesterol	6136 (49%)
Smoking history	5237 (42%)
High BMI (>30 kg/m ²)	2976 (26%)
Heart-related condition	1784 (14%)
Diabetes	1373 (11%)
Stroke/TIA	291 (2%)
Other	
E4 Allele (presence)	3341 (27%)
Progressed to AD	788 (6%)
Duration of follow-up	65 months

Objective 1: Identify phenotypes of CVRFs in cognitively normal elderly



Class 1: Reference group (N=5398)

- None

Class 2: Vascular-dominant phenotype (N=5721)

- Hypertension
- Hypercholesterolemia

Class 3: Vascular/metabolic phenotype (N=1293)

- Hypertension
- Hypercholesterolemia
- Diabetes
- High BMI

Table 2: Between group comparisons (mean(SE), or N(%))

	Reference Group	Vascular-dominant	Vascular/metabolic
Age	66.6 (1.2)	75.5 (.7)	72.2 (.6)
Education (yrs)	16.9 (.3)	15.8 (.2)	15.3 (.3)
MMSE	29.1 (.04)	28.7 (.1)	28.5 (.1)
Sex (Male)	29%	40%	39%
E4 allele presence	32%	29%	30%

□ : p<.05

■ : p<.001

Objective 2: Differences in incident AD and death between groups

Incidence of AD:

Reference Group	Vascular-dominant	Vascular/metabolic
5%	9%	7%

Vascular-dominant vs ref:

OR = 1.74, 95% CI: 1.28 – 2.36, p<.001

Vascular/metabolic vs. ref:

OR= 1.30, 95% CI: .94 – 1.80, p=.11

Incidence of death:

Reference Group	Vascular-dominant	Vascular/metabolic
2.4%	8%	4%

Vascular-dominant vs ref:

OR = 3.26, 95%CI: 2.40 - 4.43, p<.001

Vascular/metabolic vs. ref:

OR: 3.12, 95% CI: 2.35– 4.14, p<.001

Post-hoc analyses: Role of selective mortality

Death without AD:

Reference Group	Vascular-dominant	Vascular/ Metabolic
5.7%	16.8%	15.9%

Vascular-dominant vs. ref :

OR: 3.31, 95%CI: 2.45-4.74, p<.001

Vascular/metabolic vs. ref:

OR: 3.12, 95%CI: 2.35-4.14, p<.001

Alive with AD:

Reference Group	Vascular-dominant	Vascular/ Metabolic
2.8%	4.3%	4.1%

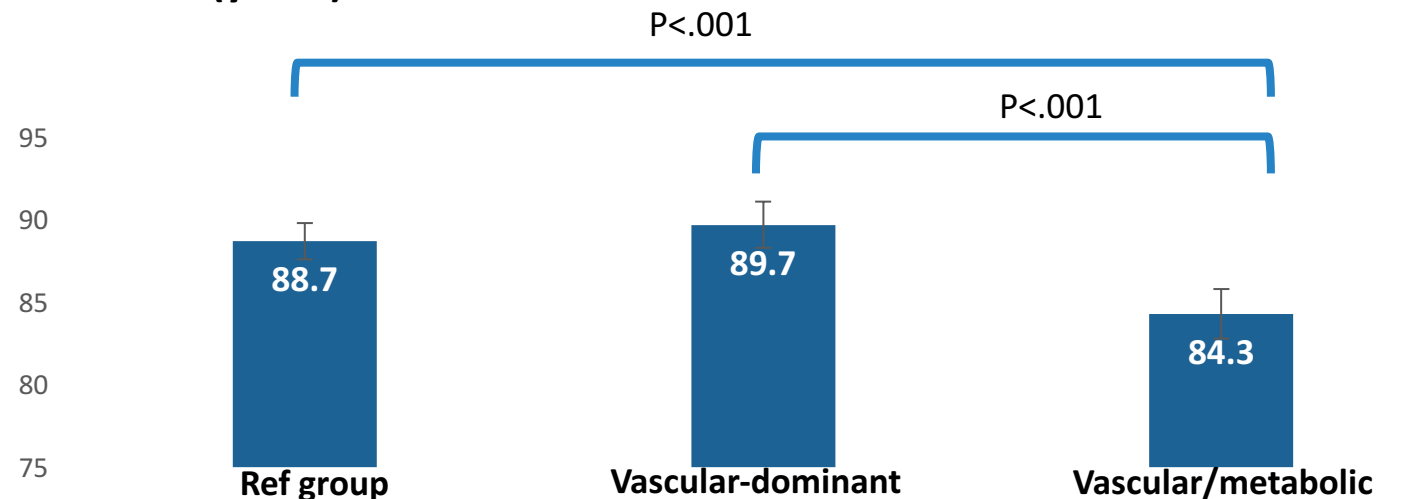
Vascular-dominant vs. ref:

OR: 1.54, 95%CI: 1.09-2.12, p=.02

Vascular/metabolic vs. ref:

OR: 1.46, 95%CI: 1.01-2.11, p=.04

Age at death (years):



Final Remarks:

Class 1: Reference group	Class 2: Vascular-dominant group	Class 3: Vascular/metabolic CVRFs
<ul style="list-style-type: none">• None	<ul style="list-style-type: none">• Hypertension• Hypercholesterolemia	<ul style="list-style-type: none">• Hypertension• Hypercholesterolemia• Diabetes• High BMI

Incidence of AD from greatest to lowest:

vascular dominant group* > vascular metabolic group > reference group

*Selectivity mortality a likely contributor

Using derived LCA model:

-Investigate AD-related biological differences between groups

-Investigate differences in efficacy of cardiovascular medications on cognition

-Enlist other major datasets to confirm reliability and generalizability of derived model in the presence in race/ethnic, socioeconomic status, educational differences