SCHOOL OF MEDICINE

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The Fluidity of MCI and the Role of Vascular Biomarkers in Predicting Progression Results from the Indianapolis-Ibadan Study

Hugh Hendrie, MB, ChB,DSc
Indiana University Center for Aging Research
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Predicting and Measuring Progression in Early AD

Conflicts of Interest

None

Presentation

- Part 1 - Incidence, Progression, and Reversion of MCI in elderly African Americans
- Part 2 - Risk Factors for MCI conversion to Dementia in African Americans and Yoruba with emphasis on Cardiovascular Biomarkers

Part 1

Incidence, Progression, and Reversion of MCI in elderly African Americans

Study Design

Stage 1

Community Screening
CSI "D"
All Community subjects from previous wave of the study excluding those diagnosed with dementia

CSI "D"
Good Performance
5%

CSI "D"
Intermediate Performance
or
Small Decline
50%

CSI "D"
Poor Performance
Or
Greater Decline
100%

Previously Diagnosed with Cognitive Impairment
100%

Stage 2

Clinical Assessment

- Neuropsychological
- Informant Interview
- Laboratory Tests
- Neurological Assessment
- Medical Records when Available
- Clinician Home Interview Function

Consensus Diagnosis Conference

- Dementia: DSM-IV
- MCI: Cognitive deficit on testing, from informant report, or clinical evaluation with generally preserved IADL.

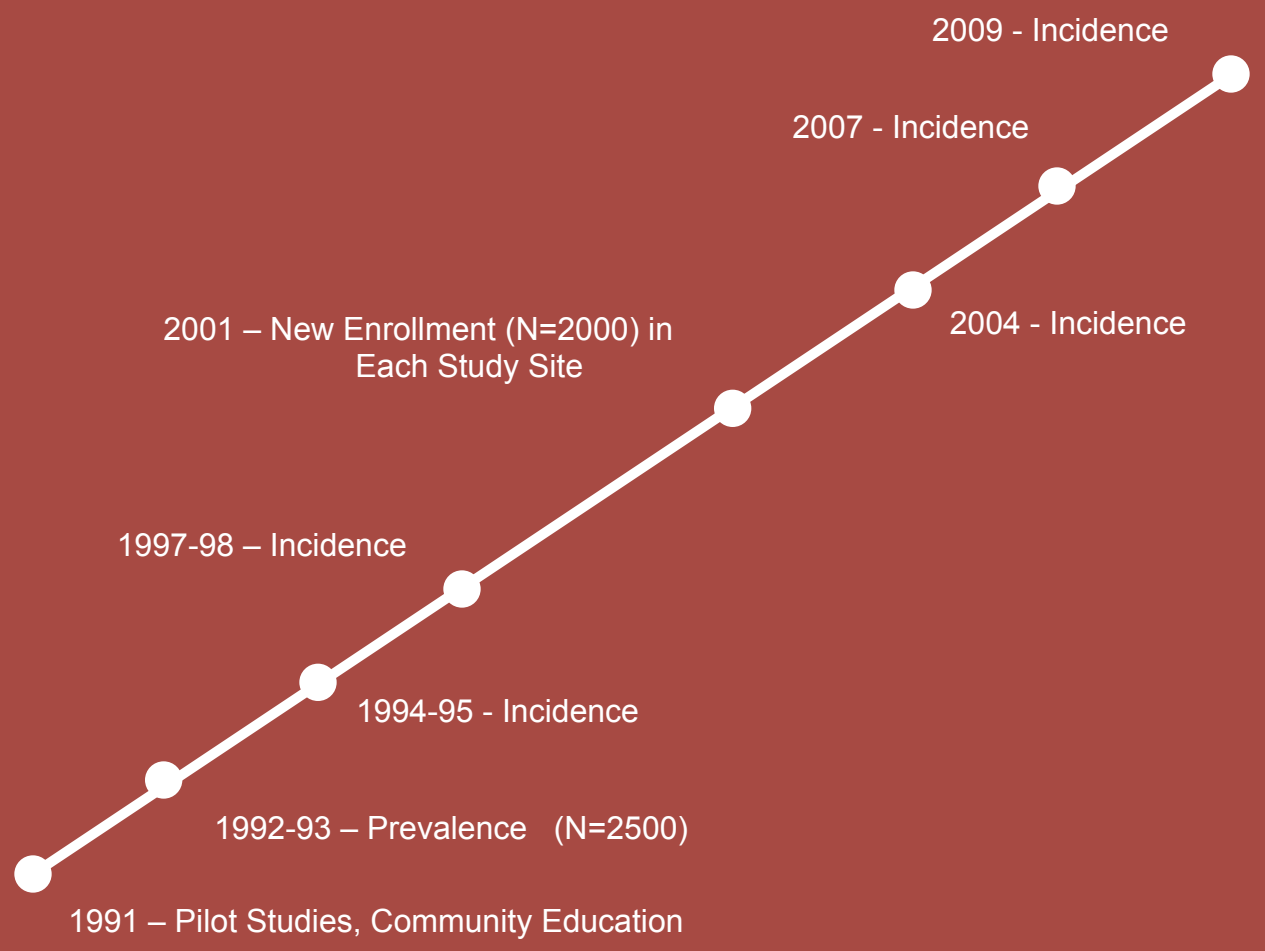
Design for MCI Transition Analysis

- 2147 participants without dementia in 1992. 1835 participants without dementia in 2001. Total n= 3982.
- Participants in the 1992 cohort evaluated up to 7 times over 17 years. 2001 cohort up to 4 times over 8 years.
- Each transition was included.
- Diagnosis of dementia was clinical end point.

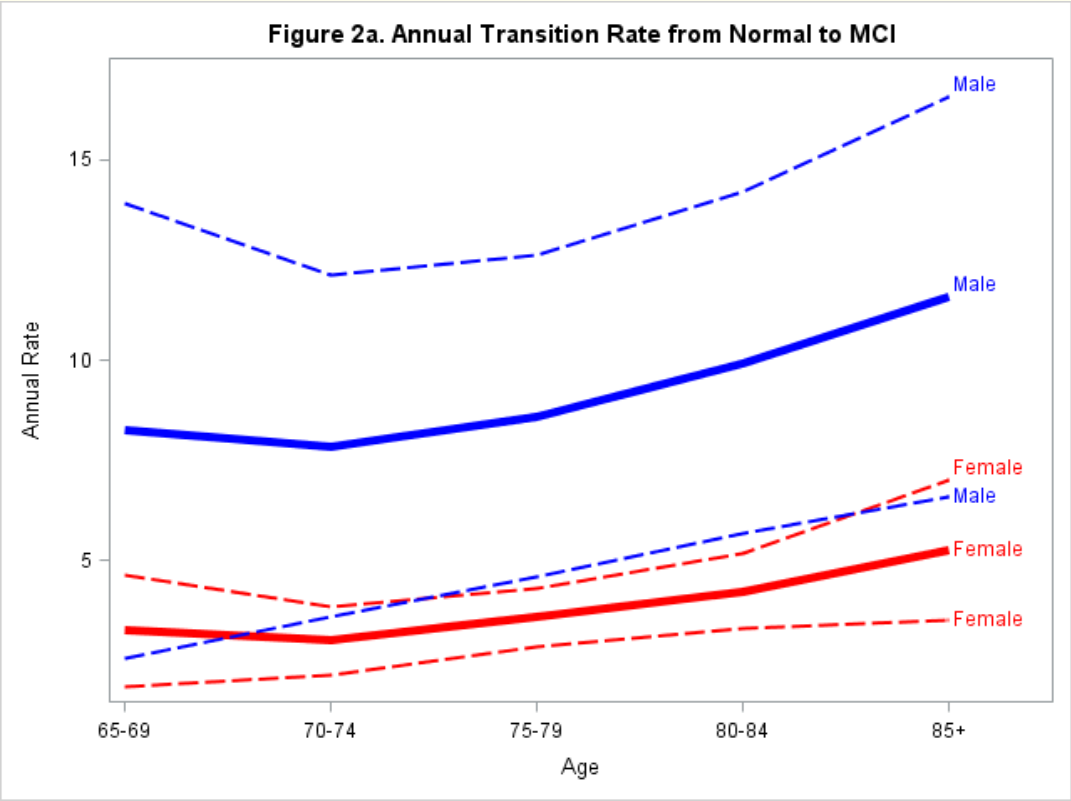
Baseline Characteristics of Participants Enrolled in 1992 and 2001

	1992 Cohort	2001 Cohort
	Overall n=2147	Overall n=1835
Age, mean (SD)	74.3 (6.9)	77.2 (5.5)
Female, n(%)	1396 (65)	1201 (65.4)
Years of Education, mean (SD)	9.7 (3.1)	11.4 (2.7)

Indianapolis – Ibadan Dementia Project



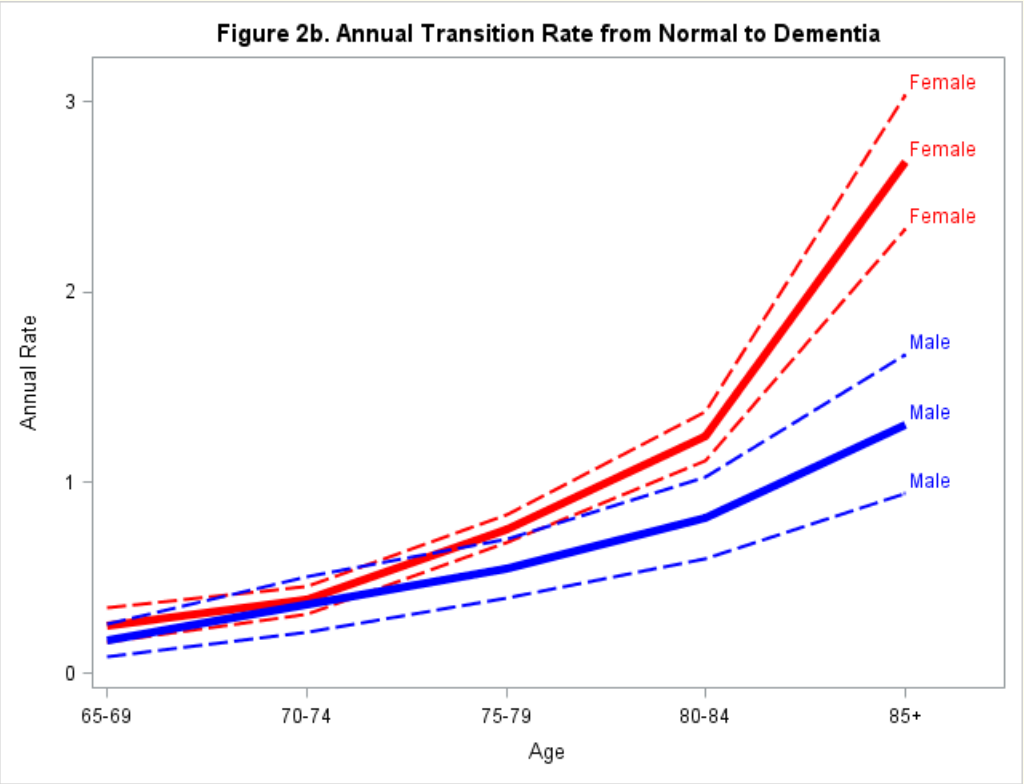
Normal to MCI Transition



Age Group	Rate
65-69	3.3
70-74	3.0
75-79	3.6
80-84	4.2
85+	5.3
65-69	8.2
70-74	7.9
75-79	8.6
80-84	9.9
85+	11.6

Overall Standardized Rate 5.6

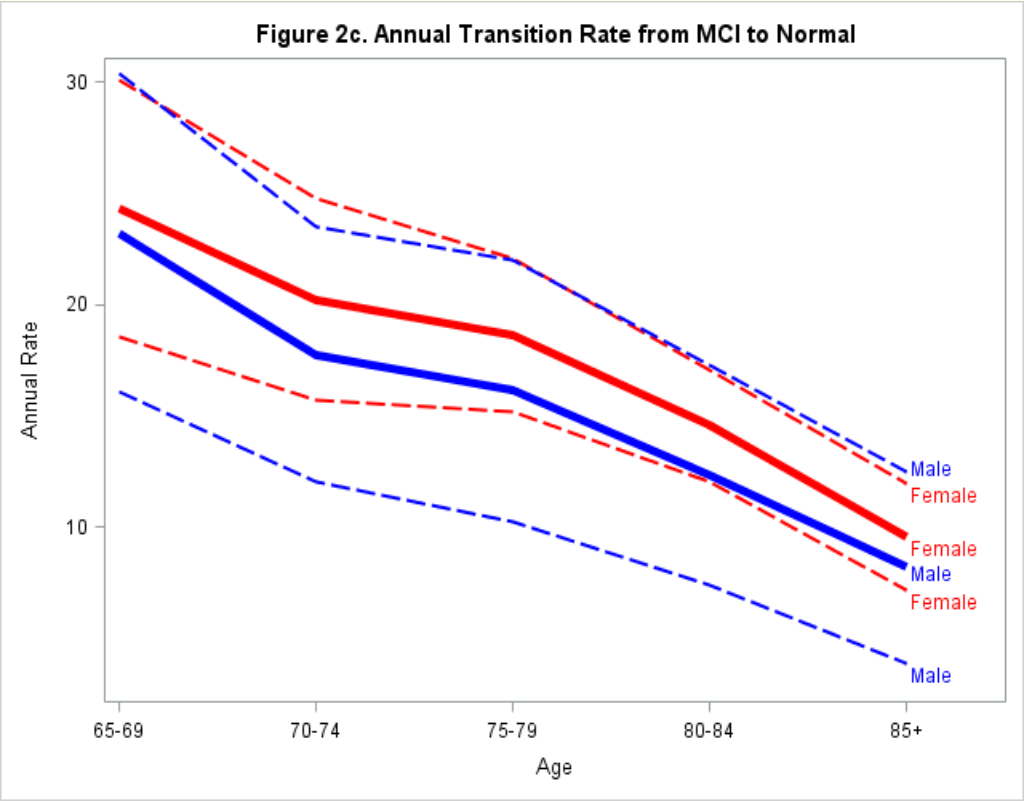
Normal to Dementia Transition



Age Group	Rate
65-69	**0.3**
70-74	**0.4**
75-79	**0.8**
80-84	**1.2**
85+	**2.7**
65-69	**0.2**
70-74	**0.4**
75-79	**0.5**
80-84	**0.8**
85+	**1.3**

Overall Standardized Rate 0.7

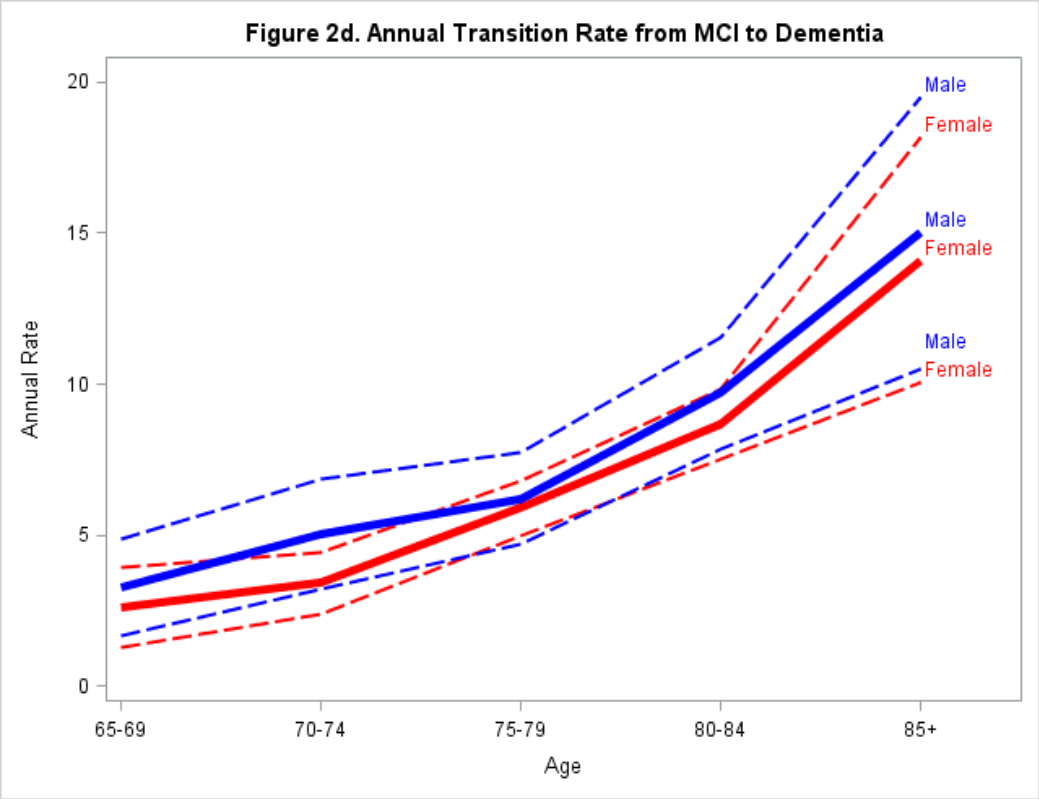
MCI to Normal Transition



Age Group	Rate
65-69	**24.3**
70-74	**20.2**
75-79	**18.6**
80-84	**14.6**
85+	**9.6**
65-69	**23.2**
70-74	**17.8**
75-79	**16.1**
80-84	**12.3**
85+	**8.2**

Overall Standardized Rate 18.6

MCI to Dementia Transition



Age Group	Rate
65-69	**2.6**
70-74	**3.4**
75-79	**5.9**
80-84	**8.7**
85+	**14.1**
65-69	**3.3**
70-74	**5.0**
75-79	**6.2**
80-84	**9.7**
85+	**15.0**

Overall Standardized Rate 5.9

Conclusions

- Transitions to both normal and dementia are common in MCI.
- Progression to dementia more common in the very old.

Part 2

Risk Factors for MCI conversion to Dementia in African Americans and Yoruba with emphasis on Cardiovascular Biomarkers

Putative Risk Factors Biomarkers: 2001

- PAI-1
- Cholesterol
  (total, HDL, LDL, triglycerides)
- E Selection
- Folate
- Glucose
- Human C-Reactive Protein
- Homocysteine
- HDL
- LDL
- Insulin
- P8 Isoprostane
- Triglycerides
- TSH
- Vitamin B12

Putative Risk Factors Other: 2001

- Demographics
- Lifestyle (alcohol, smoking)
- Comorbidities
- APOEEE Genotypes

Final Diagnoses Outcomes of 154 Elderly African Americans with MCI 2001 – 2009

(lost to follow-up = 65)

Final Diagnoses	Frequency	%
N/CI	46	52
D	43	48

Significant (p<.1) Risk Factors for Conversion to Dementia African Americans (2001 - 2009)

	Total N	N/CI Mean ± SD	D Mean ± SD	Odds Ratio	95% CI	P-value
Insulin	68	1.23 ± 1.70	0.54 ± 0.50	0.45	0.21 – 0.97	0.0418

	Total N	N/CI %	D %	Odds Ratio	95% CI	P-value
Alcohol Use	77	60.00	40.54	0.45	0.18 – 1.13	0.0900
FH of Dementia	88	4.44	18.60	4.91	0.98 – 24.64	0.0530
Heart Problems	89	43.48	20.93	0.34	.013 – 0.88	0.0258
Smoking History	88	66.67	48.84	0.48	0.20 – 1.13	0.0923

Final Diagnoses Outcomes of 231 Elderly Yoruba with MCI 2001 – 2009

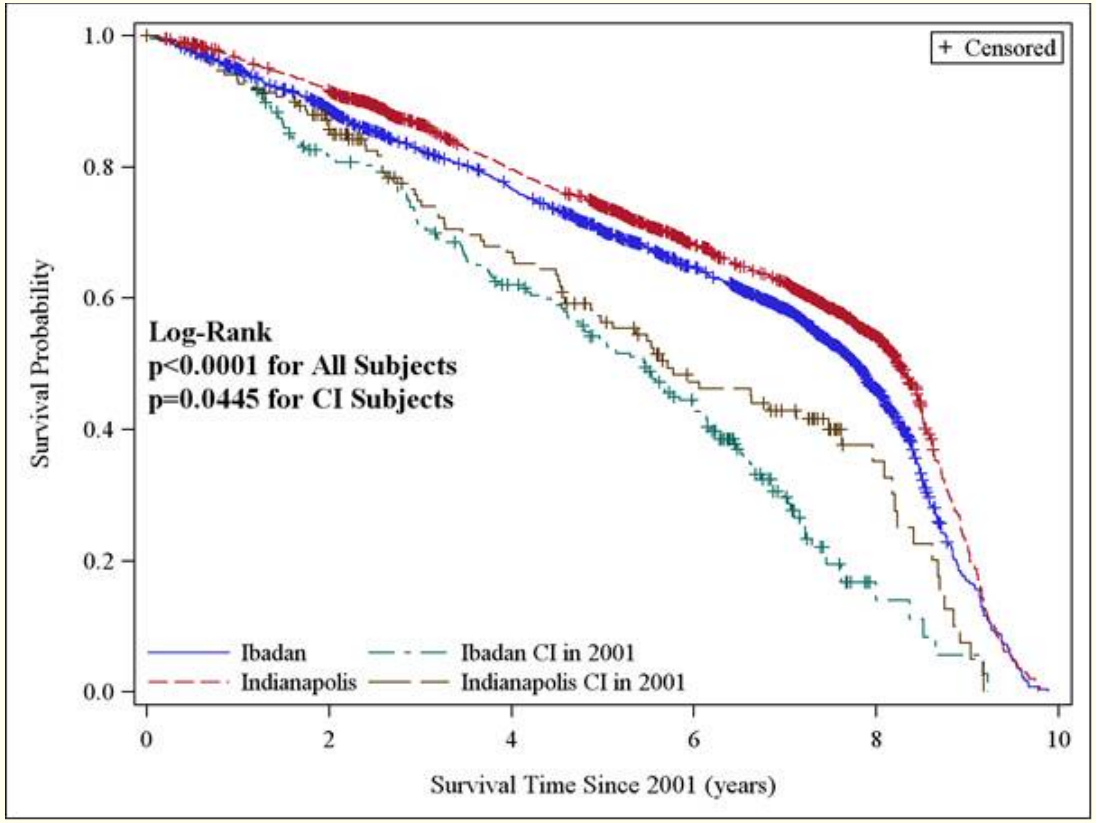
(lost to follow-up = 74)

Final Diagnoses	Frequency	%
N/CI	110	70
D	47	30

Significant (p<.1) Risk Factors for Conversion to Dementia Yoruba (2001 - 2009)

	Total N	N/CI Mean ± SD	D Mean ± SD	Odds Ratio	95% CI	P-value
Age at Baseline	157	77.85 ± 5.03	80.93 ± 7.24	1.09	1.03 - 1.16	0.0042

Comparison of Survival Curves Between African Americans and Yoruba for all participants with and without MCI (2001 – 2009)



Conclusions

Single measurements of cardiovascular biomarkers did not significantly improve predictive power for MCI conversion to dementia in elderly African Americans or Yoruba.

Acknowledgements

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And the Members of the Indianapolis-Ibadan Team