Alzheimer's Disease Neuroimaging Initiative

Neuropathology Core

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Table 1. Participants Autopsied per Funding Period

ADNI Funding Period	ADNI-NPC	Deaths	Autopsies	Annual Autopsy Rate (%)
9-1-05 to 8-31-07	NO	6	0	0
9-1-07 to 8-31-08	YES	7	2	28
9-1-08 to 8-31-09	YES	8	8	100
9-1-09 to 8-31-10	YES	4	1	25
9-1-10 to 8-31-11	YES	13	6	46
9-1-11 to 8-31-12	YES	4	3	75
9-1-12 to 8-31-13	YES	15	8	53
9-1-13 to 8-31-14	YES	20	13	65
9-1-14 to 8-31-15	YES	17	11	65
9-1-15 to 8-31-16	YES	24	12	50
9-1-16 to 04-14-16	YES	10	7	70
Total (2005-2016)	-	128	71	55
Total since NPC established	-	122	71	58

Note: The ADNI-NPC was established on 9/1/2007. Figures based upon ADNI participants who died as active participants as well as those no longer actively seen due to protocol changes or advanced dementia.

Table 2. Neuropathologic Diagnosis

Clinical Diagnosis	Neuropathologic Diagnosis [N (%)]											
	AD	AD +DLB	AD +TDP	AD +DLB +TDP	AD+DLB +TDP +AGD	AD +ALB	AD + AGD	AD +HS	AD+TDP +Infarcts	AD +PSP	AGD +PART	TOTAL (%)
ADD	19*	14**	3§	4§	2§	3	1	3†	1		2	52 (91)
ADD +DLB				1	1	2‡						4 (7)
PSP¶										1		1 (2)
TOTAL (%)	19 (35)	14 (25)	3 (5)	5 (9)	3 (5)	5 (9)	1 (2)	3 (5)	1 (2)	1 (2)	2 (4)	57 (100)

ADD Diagnostic accuracy: 54/56 (96.4%)

ADD, Alzheimer disease dementia; AD (NIA-AA score: A1, B0, C0 or greater); ALB, AD with amygdala Lewy bodies; DLB, dementia with Lewy bodies; AGD, argyrophilic grain disease; TDP, AD with TDP-43 proteinopathy in medial temporal lobe; HS, hippocampal sclerosis; PSP¶, normal at entry but developed progressive supranuclear palsy.

Notes:*One case had additional infarcts; **One case had an additional infarct, one case had AGD, and one case had additional age-related tau astrogliopathy; §One case had additional age-related tau astrogliopathy; †One case had additional AGD and one case had additional TDP-43 proteinopathy; ‡One case had additional TDP-43 proteinopathy. Small vessel disease (arteriolosclerosis and cerebral amyloid angiopathy) was a feature of all cases.

14 additional cases are pending shipment and/or review.

Mean age at death 81.9 y (range=59-97), 79% male

Exp. CDR available for 51 cases: CDR 0=1, CDR 0.5=7, CDR1=5, CDR2=9, CDR3=29

Major Accomplishments/Knowledge Gained during the lifetime of the ADNI NPC

- The Neuropathology Core has successfully developed protocols for the notification and administration of an autopsy and procurement of donated tissue from participating ADNI sites.
- The Neuropathology Core has coordinated with ADNI sites to obtain 71 autopsies; uniform neuropathology is now available on 57 participants. Frozen/fixed brain tissue is available on request.
- Neuropathology has helped to validate clinical and neuropsychological data, MRI, PET, and CSF biomarkers.
- Neuropathology provides a very rich data set for validation of biomarkers in AD clinical trials.
- The presence of significant comorbidity in LOAD indicates that the pathology in this cohort is heterogeneous and likely influences biomarker outcomes and the design of clinical studies.

Neuropathology informs Biomarker and Neuroimaging Data

- Late-onset AD (LOAD, ADNI) has significantly more comorbid neuropathology (TDP-43, HS, AGD, ARTAG) than ADAD (DIAN). (Cairns et al. 2015).
- Comorbid Lewy body disease in AD (n=22) is associated with frontal and parietal lobe hypometabolism (Toledo et al., 2013) Update in review.
- Alpha-synuclein in CSF reduced in AD+DLB v. AD (Toledo et al. 2013) Update in review.
- PD variants weakly associated with LB in AD (Sungeun et al. AAIC 2016).

ADNI Neuropathology Webinar

- Presentation and discussion forum at the San Diego face-to-face investigator meeting October 2016. Weather was great!!
- Webinar held April 11th for all ADNI 3 site personnel.
- 62 attendees (site coordinators, PIs, and neuropathologists)
- Slides are located in the document repository: https://atrihub.box.com/s/1f2u1mswlgenej6djxxojg4bvv4ax8sm , password: adni32016 – Study Docs for Sites > Webinars > Neuropath.