Institute of Mental Health protocol 95-M-96). All subjects with AD also designated a durable power of attorney proxy for research.

After routine medical and physical assessments, LPs were performed in the morning with the patient in a sitting ($n = 82$) or lateral decubitus position ($n = 18$). Following a sterile preparation and local anesthesia with 2% lidocaine, a 4-cm long, 20-gauge, cutting-tip needle was used as an introducer in the L3-4 or L4-5 interspace. Next, a 25-gauge, Whitacre-point spinal needle was inserted through the introducer and placed into the spinal sack. After fluid return, the spinal needle was connected to a 10-mL syringe via a polypropylene line. Negative pressure sufficient to remove CSF at a slow rate of approximately 2 mL/min was applied by gradual withdrawal with a syringe. The subjects were instructed to lie in bed for 15 to 20 minutes after the LP before resuming normal activities.

Postdural puncture headache was defined according to the criteria set forth by the Headache Classification Committee of the International Headache Society.⁶ Cognitively normal participants were followed via phone queries pertaining to post-LPHA symptoms for 1 week; subjects with AD were observed directly while remaining on the inpatient unit.

Results. Four people (4%) experienced mild to moderate post-LPHA symptoms; no symptomatic blood patches were required. Seventeen patients (17%) reported mild headache symptoms during the LP that corresponded with the removal of CSF. All of these patients were in the sitting position during symptom formation, and headache symptoms terminated during the 15-minute rest period in 14 of these patients. The remaining three patients, all of whom reported HA symptoms prior to the LP (two tension and one caffeine withdrawal) reported termination of HA symptoms within 4 hours after the LP. A greater number of HAs were documented in subjects <55 years of age ($\chi^2 = 11.61$, $p < 0.003$). Neither body mass ($\chi^2 = 2.15$, $p = 0.34$) nor sex ($\chi^2 = 44$, $p = 0.11$) was found to be related to HA incidence in this study. No other unexpected side effects were noted during this study. An average of 23.1 mL (± 4.8 mL) of CSF was collected per subject.

Discussion. Our findings of a low incidence of post-LPHA (4%) and a lack of additional adverse events support the safe use of small-diameter spinal needles coupled with negative pressure collection of CSF. This rate is significantly lower than our traditional rate of 25% (Sunderland et al., unpublished data) using the large needle and free drainage, and it is also lower than a previous report using small-diameter needles and negative pressure withdrawal of CSF.² The lower incidence of post-LPHAs may be due to the enrollment of significantly older subjects in our study (mean

age = 59.4 vs 23.2 years), as older subjects tend to have a lower incidence of post-LPHAs than younger, thin women.⁴ The slow rate of fluid collection with negative pressure may have helped protect against more severe side effects. The mild, transient HA experienced by 17% of our participants during the collection of CSF was likely due to the large quantity of CSF collected while in the sitting position, but it did not lead to a classic post-LPHA or additional significant adverse events. Indeed, another report has previously referred to a "drainage headache" produced by free drainage of approximately 20 mL of CSF.⁷ In conclusion, we found the technique of fine-needle, negative pressure LP to be a well-tolerated method for collecting large quantities of CSF. We expect that such a reduction in the risk of post-LPHAs could improve initial enrollment and help retain participants in longitudinal studies requiring repeat LPs.

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References

1. Kuntz KM, Kokmen E, Stevens JC, Miller P, Offord KP, Ho MM. Post-lumbar puncture headaches: experience in 501 consecutive procedures. *Neurology* 1992;42:1884–1887.
2. Tourtellotte WW, Henderson WG, Tucker RP, Gilland O, Walker JE, Kokman E. A randomized, double-blind clinical trial comparing the 22 versus 26 gauge needle in the production of the post-lumbar puncture syndrome in normal individuals. *Headache* 1972;12:73–78.
3. Strupp M, Schueler O, Straube A, Stuckrad-Barre S, Brandt T. "Atraumatic" Sprotte needle reduces the incidence of post-lumbar puncture headaches. *Neurology* 2001;57:2310–2312.
4. Evans RW, Armon D, Frohman EM, et al. Assessment: prevention of post-lumbar puncture headaches. *Neurology* 2000;55:909–914.
5. Dittmann M, Schafer HG, Ulrich J, Bond-Taylor W. Anatomical re-evaluation of lumbar dura mater with regard to postspinal headache. *Anaesthesia* 1998;43:635–637.
6. Headache Classification Committee of the International Headache Society. Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalgia* 1988;8(suppl 7):51–53.
7. Kunkle EC, Ray BS, Wolff HG. Experimental studies on headache: analysis of the headache associated with changes in intracranial pressure. *Arch Neurol Psychiatry* 1943;49:323–358.

Correction

In the letter to the editor, "Reversible ALS-like disorder in HIV infection. An ALS-like syndrome with new HIV infection complete response to antiretroviral therapy" (*Neurology* 2002;59:474–475), an author's name was incorrectly cited. The author's name should read HJ von Giesen, MD. The publisher apologizes for this error.

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