

Research News

Creation of the Argentina-Alzheimer's Disease Neuroimaging Initiative

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Argentina-Alzheimer's Disease Neuroimaging Initiative¹

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Abstract

The Alzheimer's Disease Neuroimaging Initiative (ADNI) is a multisite, longitudinal study that assesses clinical, imaging, genetic, and biospecimen biomarkers through the process of normal aging to mild cognitive impairment and dementia. We present the creation of the Argentina-ADNI—the first South American ADNI—and its effort to acquire data comparable with those gathered in other worldwide ADNI centers.

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Alzheimer's disease; Amyloid imaging; Mild cognitive impairment; Biomarkers; ADNI

1. Introduction

In late 2011, the Argentina-Alzheimer's Disease Neuroimaging Initiative (ADNI) was established. The Argentina-ADNI is the first worldwide ADNI center in Latin America [1]. The Institute for Neurological Research, “Fundación para la Lucha contra las Enfermedades Neurológicas de la Infancia (FLENI; [Foundation for the Fight against Neurological Diseases in Childhood], <http://www.fleni.org.ar/>), in Buenos Aires, is home for the Argentina-ADNI. The ADNI protocol received institutional review board approval at FLENI on February 10, 2011. The Argentina-ADNI became official on October 25, 2011.

2. Structure and design of the study

The methodological organization of the Argentina-ADNI is comparable with other worldwide ADNI programs [2]. The Argentina-ADNI team has been enrolling volunteers,

age 55–90 years, for this study since January 2012. Argentina-ADNI participants are monitored for 36 months using the ADNI 2 protocol [3]. Recently (June 2013), we finish recruiting 60 Argentine participants as part of pilot phase, 15 of whom have a current diagnosis of mild Alzheimer's disease (AD) dementia, 30 of whom have mild cognitive impairment (MCI), and 15 control subjects.

All participants are evaluated in a uniform manner at entry and longitudinally thereafter with instruments that include a clinical and neuropsychological test battery, biological fluids collection, and structural, functional, and amyloid neuroimaging.

However, distinct differences to the ADNI are that the neuropsychological test battery includes validated indicators and scales of cognitive reserve for MCI participants; tensor diffusion images and cortical evoked potentials, which are acquired every 12 months; and a determination of the presence of neuroinflammation as a substantial contributor to AD and the role of neurodegeneration (measured by cerebrospinal fluid [CSF] tau) as a cause or consequence of typical amyloid cascade.

All participants have clinical/cognitive assessments and undergo 3.0-T structural magnetic resonance imaging (MRI) and positron emission tomography (PET) at specified intervals. Participants are assessed at 0, 6, 12, and 24 months for 2 years. CSF collection occurs at 0 and 12 months [3,4].

The authors have no conflicts of interest to report.

Members of the Argentina-Alzheimer's Disease Neuroimaging Initiative include Patricio Chrem Méndez, Jorge Campos, María Eugenia Martín, Horacio Martinetto, Fernando Ventrice, Alejandra Amengual, Marcos Fernández Suarez, Griselda Russo, Gabriela Cohen, María Florencia Clares, Paula Harris, and Miguel Riudavets.

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3. Principal investigators team

The Argentina-ADNI is overseen by a management committee. The structural organization of the Argentina-ADNI is comprised of four streams of research (Fig. 1), each of which are directed by a stream leadership group.

4. The Argentina-ADNI clinical stream

The clinical stream is the most important in the flow diagram (Fig. 1). Patients present with self- and/or caregiver-reported memory/behavioral problems, some of whom have mild AD.

To increase recruitment, several activities were carried out to foster awareness of prodromal AD, such as talks in scientific forums, consulting for memory concerns, videotaped interviews, and the use of press ads. Although these activities do not make explicit reference to the study, they have been useful in bringing potential patients to the sites.

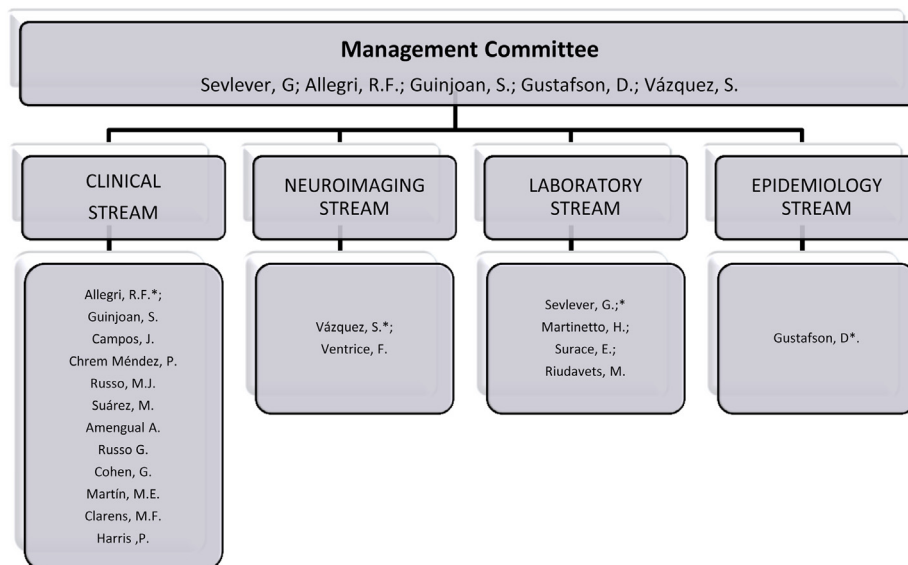
In August 2011, we administered a simplified international survey (adapted from the original) to evaluate the perception and the level of public knowledge of AD, and to ascertain their point of view regarding the value of making an early diagnosis of the disease [5,6]. Results from the survey show that AD was the third biggest health fear after cancer and stroke. More than 90% of the people wanted to know the true diagnosis if they have the disease, and 80% of the people agreed to undergo an ancillary study to confirm the diagnosis. This is a big change in the attitude of Latin American people. This survey was very important in the ethical context linked to the advent of new

biomarkers and the possibility of an early diagnosis. We need to consider the proactive opinion of patients in relation to the clinical use of these biomarkers.

The screening visit is the first step in the clinical protocol. Screening consists of explaining the study, acquiring informed consent and demographic information, determining inclusion/exclusion, acquiring a medical history, conducting a physical examination and a neurological examination, administering screening neurocognitive tests, acquiring vital signs, conducting blood sampling for screening laboratory results and apolipoprotein E genotyping, determining current medications and any adverse events, and acquiring a magnetic resonance image. If patients are eligible based on these assessments, they are asked to participate in a baseline interview, which includes more extensive neurocognitive assessments. All are available in Spanish and are used at FLENI (Table 1 [7–21]). Participants complete the baseline visit by undergoing a lumbar puncture and PET.

5. The Argentina-ADNI neuroimaging stream

The MRI protocol is as described in the *ADNI 3T MRI Technical Procedures Manual* [22]. The FLENI machine is a 3.0-T MRI machine with an eight-channel head coil, and it is located on the FLENI Belgrano campus. A magnetization-prepared 180 degrees radio-frequency pulses and rapid gradient-echo (MP RAGE) and inversion prepared spoiled gradient-recalled-echo (IRSPGR) images is used to measure rate of change and predict future change in MCI and in control subjects. All scans are uploaded to the Laboratory of



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Fig. 1. Structural organization of Argentina-Alzheimer's Disease Neuroimaging Initiative ADNI. *Stream Chair.

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