

# Benefits of cognitive-motor intervention in MCI and mild to moderate Alzheimer disease

J. Olazarán, MD, PhD;\* R. Muñiz, BSc;\* B. Reisberg, MD; J. Peña-Casanova, MD, PhD; T. del Ser, MD, PhD; A.J. Cruz-Jentoft, MD; P. Serrano, MD; E. Navarro, MD; M.L. García de la Rocha, MD; A. Frank, MD, PhD; M. Galiano, MD; Y. Fernández-Bullido, MD; J.A. Serra, MD, PhD; M.T. González-Salvador, MD; and C. Sevilla, MD

**Abstract—Objective:** To evaluate the efficacy of a cognitive-motor program in patients with early Alzheimer disease (AD) who are treated with a cholinesterase inhibitor (ChEI). **Methods:** Patients with mild cognitive impairment (MCI) (12), mild AD (48), and moderate AD (24) (Global Deterioration Scale stages 3, 4, and 5) were randomized to receive psychosocial support plus cognitive-motor intervention (experimental group) or psychosocial support alone (control group). Cognitive-motor intervention (CMI) consisted of a 1-year structured program of 103 sessions of cognitive exercises, plus social and psychomotor activities. The primary efficacy measure was the cognitive subscale of the AD Assessment Scale (ADAS-cog). Secondary efficacy measures were the Mini-Mental State Examination, the Functional Activities Questionnaire, and the Geriatric Depression Scale. Evaluations were conducted at 1, 3, 6, and 12 months by blinded evaluators. **Results:** Patients in the CMI group maintained cognitive status at month 6, whereas patients in the control group had significantly declined at that time. Cognitive response was higher in the patients with fewer years of formal education. In addition, more patients in the experimental group maintained or improved their affective status at month 12 (experimental group, 75%; control group, 47%;  $p = 0.017$ ). **Conclusions:** A long-term CMI in ChEI-treated early Alzheimer disease patients produced additional mood and cognitive benefits.

NEUROLOGY 2004;63:2348–2353

Recent evidence suggests that cognitive activity may delay the clinical onset of Alzheimer disease (AD).<sup>1</sup> Most stimulation programs for early AD patients target cognition because some neuronal plasticity and compensation capacity are believed to persist.<sup>2,3</sup> Some positive results have been observed in the stimulated areas, but the specificity of effects, the impact in non-stimulated domains, and long-term maintenance of benefits remain controversial. Most studies with an adequate control group only evaluate the stimulated functions, and there are few long-term reports.<sup>4-9</sup>

Cholinesterase inhibitors (ChEI) are of benefit in AD.<sup>10,11</sup> A combination of both pharmacologic and cognitive therapy improves cognition in elders with memory complaints or dementia.<sup>12,13</sup> We performed a

multicenter, randomized, single-blind, controlled, parallel-group trial of a non-pharmacologic intervention in ChEI-treated AD patients to investigate the long-term benefits of cognitive therapy on cognition, function, and mood.

**Methods. Patients.** Patients were recruited from January 1999 to June 2001 from 12 neurologic, geriatric, or psychiatric clinics and 5 behavioral neurology units of the central and eastern metropolitan area of Madrid. Only community dwelling patients were included and they had to fulfill the following criteria: a clinical diagnosis of either mild cognitive impairment (MCI)<sup>14</sup> or probable AD,<sup>15</sup> a stage 3, 4, or 5 in the Global Deterioration Scale,<sup>16</sup> current use of a daily dose of 5 to 10 mg of donepezil or 6 to 12 mg of rivastigmine for more than 1 month, and patient's and caregiver's willingness and capability to receive a cognitive intervention. Exclusion criteria were illiteracy and any physical condition that could preclude regular attendance and full participation in the intervention program (e.g., a non-controlled systemic illness, relevant hearing and vision deficits, severe physical disability). Routine laboratory analyses and neuroimaging studies (CT or MRI) had been previously performed, and were consistent with an AD or MCI diagnosis. The intake of sedative and antidepressant med-

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\*These authors contributed equally to this work as first authors.

From Fundación María Wolff (Drs. Olazarán and Serrano, and R. Muñiz), Madrid; Consulta de Neurología (Dr. Olazarán), CEP Hermanos Sangro, Madrid; Servicio de Neurología (Drs. Olazarán, Navarro, Galiano, and Fernández-Bullido) and Geriatria (Dr. Serra), Hospital Gregorio Marañón, Madrid, Spain; Silberstein Aging and Dementia Research Center (Dr. Reisberg), NYU School of Medicine Medical Center, New York, NY; Servicio de Neurología (Dr. Peña-Casanova), Hospital del Mar, Barcelona; Servicio de Neurología (Dr. del Ser), Hospital Severo Ochoa, Leganés; Unidad de Geriatria (Dr. Cruz-Jentoft), Hospital Ramón y Cajal, Madrid; Consulta de Neurología (Dr. Navarro), CEP Vicente Soldevilla, Madrid; Servicio de Neurología (Dr. García de la Rocha) and Psiquiatría (Dr. González-Salvador), Hospital Gómez Ulla, Madrid; Servicio de Neurología (Dr. Frank), Hospital la Paz, Madrid; Consulta de Neurología (Dr. Galiano and Fernández-Bullido), CEP Moratalaz, Madrid; and Servicio de Neurología (Dr. Sevilla), Hospital de la Princesa, Madrid, Spain.

Supported by IMSERSO from the Ministerio de Asuntos Sociales and the Fundació "la Caixa."

Received November 10, 2003. Accepted in final form August 31, 2004.

Address correspondence and reprint requests to Dr. Rubén Muñiz, Director de Investigación, Fundación María Wolff, Cardenal Silíceo 14, 28002 Madrid, Spain; e-mail: [ruben@mariawolff.es](mailto:ruben@mariawolff.es)

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