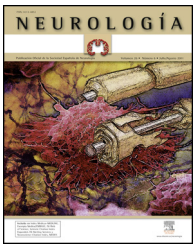
Neurología. 2014;29(4):224—229

NEUROLOGÍA

www.elsevier.es/neurologia



ORIGINAL ARTICLE

Cognitive impairment and antiretroviral treatment in a Peruvian population of patients with human immunodeficiency virus☆

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Received 25 January 2013; accepted 2 June 2013
Available online 24 April 2014

KEYWORDS
Cognitive impairment;
Cognitive profile;
Highly active antiretroviral therapy;
Neuropsychological test;
Human immunodeficiency virus

Abstract
Background: HIV-associated cognitive impairment occurs even in the early stages of infection. Short-term memory, psychomotor speed, attention, and executive functioning are the main capacities affected. Controversy exists regarding whether highly active antiretroviral therapy (HAART) is helpful in combating this process. The objective of the present study is to determine the association between cognitive impairment and HAART in HIV-infected patients from Hospital Regional de Huacho.
Methods: Prospective study of HIV patients meeting criteria to start HAART. Twenty-one HIV-positive patients were recruited between April and July 2011. Researchers administered a standardised neuropsychological test battery before and 4 weeks after onset of HAART. Psychomotor speed, executive function, short term memory (visual and verbal), attention, and visuospatial performance were evaluated.
Results: Nineteen patients completed the study (14 males and 5 females). In the pre-HAART evaluation, most patients scored below average on the executive function and psychomotor speed subtests. Psychomotor speed and immediate visual memory improved significantly after four months of treatment with HAART.
Conclusions: Some degree of cognitive decline may present even in the early and asymptomatic stages of HIV infection. The benefits of antiretroviral treatment for cognitive performance can be detected after only a few weeks of follow-up.

PALABRAS CLAVE
Deterioro cognitivo;
Perfil cognitivo;

Deterioro cognitivo y tratamiento antirretroviral en pacientes con virus de la inmunodeficiencia humana en una población peruana

Resumen
Introducción: La presencia de deterioro cognitivo asociado al virus de la inmunodeficiencia humana (VIH) se presenta desde estadios tempranos de la infección. Las principales funciones

☆ Please cite this article as: Guevara-Silva EA. Deterioro cognitivo y tratamiento antirretroviral en pacientes con virus de la inmunodeficiencia humana en una población peruana. Neurología. 2014;29:224—229.

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2173-5808/$ - see front matter

Terapia antirretroviral de gran actividad; Test neuropsicológico; Virus de la inmunodeficiencia humana

comprometidas son la memoria a corto plazo, la velocidad psicomotriz, la atención y la función ejecutiva. Existe controversia sobre la disminución de esta complicación con la terapia antirretroviral de gran actividad (TARGA). El presente trabajo tiene como objetivo determinar la asociación entre la alteración cognitiva y la terapia antirretroviral en pacientes con VIH del Hospital Regional de Huacho.

Métodos: Estudio prospectivo de pacientes con VIH y con criterios para ingresar a TARGA. A 21 pacientes VIH +, enrolados desde abril hasta julio del 2011, se les administró una batería neuropsicológica estandarizada antes y 4 meses después del inicio de la TARGA. Las funciones cognitivas evaluadas fueron la velocidad psicomotriz, la función ejecutiva, la memoria a corto plazo (visual y verbal), la atención y las habilidades visuoespaciales.

Resultados: Diecinueve pacientes terminaron el estudio (14 varones y 5 mujeres). En la evaluación pre-TARGA se encontró que la mayoría de los pacientes obtenían puntuaciones menores a los promedios en las pruebas de función ejecutiva y velocidad psicomotriz. Luego de 4 meses de iniciar TARGA, la velocidad psicomotriz y la memoria inmediata visual mejoraron significativamente.

Conclusiones: El compromiso cognitivo en algún grado puede presentarse desde las fases tempranas y asintomáticas de la infección por el VIH. El beneficio del tratamiento antirretroviral sobre el rendimiento cognitivo se puede observar aun con pocas semanas de seguimiento.

Introduction

Cognitive impairment is a well-documented neurological complication among patients with acquired immune deficiency syndrome (AIDS). It may evolve into a subcortical type of dementia that is caused by multiple factors.[1–4] This complication may also present in early stages of infection with human immunodeficiency virus (HIV).[5,6] The main features of cognitive disorders are loss of memory, attention, and executive function, with psychomotor retardation and impairment of visuospatial abilities.[4,7] A wide array of instruments are available for measuring these changes: the Trail Making Test, digit span, Rey Auditory Verbal Learning Test, category and letter verbal fluency tests, and others. They are indicated by the World Health Organization (WHO) for different geographical areas and sociocultural settings.[8]

Highly active antiretroviral therapy (HAART) increases cognitive function because of its ability to reach high concentrations in nervous tissue and its effectiveness against the HIV infection within lymphocytes, macrophages, and microglia.[4,9–12] Nevertheless, some articles show that despite HAART treatment, cognitive impairment increases as patients age.[13] This is due to other factors, such as low drug penetrance, sustained inflammation, amyloid deposition, and presence of comorbidities.[14] However, other articles mention that cognitive function may improve when patients discontinue treatment.[15]

The wide variety of seemingly contradictory results in international publications and the lack of data in our setting led us to undertake this study. Its aim is to determine the association between antiretroviral therapy and cognitive function in HIV-positive patients in a Peruvian population.

Patients and methods

Study design

Analytic, prospective study.

Subjects

We recruited 21 HIV-positive patients aged 18 years and older who were treated at the infectious disease department at Hospital Regional de Huacho, Lima, between April and July 2011. Patients were selected according to the following inclusion criteria: first-time treatment with HAART, at least 4 years of schooling, no history of opportunistic infections of the nervous system, no consumption of drugs or alcohol in the past 6 months, and no other causes of cognitive impairment or alteration of consciousness. We excluded patients for whom viral load data or CD4 count was not available before HAART was started. Effectiveness of HAART was measured based on viral load and CD4 count values. Two patients discontinued treatment during the study, so the study analysis only examines data from 19 patients.

Neuropsychological tests

All subjects were assessed with a thorough clinical neurological examination performed by the researcher, after which they underwent a neuropsychological evaluation conducted by a psychologist with experience in evaluating HIV-positive patients. The evaluation consisted of the tests listed here. The Trail Making Test parts A and B is a test in which the subject connects letters and numbers printed on a worksheet in the shortest possible time. Times ranged from 22 to 57 seconds for part A, and from 48 to 145 seconds for part B, depending on age and years of schooling. The digit/symbol coding test, used to evaluate immediate visual memory, involves filling in the maximum number of boxes on a printed sheet within 120 seconds. Each completed box will contain a number from 1 to 9 and correct answers are scored with 1 point, with 133 being the highest possible score. The Rey Auditory Verbal Learning Test evaluates deferred verbal memory. Here, subjects recall a list of 15 words after an interval of several minutes; the maximum score is 15. The digit-span task was used to measure attention based on the patient's ability to retain a