Available online at www.sciencedirect.com

SciVerse ScienceDirect

Comprehensive Psychiatry 54 (2013) 649–657

COMPREHENSIVE PSYCHIATRY

www.elsevier.com/locate/comppsych

The neuropsychological and neurophysiological profile of women with pseudoseizure

Behice Han Almis[a], Birgul Elbozan Cumurcu[b,*], Suheyla Unal[b], A. Cemal Ozcan[c], Ozgur Aytas[d]

[a]*Adiyaman University Training and Research Hospital, Adiyaman, Turkey*
[b]*Department of Psychiatry, Inonu University Faculty of Medicine, Malatya, Turkey*
[c]*Department of Neurology, Inonu University Faculty of Medicine, Malatya, Turkey*
[d]*Malatya State Hospital, Malatya, Turkey*

Abstract

Objective: Our aim in this study was to compare the assessments of neuropsychological tests and the p50 neurophysiological test of patients with seizure diagnosed as conversion disorder and healthy control subjects, and to investigate the neurological status in conversion disorder with pseudoseizure.

Methods: A total of 22 female conversion disorder patients with convulsions diagnosed according to SCID-I/CV and 22 healthy women were included in the assessment. The participants were administered WMS-R, the cancellation test, and the Stroop test as neuropsychological tests and p50 was assessed as a neurophysiological test.

Results: The patient's results for the neuropsychological tests were found to be significantly low compared to the control group. The p50 sensory gating ratios of the patient group were statistically significantly lower than the controls. There was no significant correlation between the neuropsychological test scores and gating ratios of the patient and control groups.

Conclusions: This study is the first to check sensory gating in conversion disorder patients with pseudoseizure and its most important result is finding reduced p50 sensory gating in patients. Our results suggest that these patients have a neurological tendency to this disease due to functional neurophysiological features.

1. Introduction

Pseudoseizures are a subtype of conversion disorder (CD) that closely resembles epileptic seizures but is not accompanied by tongue biting, urinary incontinence, severe injury or unconsciousness [1]. Many psychodynamic views, neurobiological and genetic factors and sociocultural approaches have been used to explain the etiology of CD but it is generally thought to be a multi-factorial disorder [2]. Breuer and Freud defined pseudoneurological signs as the bodily representations of unconscious mental conflicts [3].

Although there are only a few studies on the role of biological factors in CD, some recent publications report a possible pathology in the cerebral functions of these patients [4–7]. These studies have mostly been carried out in the subtype of CD with motor signs and are associated with hemispheric dominance, event-related evoked potentials, structural and functional brain imaging and neuropsychological tests (NPT). A study by Yazıcı and Kostakoğlu [8] has reported decreased cerebral blood flow in the left parietal region in 1 patient and left temporal region in 4 patients with difficulty walking while Spence et al. [9] have reported decreased left dorsolateral frontal cortex efficiency in CD patients with signs of left hemiparesis. Another study in CD patients with sensory and motor loss has reported decreased regional cerebral blood flow in the thalamus, putamen and caudate nucleus contralateral to the involved part, and improved cerebral blood flow together with an improvement in the signs [10]. Labate et al. have postulated that the

* Corresponding author. Department of Psychiatry, İnonu University School of Medicine, Malatya, Turkey. Tel.: +90 422 3410660/5407; fax: +90 04223410036.
E-mail address: birgulelbozan19@hotmail.com (B.E. Cumurcu).

0010-440X/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.comppsych.2012.12.027

cerebellum, in addition to motor and premotor areas of the right hemisphere, also plays an important role in psychogenic seizures [11].

The CD model suggested by Ludwig indicates that the symptoms are related to an attention disorder due to increased corticofugal inhibition of afferent stimuli [12]. Study results till now have shown results parallel to this view. Neurophysiological studies have also emphasized the importance of the higher level cortical mechanisms in CD and revealed that frontal cortical and limbic activation related to emotional stress has an inhibitory effect on the basal ganglia–thalamocortical pathways and thus prevents the conscious sensory and motor process [4].

Studies using NPT that provide data on the location and type of disturbances reflected in the behavior in the cerebral field undertaken by scanning the cerebral fields that could possibly have structural damage [13] have supported the view that the main problem in CD is in the fields of memory, scanning stimuli and information processing and that these originate from corticofugal inhibition of afferent stimuli [4].

Some assumptions regarding information processing, which can be summarized as the perception and evaluation of the stimulus and giving the appropriate response, contribute to our view that CD is a problem with information processing. Sensory stimuli are processed in the brain via two-way processes from below to above vice versa. The lower level systems classify and define the stimuli received and transfer them to the upper level processing centers (bottom-up processing), while the prefrontal mechanisms try to control the incoming stimulus with activities such as getting ready for the received stimulus, prediction, attention and planning (top-down processing) [14,15].

Sensory gating plays quite an important role in this two-way process. Sensory gating is the first step in the pre-attention stage of information processing and enables the passage of only parts of the stimuli in the brain while filtering the unrelated stimuli [16]. P50 is thought to reflect the sensory gating mechanism and prevent excessive information loading. The deficit in p50 suppression reflects an impairment of the central inhibitory circuits that modulate cortical responses to sensory inputs [17]. Some studies show an important role of the prefrontal cortex on P50 suppression [18].

We tried to understand how the information processing worked in patients with pseudoseizures using sensory gating and NPT. We used the neuropsychological test Wechsler Memory Scale-Revised (WMS-R) to evaluate attention and memory and the Stroop Test (ST) and Cancellation Test (CT) to evaluate the attention. We wanted to test our assumption that the controlling and suppressive mechanism from above to below would be more effective in attention and sensory processes than mechanisms from below to above. We therefore planned to compare the NPT and p50 results of pseudoseizure patients with a healthy control group. Our aim was to contribute to the elucidation of CD neurobiology, obtain data that might hold clues for the cerebral region responsible for the development of the disorder, and measure how the above tests could be used for the diagnosis.

2. Methods

2.1. Subjects

A total of 24 patients who had presented at the Psychiatry Outpatients Department, had been diagnosed with CD with pseudoseizures according to the Structured Clinical Interview for DSM-IV-Clinical Version (SCID-I/CV) [19] and provided informed consent to participate in the study were included in our study. This study was approved by the local ethic committee. The patient group consisted of 22 females and 2 males but we did not include the data of the 2 male patients to prevent any complicating factors. The control group consisted of 22 healthy female volunteers who were matched with the patient group for age, gender and education. The inclusion criteria for the study for both the patient and the control groups were using the right hand, presenting for treatment for the first time, not having taken a psychotropic drug in the last two weeks, not having a history of any neurological or neurosurgical disorder, no childhood history of a sequel-causing disease and/or head trauma, no mental retardation or additional medical problem, no alcohol-substance abuse or usage disorder in the last year and no other psychiatric and/or personality disorder diagnosis according to the DSM-IV-TR [1].

2.2. Procedure

After administration of SCID-I/CV by an experienced investigator to the patients and healthy controls, the socio-demographic data form, Hamilton Depression Rating Scale (HDRS) [20], Hamilton Anxiety Rating Scale (HARS) [21] and the neuropsychological tests of WMS-R, CT, and ST were administered. Following the consecutive administration of all neuropsychological tests, the p50 test was administered at the neurology laboratory on the same day.

2.3. Neuropsychological tests

2.3.1. Wechsler Memory Scale-Revised (WMS-R)

WMS-R, developed by Wechsler [22], is a psychometrically advanced measurement tool that evaluates memory in a comprehensive manner. The study form consists of personal and actual information, orientation, mental control, logical memory, forward number range, reverse number range, and visual recall subtests. The Turkish standardization studies of the WMS-R have been conducted [23].

2.3.2. Stroop Test (ST)

The ST was originally developed by Stroop as an experimental task in 1935 [24]. The ‘Stroop effect’ is based on reading the names of colors printed differently from the color that they denote. There are various individually administered forms of ST. Turkish standardization studies of the Stroop Test have been conducted [23].