Schizophrenia Research xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

Motor abnormalities and cognitive impairment in first-episode psychosis patients, their unaffected siblings and healthy controls

Manuel J. Cuesta [a,b,*], Lucia Moreno-Izco [a,b], María Ribeiro [a,b], Jose M. López-Ilundain [a,b], Pablo Lecumberri [b,c], Teresa Cabada [b,d], Ruth Lorente-Omeñaca [a,b], Ana M. Sánchez-Torres [a,b], M. Sol Gómez [b,c], Victor Peralta [b,e]

[a] Department of Psychiatry, Complejo Hospitalario de Navarra, Pamplona, Spain
[b] IdiSNA, Navarra Institute for Health Research, Pamplona, Spain
[c] Department of Mathematics, Universidad Pública de Navarra, Pamplona, Spain
[d] Department of Neuroradiology, Complejo Hospitalario de Navarra, Pamplona, Spain
[e] Mental Health Department, Servicio Navarro de Salud, Spain

ARTICLE INFO

Article history:
Received 8 July 2017
Received in revised form 20 October 2017
Accepted 23 October 2017
Available online xxxx

Keywords:
Schizophrenia
First-episode psychosis
Unaffected siblings
First-degree relatives
Healthy controls
Neurological assessment
Catatonia
Extrapyramidal signs
Akathisia
Parkinsonism
Abnormal movements
Neurological soft signs
Cognitive functioning
Cognitive impairment
MATRICS

ABSTRACT

Motor abnormalities (MAs) may be already evidenced long before the beginning of illness and are highly prevalent in psychosis. However, the extent to which the whole range of MAs are related to cognitive impairment in psychosis remains understudied.

This study aimed to examine comparatively the relationships between the whole range of motor abnormalities and cognitive impairments in the first-episode of psychosis (FEP), their unaffected siblings and healthy control subjects.

Fifty FEP patients, 21 of their healthy siblings and 24 age- and sex matched healthy controls were included. Motor assessment included catatonic, extrapyramidal and neurological soft signs (NSS) by means of standardized instruments. An exhaustive neuropsychological battery was also performed to extract the 7 cognitive dimensions of MATRICS initiative.

Higher scores on NSS but not on extrapyramidal and catatonic signs showed significant associations with worse cognitive performance in the three study groups. However, the pattern of associations regarding specific cognitive functions was different among the three groups. Moreover, extrapyramidal signs showed significant associations with cognitive impairment only in FEP patients but not in their unaffected siblings and healthy controls. Catatonic signs did not show any significant association with cognitive functioning in the three study groups.

These findings add evidence to the associations between motor abnormalities, particularly NSS and extrapyramidal signs, and cognitive impairment in first-episode psychosis patients. In addition, our results suggest that the specific pattern of associations between MAs and cognitive functioning is different in FEP patients from those of the unaffected siblings and healthy subjects.

1. Introduction

Classic European psychiatric schools conferred different relevance to motor abnormalities (MAs) in nosological systems. The psychiatric tradition rooted in the writings of Kraepelin, Bleuler and Schneider did not consider motor abnormalities as core symptoms of psychosis (Jablensky, 2010). On the contrary, the tradition from the Wernicke, Kleist and Leonhard (WKL) school departed substantially from the referenced authors by giving prominence to MAs over other typical psychopathological symptoms of psychosis, such as delusions and hallucinations (Cuesta et al., 2015). Thus, WKL school emphasized clinical signs over symptoms in psychopathological assessment and define psychiatric entities based on signs, course and outcome, and family history (Peralta and Cuesta, 2017).

DSM-5 introduced catatonia as specifier for schizophrenia and other psychotic disorders, mood disorders and neurological and medical conditions causing mental disorders (APA, 2013). However, other MAs continue to be neglected in current classifications.

The motor domain comprises a wide number of abnormalities that are not restricted to catatonic phenomena but involves as well extrapyramidal signs, such as parkinsonism, akathisia and dystonia; abnormal movements, such as dyskinesia and coreic movements; and neurological soft signs (NSS) (Peralta and Cuesta, 2017; Walther and Strik, 2012). Moreover, certain MAs may be already evidenced long before the beginning of illness (Walker et al., 1994) and they are highly prevalent across psychotic disorders and other psychiatric and neurologic disorders (Peralta and Cuesta, 2017).

* Corresponding author at: Department of Psychiatry, Complejo Hospitalario de Navarra, c/ Irunlarrea, 4.31008 Pamplona, Navarra, Spain.

https://doi.org/10.1016/j.schres.2017.10.035
0920-9964/

The vast majority of studies on MAs included one (usually focused on NSS) or two MAs domains, such as NSS and extrapyramidal signs (Whitty et al., 2009) or NSS and catatonic signs (Morrens et al., 2014) but very few comprising the whole range of MAs (Peralta et al., 2011; Peralta et al., 2014). In addition, there is comparatively much less research focused on the relationships between MAs and cognitive impairment in psychosis. The majority of these studies have been focused on NSS (Cuesta et al., 2002; Chan et al., 2010; Mellacqua et al., 2012). Few of them were focused on extrapyramidal signs (Cuesta et al., 2015; Fervaha et al., 2015); very few included catatonic signs (Docx et al., 2012); and none comprised the whole range of MAs and included first-episode psychosis patients and their first-degree relatives.

The present study has two aims. First, to examine comparatively the relationships between the whole range of motor abnormalities and cognitive impairments in the first-episode of psychosis (FEP). And second, to examine whether these associations are similar in FEP patients, their unaffected siblings and healthy control subjects.

2. Methods

2.1. Subjects

50 patients admitted in our psychiatric unit hospital with a first-episode of psychosis, 21 of their healthy siblings and 24 age and sex matched healthy controls regarding patients gave written informed consent to participate in the study. FEP patients were included if they were between 17 and 45 years old and had no antecedents of lifetime substance abuse, neurologic or general medical illness or mental retardation DSM-5 diagnoses (APA, 2013). Siblings were invited to participate in the study. Siblings and controls were assessed by a trained psychologist for affective and psychotic disorders using the abbreviated version of the Comprehensive Assessment Symptoms and History (CASH) (Andreasen et al., 1992). The exclusion criteria for siblings were: current or past history of mental retardation of psychiatric, neurologic or general medical illness, including substance abuse. And an additional exclusion criterion (lack of first-degree relatives with psychosis) was applied only for control subjects.

Healthy controls were mainly recruited by public advertising and by word of mouth among staff of our hospital. This study was approved by the Ethics Committee of the Health Navarre System.

2.2. Diagnosis and psychopathological assessments

The CASH (Andreasen et al., 1992) was used to evaluate patients and in its abbreviated form to discard any personal or familial psychiatric antecedent in healthy controls. Despite patients were initially referred with a diagnosis of 'acute psychotic episode', a final DSM-5 diagnosis was established by consensus using all available information 6 months after inclusion in the study by the two senior psychiatrists (MJC and VP). Positive, negative, disorganization, mania and depression scores were obtained from the CASH interview.

The antipsychotic doses at the time of the psychopathological assessment and the total exposure to antipsychotics during the episode were converted to chlorpromazine equivalents (Ho et al., 2011).

2.2.1. Motor assessments

Scales for motor evaluation include the assessment of neurological soft signs (NSS) by means of the Neurological Evaluation Scale (NES) (Buchanan and Heinrichs, 1989). The NES scale provides a total score and 4 neurological subscales scores, namely: sensory integration, motor coordination, sequencing of complex motor acts, and 'other' soft signs ('other SS'). Extrapyramidal signs were evaluated by means of the Simpson-Angus Scale (SAS) (Simpson and Angus, 1970), and the Barnes Akathisia Rating Scale (BARS) (Barnes, 1989). And catatonic signs by means of the Bush-Francis Catatonia Rating Scale (BFCRS) (Bush et al., 1996).

Motor assessments were carried out by three psychiatrists (LMI, JLI and MR), who were specifically trained and achieved good interrater reliability scores before entering in the study.

2.2.2. Cognitive assessments

Patients were evaluated through exhaustive neuropsychological battery in two or three sessions following the same order of presentation of tests. Neuropsychological assessments were carried by two neuropsychologists (AST and RLO). Both neuropsychologists achieved good interrater reliability and were blind to psychopathological examinations of patients.

Neuropsychological tests with robust psychometric properties and adapted to Spanish were clustered to account for by the 7 cognitive functions of MATRICS (Measurement and Treatment Research to Improve Cognition in Schizophrenia) Consensus Cognitive Battery (MCCB) (Nuechterlein et al., 2004; Nuechterlein et al., 2008). Speed of processing was assessed by means of symbol search and symbol coding subtests of the Wechsler Adult Intelligence Scale 3rd edition (WAIS-III) (Wechsler, 1999), and form A of the Trail Making Test (TMT-A) (Reitan and Wolfson, 1993). Attention was assessed by means of the Continuous Performance Test – Identical Pairs (CPT-IP Performance Test) (Cornblatt et al., 1988) included in MCCB battery (Nuechterlein and Green, 2006), the digit span forward subtest of the WAIS-III (Wechsler, 1999) and the spatial span forward subtest of the Wechsler Memory Scale 3rd edition (WMS-III) (Wechsler, 1998). A Spanish adapted test for assessing verbal learning similar to the California learning list test was used (Test Aprendizaje Verbal, España-Complutense. TAVEC) (Benedet and Alejandre, 1998). Visual memory was assessed by means of the Brief Visuospatial Memory Test Revised (BVMT-R) (Benedict, 1997) from the MATRICS battery (Nuechterlein and Green, 2006). Working Memory was assessed by means of the backwards digit span and letter-number sequencing subtests of the WAIS-III (Wechsler, 1999), and the backwards spatial span subtest of the WMS-III (Wechsler, 1998). Executive function was assessed by means of the computerized version of the Wisconsin Card Sorting Test (WCST-64™ PAR Inc.) (Heaton et al., 1993) and form B of the Trail Making Test (TMT—B) (Reitan and Wolfson, 1993). Finally, social cognition was assessed by means of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) included in the MCCB (Nuechterlein and Green, 2006). Premorbid intelligence was estimated by means of the Vocabulary test of the WAIS-III (Wechsler, 1999). A composite measure of global cognition score was obtained by averaging the 7 cognitive functions.

2.3. Statistical analyses

Total scores of the motor scales were used and additionally NES subscale scores were as well used. SAS and BFCRS scale were factorized with oblique rotation to extract main components resulting in two SAS factors (Hypokinesia and Rigidity) and three BFCRS factors (Impulsivity, Oppositionism and Inhibition). Scores resulting from these factor analyses were also used in further analyses.

Cognitive tests were grouped according with their main cognitive processes in seven cognitive functions. All neuropsychological variables were converted to z-scores, based on the means and standard deviations of the control group. *Z*-scores were averaged to calculate each of the cognitive functions and a global cognitive score. Internal consistency of these functions was estimated by means of Cronbach alpha. All cognitive scores were calculated such that higher values indicated better performance. Performances on motor scores and cognitive functions were compared by one-way ANOVA (Scheffé post-hoc test).

To explore the relationships between motor domains and cognitive functioning, Pearson coefficient correlation analyses were carried out in the three groups of the study. Furthermore, to examine the value of motor domains in the prediction of cognitive functioning, individual motor domains entered as dependent variables and cognitive functions as independent variables in multiple regression models using stepwise

Please cite this article as: Cuesta, M.J., et al., Motor abnormalities and cognitive impairment in first-episode psychosis patients, their unaffected siblings and healthy controls, Schizophr. Res. (2017), https://doi.org/10.1016/j.schres.2017.10.035