Progress in Neuro-Psychopharmacology & Biological Psychiatry 35 (2011) 395–409

Contents lists available at ScienceDirect

Progress in Neuro-Psychopharmacology & Biological Psychiatry

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

Review article

Psychomotor retardation in depression: Biological underpinnings, measurement, and treatment

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ARTICLE INFO

Article history:
Received 29 July 2010
Received in revised form 5 October 2010
Accepted 25 October 2010
Available online 31 October 2010

Keywords:
Major depressive disorder
Neuropsychological measures
Psychomotor retardation
Rating scales

ABSTRACT

Psychomotor retardation is a long established component of depression that can have significant clinical and therapeutic implications for treatment. Due to its negative impact on overall function in depressed patients, we review its biological correlates, optimal methods of measurement, and relevance in the context of therapeutic interventions. The aim of the paper is to provide a synthesis of the literature on psychomotor retardation in depression with the goal of enhanced awareness for clinicians and researchers. Increased knowledge and understanding of psychomotor retardation in major depressive disorder may lead to further research and better informed diagnosis in regards to psychomotor retardation. Manifestations of psychomotor retardation include slowed speech, decreased movement, and impaired cognitive function. It is common in patients with melancholic depression and those with psychotic features. Biological correlates may include abnormalities in the basal ganglia and dopaminergic pathways. Neurophysiologic tools such as neuroimaging and transcranial magnetic stimulation may play a role in the study of this symptom in the future. At present, there are three objective scales to evaluate psychomotor retardation severity. Studies examining the impact of psychomotor retardation on clinical outcome have found differential results. However, available evidence suggests that depressed patients with psychomotor retardation may respond well to electroconvulsive therapy (ECT). Current literature regarding antidepressants is inconclusive, though tricyclic antidepressants may be considered for treatment of patients with psychomotor retardation. Future work examining this objective aspect of major depressive disorder (MDD) is essential. This could further elucidate the biological underpinnings of depression and optimize its treatment.

Contents

Abbreviations: 99mTc-HMPAO, technetium-99m hexamethylpropylene amine oxime; AVP, arginine vasopressin; CANTAB, Cambridge Automated Neuropsychological Test Battery; COVA, Posner's covert orientation of visual attention test; CSP, cortical silent period; DST, dexamethasone suppression tests; DMS, delayed matched to sample; DRRS, Depressive Retardation Rating Scale; DSM IV-TR, Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision; DSST, symbol substitution test; ECT, electroconvulsive therapy; EEG, electroencephalography; EMG, electromyography; EOG, electro-oculogram; ERP, event related potential; GSM, Gibson Spiral Maze; HDRS, Hamilton Depression Rating Scale; HPA, hypothalamic–pituitary–adrenal; IBZM, iodobenzamide; ICF, intracortical facilitation; ICI, intracortical inhibition; IMPS, In-patient Multidimensional Psychiatric Scale; LPR, lifetime psychomotor retardation; MADRS, Montgomery–Asberg Depression Rating Scale; MAOI, monoamine oxidase inhibitor; MARS, Motor Agitation and Retardation Scale; mCPP, meta-chlorophenylpiperazine; MDD, major depressive disorder; MEP, motor evoked potential; MHPG, 3-methoxy-4-hydroxyphenylglycol; MOODS-SR, Mood Spectrum Self-Report Questionnaire; MT, motor threshold; NDRI, norepinephrine and dopamine reuptake inhibitors; PALT, paired associate learning subtest from the Weschler Adult Intelligence Scale; PME, premenstrual exacerbation; RRS-4, Short Version of Retardation Rating Scale for Elderly Patients; SCOLP, Speed and Capacity of Language Processing Test; SNRI, serotonin–norepinephrine reuptake inhibitor; SPECT, single photon emission computed tomography; SRRS, Salpetriere Retardation Rating Scale; SSRI, selective serotonin reuptake inhibitor; STAR*D, Sequenced Treatment Alternatives to Relieve Depression; TCA, tricyclic; TeCA, tetracyclic; TMS, transcranial magnetic stimulation; TMT, trail making test.

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doi:10.1016/j.pnpbp.2010.10.019

1. Introduction

Psychomotor retardation has been characterized as a major feature of depression since antiquity. Hippocrates and Aretaeus of Cappadocia both described psychomotor retardation as a characteristic of depression (Sobin and Sackeim, 1997; Whitwell, 1936; Zilboorg, 1944). Darwin also discussed visible psychomotor symptoms and depressed patients who "no longer wish for action but remain motionless and passive, or may occasionally rock themselves to and fro" (Dantchev and Widlocher, 1998; Greden and Carroll, 1981). In the proceeding decades, authors such as Kraepelin expanded on psychomotor retardation, building upon the knowledge of this noteworthy phenomenon by describing how it was more prominent than depressed mood and involved constrained speech, thought, and behavior (Greden and Carroll, 1981; Sobin and Sackeim, 1997).

Presently, psychomotor retardation is regarded as a key aspect of major depressive disorder (MDD) (American Psychiatric Association, 2000; Greden and Carroll, 1981; Widlocher, 1983). In the *Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision* (DSM IV-TR), it is one of the 9 core symptoms identified to diagnose MDD (American Psychiatric Association, 2000). Psychomotor retardation is also a principal symptom of MDD with melancholic features (American Psychiatric Association, 2000; Parker, 2005). Despite its long observed prevalence in MDD, the characterization and clinical significance of psychomotor retardation are poorly understood (Greden and Carroll, 1981; Sobin and Sackeim, 1997). This review will examine the biological correlates, measurement, and treatment implications of psychomotor retardation.

The aim of the paper is to provide a synthesis of the literature on psychomotor retardation in depression with the goal of enhanced awareness for clinicians and researchers. Increased knowledge and understanding of psychomotor retardation in major depressive disorder may lead to further research and better informed diagnosis in regards to psychomotor retardation. To carry out a systematic review, the lead author (JSB) performed independent searches in PubMed (1900–2010) database with the following terms: psychomotor retardation, major depressive disorder, motor, speech, melancholia, antidepressant, electroconvulsive therapy (ECT), and scale. The systematic review included only the articles that mentioned psychomotor retardation and at minimum, one other key search term in the abstract. Reference sections were also reviewed for additional sources. A total of 154 articles (English language literature) were included in this review. These studies were between the dates of 1936–2010, from Australia, Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Switzerland, United Kingdom, and United States; the methodologies and study designs varied.

2. Characteristics of psychomotor retardation

2.1. Observable characteristics

Psychomotor retardation is unique in regards to depressive symptomatology as it is assessed through direct behavioral observations of speech, facial expression, eye movements, self-touching, posture, and speed and degree of movements (Jones and Pansa, 1979; Parker and Hadzi-Pavlovic, 1996; Sobin and Sackeim, 1997; Widlocher, 1983). Speech has been extensively studied in the context of depression and psychomotor retardation (Greden et al., 1981; Hardy et al., 1984; Sobin and Sackeim, 1997; Szabadi et al., 1976). Specifically, investigations have involved observations of pause and speech times, volume, tone, inflection, articulation, and response length (Greden et al., 1981; Greden and Carroll, 1981; Hardy et al., 1984; Sobin and Sackeim, 1997; Szabadi et al., 1976). Clinicians can easily assess marked speech abnormalities such as gross changes in volume and prosody (Greden, 1993). Characteristic eye movements of patients with psychomotor retardation are fixed gaze and poor maintenance of eye contact (Sobin et al., 1998; Widlocher, 1983). Another characteristic symptom is gross psychomotor slowing, including movement of the hands, legs, torso, and head (Parker and Hadzi-Pavlovic, 1996; Sobin et al., 1998; Widlocher, 1983). Slumped posture is also a manifestation of psychomotor retardation (Parker and Hadzi-Pavlovic, 1996; Sobin et al., 1998; Widlocher, 1983). In addition, patients with psychomotor retardation have been found to engage in increased self-touching, especially of the face (Sobin and Sackeim, 1997).