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Anosognosia and patterns of impaired self-awareness observed in clinical practice

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ABSTRACT

Disturbances of self-awareness are observed in a wide variety of patients. While group studies can provide useful information concerning potential mechanisms underlying these complex disturbances, experienced clinicians, such as Babinski, recognized the potential value of repeated observations on individual patients to insure the reliability of findings and to aid in diagnosis. This paper describes patterns of impaired self-awareness (ISA) that are observed in clinical practice that suggest a model for clinical classification. Repeated observations are reported on four patients ranging from anosognosia for hemiplegia (AHP), ISA associated with bilateral cerebral dysfunction with frontal lobe involvement, and apparent denial of disability (DD). A patient who presents with denial of ability (DA) is also studied for comparison purposes. When coupled with brain imaging findings, the nature of the patients' subjective responses to feedback regarding their functional capacities, speed of finger tapping in the left, nondominant hand, and their capacity to express and perceive affect suggests different clinical correlates in these four conditions.

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1. Introduction

In June of 1914, Felix Babinski gave us the term “anosognosia” (Bisiach & Geminiani, 1991), although many agree that the lack of self-perception of neurological deficits was described by such clinicians as Gabriel Anton and Arnold Pick before the term came into existence (Prigatano & Schacter, 1991). Over the last 100 years, numerous clinical and experimental observations have been reported regarding anosognosia, particularly anosognosia for hemiplegia (AHP) after stroke (e.g., Garbarini et al., 2012; Jenkinson, Edelstyn, & Ellis, 2009; Morin, Pradat-Diehl, Robain, Bensalah, & Perrigot, 2003; Orfei

et al., 2007; Vocat & Vuilleumier, 2010; Vocat, Saj, & Vuilleumier, 2013). It has become progressively clear that while AHP is a striking phenomenon that still attracts considerable neuroscientific attention, disturbances in self-awareness can be observed in a wide variety of neurological and psychiatric patients (Prigatano, 2009, 2010). They include post-acute patients with severe traumatic brain injury (TBI) (Prigatano & Altman, 1990; Sherer et al., 1998), multiple sclerosis (MS) (Prigatano, Hendin, & Heiserman, 2014), Parkinson's disease (Maier, et al., 2012), dementia of the Alzheimer's type (Salmon et al., 2006), mild cognitive impairment of the amnesic type (Ries et al., 2007), and frontotemporal dementia (Miller et al., 2001). This clinical reality has to be kept in mind when

developing theoretical models for explaining anosognosia and related phenomena.

A second clinical reality is that while anosognosia is a direct effect of brain dysfunction (Bisiach & Geminiani, 1991) often reflecting cortical lesions (Fotopoulou, Pernigo, Maeda, Rudd, & Kopelman, 2010; Prigatano, 2010) not all disturbances in self-awareness in brain dysfunctional patients necessarily represent a neuropsychological disturbance (Weinstein & Kahn, 1955). Denial and repression, as psychological methods of coping, may also contribute to their altered subjective perceptions (and verbalizations) about their functional capacity (Prigatano & Weinstein, 1996; Ramachandran, 1994). This has prompted a more detailed analysis of the relationship of anosognosia to mood states (Mograbli & Morris, 2014) as well as exploration of the various correlates of implicit awareness in anosognosia (Fotopoulou, et al., 2010; Mograbli & Morris, 2013).

Present-day studies of anosognosia and related phenomena may be enhanced by case reports that reveal different types of disturbances in self-awareness observed in clinical practice. Correlates of improved self-awareness of neurological and neuropsychological disturbances, as well as the correlates of persistent and worsening impaired self-awareness (ISA) may provide further insights as to underlying mechanisms responsible for these complex disturbances.

1.1. Psychological and neurological (neuropsychological) perspectives when evaluating patients with ISA

Between October of 1885 and the end of February, 1886, Sigmund Freud studied with Charcot at the Salpêtrière in Paris. During this time, Babinski was Charcot's Chief Resident. Reportedly, Freud and Babinski both examined a patient together and presented their findings to Charcot. Freud reported that the relationship with Babinski was cordial, but not especially warm. It has also been noted that Freud's name did not appear in any of Babinski's publications (Philippon & Poirier, 2009, pg. 314).

While there has been an effort to study psychoanalytic concepts/constructs using the methods of present-day neuroscience (Carhart-Harris & Friston, 2010; Fotopoulou, Pfaff, & Conway, 2012; Shevrin, Ghannam, & Libet, 2002; Solms & Turnbull, 2002; Thibierge & Morin, 2013), necessary clinical details are often lacking when interpreting the behavior of individual anosognostic patients. The well-recognized report by Ramachandran (1994) highlights the problem. Ramachandran (1994) described in a clinical vignette fashion verbalizations of a 76-year-old woman who presented with AHP. Her comments were classical for this condition, and repeated similar earlier (more detailed) observations by Sandifer (1946). He then described a second patient, a 79-year-old woman with AHP, and reported her responses to questions after undergoing a caloric stimulation test, known to briefly eliminate neglect and anosognosia (Ronchi et al., 2013). Immediately after the stimulation, the patient reported that her left hand/arm was paralyzed. Several hours later, when the effect has worn off, the patient reverted back to describing herself as having no difficulties with her left hand and arm. Ramachandran (1994) then provided the following verbatim accounts:

“Examiner: This morning, two doctors did something to you. Do you remember?”

Patient: Yes. They put water in my ear; it was very cold.

Examiner: Do you remember they asked some questions about your arms, and you gave them an answer? Do you remember what you said?

Patient: No, what did I say?

Examiner: What do you think you said? Try and remember.

Patient: I said my arms were okay.” (pg. 323–324)

Ramachandran interpreted the patient's response as indicating that the patient, at some level, had a much deeper knowledge of her paralysis than her earlier verbalizations indicated. He evoked the concept of repression to explain her behavior. It would have also been helpful to ask the patient when she said that she had previously said her arm was okay, whether or not she believed that to be true. Was the patient simply reporting what she remembered, or was she reporting what she experiences/believed in the present? Furthermore, detailed description of how the patient dealt with anxiety-provoking events in her life may have been of some help to clarify whether or not repression/denial contributed to her verbalizations about her disability. In typical scientific publications, such detailed clinical analysis is often not presented since case reports are thought to be limited in the knowledge they provide.

In the spirit of Babinski who believed in the importance of repeated clinical observations on individual patients in order to determine the reliability of a given phenomenon, four cases are presented. While they differ in their diagnoses, they share the common feature of showing a disturbance of self awareness of either a neurological or neuropsychological function. Their verbal (subjective) responses to questions asked about their functional capacities were studied and compared. Their emotional responses to questions and to neuropsychological testing procedures were recorded. Their ability to generate affect in their tone of voice, perceive facial affect, and demonstrate spontaneous affect were tested since these emotional features may be impaired in anosognosia (Heilman & Harciarek, 2010). Speed of finger tapping, using the Halstead Finger Tapping Test (HFTT) was also measured in each patient. This task distinguishes TBI patients with ISA from those without this disturbance (Long, Rager, & Adams, 2014; Prigatano & Altman, 1990). It has also been shown to be associated with ISA in Parkinson patients (Maier et al., 2012) and a patient with MS (Prigatano et al., 2014).

2. Methods

2.1. Participants

Four patients who were referred for clinical neuropsychological evaluations were studied longitudinally. Each patient demonstrated disturbance of self awareness of either their neurological or neuropsychological functional capacities. Each patient provided written informed consent to utilize their clinical information for research purposes. Case 1 presented with AHP following a right cerebral vascular accident (CVA). Case 2 presented with ISA (ISA) for her cognitive

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