Phenomenological characteristics of autobiographical memory in Korsakoff’s syndrome

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ABSTRACT

A body of research suggests compromise of autobiographical memory in Korsakoff’s syndrome (KS). The present paper extends this literature by investigating the subjective experience of autobiographical recall in the syndrome. Patients with KS and controls were asked to retrieve autobiographical memories. After memory retrieval, participants were asked to rate phenomenological characteristics of their memories (i.e., reliving, back in time, remembering, realness, visual imagery, auditory imagery, language, emotion, rehearsal, importance, spatial recall and temporal recall). Analysis showed lower “Mean Phenomenological Experience” in the Korsakoff patients than in controls. However, the Korsakoff patients attributed relatively high emotional value and importance to their memories. Although our findings suggest compromised phenomenological reliving of autobiographical memory in patients with KS, affective characteristics such as emotion and importance are likely to play a main role in the subjective experience of the past in these patients.

1. Introduction

Korsakoff’s syndrome (KS) is an amnesic disorder caused by chronic thiamine deficiency and alcohol abuse and resulting in lesions in the diencephalon, particularly the mammillary bodies and the thalamus (Kessels & Kopelman, 2012). At the cognitive level, KS is mainly characterized by a profound anterograde memory deficit (i.e., impaired ability to remember events that occurred after the onset of the syndrome) as well as retrograde amnesia (i.e., impaired ability to remember events that occurred before the onset of the syndrome) (Fama, Pitel, & Sullivan, 2012). Memory compromise in KS can be observed on both encoding and retrieval, with encoding being disproportionately more impaired than retrieval (Pitel et al., 2008). Memory compromise in KS can be associated with executive dysfunction, itself related with frontal lobe dysfunctions (Brion, Pitel, Beaunieux, & Maurage, 2014; Kopelman, 1991). Studies demonstrate impairment of global executive function (Maharasingam, Macniven, & Mason, 2013; Van Oort & Kessels, 2009), as well as impairment of specific executive functions such as shifting (Fama, Marsh, & Sullivan, 2004) and updating (Hildebrandt, Brokate, Eling, & Lanz, 2004) in KS patients. KS has been specifically associated with disinhibition and perseverative responses (Fujiiwara, Brand, Borsutzky, Steingass, & Markowitsch, 2008; Oscar-Berman, 2012). Another cognitive domain that has been found to be impaired in KS is emotion (Brion, D’Hondt, Davidoff, & Maurage, 2015), as KS patients may demonstrate altered affective judgements, apathy or irritability (Douglas & Wilkinson, 1993; Johnson, Kim, & Risse, 1985), as well as a tendency to overestimate the affective content of neutral stimuli (Labudda, Todorovski, Markowitsch, & Brand, 2008). They also demonstrate impaired facial expression recognition, particularly for fear, anger and surprise (Montagne, Kessels, Wester, & de Haan, 2006).

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The present paper assessed the phenomenological experience of autobiographical memory in KS. Autobiographical memory refers to memory of personal experiences (Conway, 2005), an ability that allows individuals to define themselves, construct a life story and attribute meaning to it (El Haj, Antoine, Nandrino, & Kapogiannis, 2015). Autobiographical memory encompasses memories with different levels of specificity ranging from general knowledge about one’s past (i.e., semantic autobiographical memories) to highly contextual-specific episodic autobiographical (Kopelman, 1994). The latter knowledge involves a state of autonoetic consciousness by which the phenomenological (i.e., subjective) experience of the past is relived thanks to mental time travel (Tulving, 2002). At the neuroanatomical level, autobiographical memory involves the hippocampus and related para-hippocampal regions, as well as the medial and lateral prefrontal regions (Cabeza & St Jacques, 2007). It also involves the posterior midline regions (precuneus, posterior cingulate) and the visual processing regions (occipital cortex, ventral temporal cortex) (Rugg & Vilberg, 2013; Svoboda, McKinnon, & Levine, 2006), as well as regions associated with emotion processing including the amygdala, orbitofrontal cortex and insula (Cabeza & St Jacques, 2007), probably because autobiographical retrieval involves emotional experience.

Autobiographical memory has been found to be compromised in KS. Kopelman (1989) asked participants with KS to produce personal memories of childhood, young adult and recent life. They were encouraged to produce specific events rather than to give a general description of things they used to do and to describe when and where it happened. Results showed significant difficulties in retrieving recent memories in participants with KS. Results also showed difficulties in retrieving childhood memories, which is consistent with Korsakoff’s (1889) own observation that retrograde loss in the syndrome may extend back many years or decades. Mirroring the findings of Kopelman (1989), subsequent research has suggested difficulties in retrieving autobiographical memories in KS (El Haj, Kessels, et al., 2016; Kopelman & Kapur, 2001; Kopelman, Stanhope, & Kingsley, 1997, 1999). These difficulties have been linked to confabulations, i.e., memories that are fabricated or distorted, without the conscious intention to deceive (Dalla Barba & Decaix, 2009; El Haj & Laroi, 2017; Gilboa, 2010; El Haj, 2010; Schneider, 2000). According to Dalla Barba, Cipolotti, and Denes (1990), confabulations occur in KS when patients try to retrieve autobiographical events with more details than are actually available. Compromise of autobiographical memory in KS can also be related to difficulties in retrieving contextual information, i.e., where and when an autobiographical event occurred for a review, see, (Kessels & Kopelman, 2012). Not surprisingly, Korsakoff (1889) himself emphasized the difficulty of his patients in retrieving contextual details, particularly temporal ones. The compromise of autobiographical memory in KS was also observed by Rensen et al. (2017) who examined whether differences between two evaluations of autobiographical memory influence the presence of a temporal gradient in semantic and episodic autobiographical memories. The authors found that both evaluations showed a temporally graded retrograde amnesia for personal semantic and episodic autobiographical memories.

Although it is well established that patients with KS show compromise of autobiographical memory, there is a lack of research about the phenomenological experience that characterizes their autobiographical retrieval. It is widely acknowledged that retrieval of specific memories implies mentally travelling back in subjective time (i.e., autonoetic consciousness), whereas retrieval of general memories implies a general sense of familiarity (i.e., noetic consciousness) (Tulving, 2002). Because phenomenological experience has been considered as a core element of remembering (Tulving, 2002), the present paper assessed how patients with KS would describe their conscious experience during autobiographical recall.

The phenomenological experience of autobiographical memory has been assessed in the general population (D’Argembeau and Van der Linden, 2012; Gandolphe & El Haj, 2016; Janssen, Rubin, & St. Jacques, 2011; Maki, Janssen, Uemiya, & Naka, 2013) as well as in non-amnesic alcohol-dependent patients. In a study by D’Argembeau et al. (2006), non-amnesic alcohol-dependent patients (i.e., without KS) were asked to retrieve one positive and one negative autobiographical event and to fill in a scale of conscious experience. They had to rate the amount of visual details, sounds and smell/taste that might characterize their recall, as well as spatiotemporal specificity. Participants also reported the visual perspective they took in their memory depending on whether they “saw” themselves in their memory or saw the scene from their own perspective. Finally, they rated the emotional valence of their memories. D’Argembeau et al. (2006) reported a similar rating for spatiotemporal specificity, visual imagery, and emotional valence in both non-amnesic alcohol-dependent patients and controls. The patients also showed a trend towards subjectively experiencing more sensory details (i.e., amount of visual details, sounds, smell/taste) than controls when remembering positive past events.

The phenomenological reliving of autobiographical memory in alcohol-dependence was also assessed for flashbulb memories, i.e., memories of attributes of the reception context of surprising and emotionally arousing public events (Brown & Kulik, 1977). This issue was investigated in a study assessing flashbulb memories for the Paris attacks in a non-amnesic patient who had been abstinent for two years (El Haj & Gandolphe, 2017). The patient retrieved many details about how he first became aware of the attacks (i.e., high flashbulb memories). Interestingly, he also demonstrated high subjective reliving (visual imagery, auditory imagery, and mental time travel), a vividness that was attributed to the surprising and shocking characteristics of the attacks. As for KS, a study assessed flashbulb memories of September/11/2011 in 15 KS patients (Candel, Jelicic, Merckelbach, & Wester, 2003). Despite their severe amnesia, the patients displayed flashbulb memories, however, the study did not assess the subjective experience of these memories. Together, studies to date suggest the preservation of some phenomenological characteristics of autobiographical recall in non-amnesic alcohol-dependent patients. Because autobiographical memory is typically more compromised in KS than in non-amnesic alcohol dependence (Kopelman, 1994), it would be of interest to investigate the extent to which the phenomenological experience of autobiographical memory is compromised in KS.

The phenomenological reliving of autobiographical recall in KS can be assessed in the light of a study in patients with Alzheimer’s disease (the latter population may serve as a comparison group as it suffers amnesia with no background of alcohol abuse) (El Haj, Kapogiannis, & Antoine, 2016). The study used a comprehensive scale taking into account four main components of phenomenological reliving: (1) metacognitive judgments (i.e., reliving, back in time, remembering, and realness), (2) component processes (i.e., visual imagery, auditory imagery, language, and emotion), (3) narrative properties (i.e., rehearsal and importance), and (4)
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