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The emergence of obsessive compulsive and compulsive buying symptomatology after acute stress and short-term use of ribavirin: case reports

Görkem Karakaş Uğurlu, Mustafa Uğurlu and Ali Çayköylü

Correspondence to:

**Görkem Karakaş
Uğurlu, MD**Ministry of Health Ankara
Atatürk Training and
Research Hospital,
Bilkent road, Number: 3
Bilkent / Ankara 06800,
Turkeydr_gorkem@yahoo.com**Mustafa Uğurlu, MD**Department of Psychiatry,
Ministry of Health Ankara
Atatürk Training and
Research Hospital,
Republic of Turkey**Ali Çayköylü, MD**Department of Psychiatry,
Yıldırım Beyazıt University
Ankara Atatürk Training
and Research Hospital,
Republic of Turkey

Introduction

Neuropsychiatric side-effects have been reported in up to 60% of patients undergoing treatment with antiviral agents [Evon *et al.* 2009]. Most of them (48%) were depressive disorders. More rarely, signs and symptoms associated with anxiety, sleep, memory and attention disorders were observed [Lockett *et al.* 2003; Ward and Curtin, 2006]. Ribavirin, an antiviral agent, has also been reported to cause some psychiatric syndromes, however it is stressed that these effects are often enhanced by the psychiatric side-effects of the other antiviral agents (such as interferon alpha) which are often used together [Reichard *et al.* 1997; Martin-Santos *et al.* 2008]. We would like to report a case of single-agent ribavirin-induced compulsive buying.

The purpose of this case report is to draw attention to obsessive compulsive spectrum disorders (OCSs) such as compulsive buying, which, although not defined as a disorder by the DSM and ICD, may cause clinically significant disability, and also to its etiology of biological and psychological explanations.

A 34-year-old woman presented to our clinic with obsessive fears of becoming contaminated by microbes whenever she touches any item, continuous thoughts of having forgotten to turn the lights off and close windows and doors, uncontrolled repetitive behaviors in the form of a compulsive need to constantly check the doors or lights or continuously wash her hands. She also had sudden and intense desires to shop and purchase things needlessly. When she postponed the desire to shop, she experienced severe discomfort and restlessness. She gained relief by buying unnecessary things, hence she faced economical problems due to excessive expenditure, resulting in regret and anxiety feelings.

Three weeks prior to her application, she received a prophylaxis treatment consisting of 1000 mg/day oral ribavirin applied for 7 days since she had pricked her finger with a syringe that had been used on a patient with Crimean-Congo hemorrhagic fever disease. During the medication usage she had no complaint other than a feeling of dizziness and lack of concentration. The prophylaxis treatment for Crimean-Congo hemorrhagic fever disease was completed and the disease did not appear. The aforementioned psychiatric symptoms and complaints started a week after the completion of this treatment with ribavirin.

It was determined via psychiatric examination that she was in an anxious–angry mood, her thoughts included suspicion and contamination obsessions, control and washing compulsions, and intense desire to go shopping; her behavior of purchasing unnecessary things was noted and, after purchasing, she experienced thoughts of guilt. Routine hematological and biochemical parameters were normal. Tests also revealed a Beck Depression Inventory score of 6, Beck Anxiety Inventory score of 7, Yale–Brown Obsessive Compulsive Scale score of 15, Brief Symptom Inventory overall average symptom score of 0.51, obsessive–compulsive symptoms subscale score of 1.3, and interpersonal sensitivity subscale score of 0.66.

The patient had received 6 months' treatment with paroxetine 20 mg/day for the diagnosis of depressive disorder after her father's death in 2004. She recovered after this treatment and had not had any psychiatric complaints since then. She had no other medical disease. Her aunt was receiving treatment for a diagnosis of obsessive–compulsive disorder (OCD).

As a result of these signs and symptoms, cognitive-behavioral treatment was planned with this patient, diagnosed with ribavirin-induced sub-threshold OCD and compulsive buying (an impulse control disorder not otherwise specified [ICD-10 F63.9]).

A decrease in obsessive-compulsive complaints was seen in the second week. Behavioral recommendations were given for compulsive buying (make a list before shopping, take only enough cash for the items on the list, do not use a credit card, do not go shopping alone). After 1 month of treatment the obsessive-compulsive symptoms disappeared completely but, although at a decreased level, the patient's complaints of compulsive buying still continued.

Discussion

With this case, besides discussing the position of compulsive buying in psychiatry practice and its relationship with OCDs, the possibility of immunological and psychological mechanisms in its etiology is also discussed.

Compulsive buying can be evaluated as a separate clinical entity or may take place in the category of impulse control disorders [Schlosser *et al.* 1994; McElroy *et al.* 1995]. Also, in this case, the symptoms of compulsive buying were intertwined with subclinical OCD. Besides this association (comorbidity), these similarities, which are held responsible for the etiology in the properties of neurotransmitter dysregulation, demographic, clinical and treatment response, cause these clinical entities to be considered in the same spectrum [Ravindran *et al.* 2009].

As with the other OCSDs, together with the etiology of compulsive buying not being clear, developmental, neurobiological, cultural and psychological factors are thought to be effective [Aboujaoude and Koran, 2010]. There are studies in OCSD that demonstrate disruptions in the corticostriatal system and also there are similarities in the hypotheses related to the etiology of OCD [Hounie *et al.* 2007; Fontenelle *et al.* 2011]. The effect of the immune system in the etiology of OCD and therefore OCSD has been observed [Swedo *et al.* 1989; Montgomery, 1994; Sasson and Zohar, 1996]. It is thought that the natural immune response and immune cytokines affect the monoamine system in general, having a particular influence on the serotonergic and

dopaminergic systems, and therefore can cause affective, cognitive and behavioral changes [Kronfol and Remick, 2000; Dantzer *et al.* 2008; Miller, 2009].

There are reports related to some drugs that also include antiviral agents that caused OCD and OCSD [Jonkers and De Haan, 2002; Voon *et al.* 2007; Alexander, 2009; Di Nicola *et al.* 2010]. Ribavirin is a broad-spectrum antiviral drug that is not widely used and therefore its psychiatric side effects are not known [Sidwell *et al.* 1972]. In some case reports, where ribavirin was used in conjunction with other agents such as interferon-alpha, it has been reported that psychiatric side effects occurred, including depression, fatigue, anxiety symptoms, cognitive impairment and a decrease in quality of life [Maddock *et al.* 2005; Abdel-Salam, 2006]. The mechanism behind the neuropsychiatric side-effects occurring due to ribavirin is not understood. It is thought that many drugs induce the production of antidrug antibodies at a finite rate. Although these antibodies do not usually cause clinical symptoms, they can rarely cause severe degrees of clinical cases [Shankar *et al.* 2008]. As far as we know, there is no data about the formation of antibodies related to the usage of ribavirin.

Independent of its antiviral effect, ribavirin is an agent that reduces the necro-inflammatory response and synthesis of proinflammatory cytokines [Hoofnagle *et al.* 2003; Barnes *et al.* 2004]. It also has immunomodulatory and reinforcing effects on T helper 1 (Th1) cells, and it causes modulation or immunosuppression in cytokine profiles and lymphocyte differentiation patterns [Hultgren *et al.* 1998; Tam *et al.* 1999; Fang *et al.* 2000; Lavrnia *et al.* 2008]. It can be speculated that the effects of ribavirin on the immune system, as argued in previous studies of OCD immune theory, may cause a delay in corticostriatal activity.

A large number of neurobiological and psychological studies have been conducted on the psychopathological consequences of acute stress. The relationship between stress and post-traumatic stress disorder is particularly well known and, as in OCD, there are common features, such as repetitive intrusive cognition [Rachman and Hodgson, 1980; Marks, 2001].

Acute stress can cause quantitative and functional changes in the cortisol, involving

dihydroepiandrosterone, corticotropin-releasing hormone (CRH), locus coeruleus and norepinephrine systems, neuropeptide Y, galanin, dopamine, serotonin, benzodiazepine, GABA, gonadal steroids, antibody production and suppressor/cytotoxic and natural killer (NK) cell populations [Cohen *et al.* 2001; Marsland *et al.* 2001; Charney, 2004; Hasler *et al.* 2010].

In compulsive situations, people respond with a variety of coping strategies [Hareven and Adams, 1982]. Especially intense negative emotions can lead to problematic behaviors such as alcohol or psychotropic substance use and gambling, self-injurious behavior and compulsive buying [O'Guinn and Faber, 1989; Marks, 2001; Miltenberger *et al.* 2003; Nock and Prinstein, 2004; Selby *et al.* 2008]. Hirschman mentioned that the stress of self-concept can result in a search for various types of symbolic self-complement [Hirschman, 1992]. In this way, compulsive consumption temporarily helps the repair of self-concept [Rindfleisch *et al.* 1997]. At the same time, compulsive buying, with the advantage of euphoria, can be considered as a coping strategy during the depression or other negative emotions [Faber and Christenson, 1996; Dittmar and Drury, 2000].

We have contributed to the biological and psychological literature in the field of psychiatry for many years and, ultimately, this has led us to the formation of the concept of 'biopsychosocial'. In the etiology of psychiatric disorders, biological (in this case, the possible immunological effects of drugs), psychological (in this case, the effect of trauma on emotions, thoughts and behaviors), or biopsychosocial (in this case, the effect of possible structural or immunologic changes caused by psychological trauma on emotions, thoughts and behaviors) explanations are important in determining the correct treatment approaches.

Although it was a constraint that the necessary immunological research could not be made in this case, we think that the compulsive buying that occurred in this patient, who has a familial predisposition to OCD, was triggered by the usage of ribavirin or a psychological stressor. Therefore, whether the effects of ribavirin or psychological stressor on the immune system caused disruption in corticostriatal activity and/or created the ground for OCSD is worthy of controlled clinical and immunological studies.

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