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Hoarding disorder and cerebellum damage. A case study.

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Summary

Hoarding disorder is defined as an extensive collecting and difficulty in discarding objects and items perceived by others as not useful or having low value. As a consequence it leads to numerous problems which impact not only the patient but also his/her family and other people (e.g., residents of the same block of flats). The frequency of hoarding disorder in the United States and Europe is estimated as 2—6%. In the new classifications of psychiatric disorders (DSM-5 and ICD-11), hoarding disorder is classified as a separate disorder. The scientific research shows that hoarding disorder has specific neurobiological determinants affecting mainly the cingulate gyrus, frontal cortex and insula. These regions are connected with the cerebellum with the so-called cortical-limbic loops. This suggests that the cerebellum damage may result in the development of hoarding disorder. The presented case study concerns the patient suffering from hoarding disorder with an atrophy of the cerebellar cortex and cerebellar vermis indicated by brain imaging (computer tomography and magnetic resonance imaging of the head). It was excluded that hoarding disorder may be a symptom of other psychiatric disorders. No abnormalities were found in the somatic and neurological state of the patient. On the basis of the cited research studies it may be assumed that in the case of the discussed patient, the cerebellum damage was a cause of hoarding disorder development.

Key words: hoarding disorder, cerebellum, neurobiology

Introduction

Hoarding disorder is a kind of behavior associated with an excessive acquisition and difficulty in discarding goods of various kinds usually perceived by others as useless or worthless. With time, the number of accumulated items reaches a point when the patients (together with their family and friends) are unable to use their living quarters freely. It leads to numerous family, social, financial, legal, health, and epidemiological problems and as a consequence to a significant decline in patients' living quality and functioning. It is estimated that currently 2—6% of population of the USA and Europe suffers from hoarding disorder [1].

The first case of hoarding disorder was discussed in 1966 by Macmillan and Shaw [2]. In 1975, Clark and et al. [3] introduced a name 'Diogenes syndrome' to determine the disorder which is widespread mostly among elderly patients. The syndrome was characterized by an uncontrolled compulsive goods collection and neglecting of personal care. Over the years many different terms of the disorder were introduced. These were mainly: syllogomania, hoarding syndrome, Messy syndrome or Pliuszkin syndrome [4].

Nosological position of hoarding disorder in ICD-11 and DSM-5

In the new classifications of psychiatric disorders, the nosological position of hoarding disorder has been changed. In DSM-5 published in 2013, hoarding is claimed to be a separate disorder while in DSM-IV it was listed as one of the obsessive-compulsive disorder symptoms. The adequate changes were introduced in the international classification supported by WHO. While in ICD-10 the diagnosis does not appear, in ICD-11, publication of which is planned for 2018, the diagnosis of 'syllogomania', which belongs to a group of 'Obsessive-compulsive or related disorders', is included [5]. Moreover, it should be noted that in DSM-5 a distinction of this disorder to primary and secondary form has been introduced. The criteria eliminating a recognition of its primary form are the symptoms of hoarding directly emerging from the symptoms of other psychiatric disorders (e.g., obsessions-compulsions in OCD, cognitive impairment in dementia, delusions in schizophrenia, narrowed interests in autism spectrum disorder) and other medical problems (e.g., head injury, cerebrovascular disease, infection of the central nervous system or Prader-Willi syndrome [1].

As the above considerations show, hoarding disorder needs to be differentiated especially from obsessive-compulsive disorder (OCD). According to the statistics, 18—33% of patients with OCD suffer from an extensive goods collection but only for 5—10% of them the symptoms are significantly intense. However, in hoarding disorder, for more than a half of patients (50—70%) no symptoms of OCD were claimed [4]. There are several significant differences between primary hoarding disorder and a secondary one in OCD. Firstly, patients with the primary form usually reveal lack of insight, while most patients with OCD have insight toward their symptoms. The emotional context associated with the process of items collection is also of an utmost importance. In the primary form, it is a deliberate activity that usually ends up with a sense of award and satisfaction. On the other hand, hoarding as a compulsive symptom, so a compulsory one, is perceived by the patients as a pointless, stressful, unpleasant and embarrassing one. Patients belonging to this group are usually embarrassed with their behavior while gathering the items, however, performing a given action is a source of temporary tension and anxiety reduction. The differences may also be found in the kind of gathered objects. In the primary form, these are usually various kinds of free samples, newspapers, leaflets or the items that were thrown away by other people. Compulsive hoarding may apply to bizarre objects collection like hair, nails, used diapers or even urine. There is also a discrepancy in the course of disorder. Primary hoarding becomes more extensive

with every decade of life, while hoarding as a symptom of OCD reduces gradually with the disorder course [4, 6].

Neurobiological basis of hoarding disorder

The new classification position of hoarding disorder was a reason of an intensification of research of its pathogenesis. In the last years, several new research studies on neurobiology of hoarding disorder has appeared. They show that patients suffering from it have lesions in specific parts of the brain. This is, according to the authors, an evidence for classification of hoarding as a separate disorder with specific neurobiological determinants. The described changes are associated mainly with the cingulate gyrus, frontal cortex and insula, so the parts that are responsible for a model of hoarding. Currently, it is known that the cerebellum has numerous connections with other parts of the brain. The parts connected with the cerebellum by the so-called cortical-limbic loops are among others the anterior cingulate cortex and fronto-insular cortex [7], which suggests that the damage of the cerebellum may result in hoarding disorder.

At the beginning, hoarding was treated as a symptom of other disorders. In 2004, Saxena et al. [8] published their research results conducted using Position Emission Tomography (PET) on two groups of patients. The first one was a group of 33 patients suffering from OCD without a symptom of hoarding, the other one were 12 OCD patients with the hoarding symptom. 17 healthy people were a control group. It turned out that patients with OCD with the hoarding symptom had lesser glucose metabolism in the anterior and posterior cingulate cortex when compared with OCD patients without the hoarding symptom [8].

In 2012, Tolin et al. [9] published a research, conducted with the use of Functional Magnetic Resonance Imaging (fMRI), the aim of which was to evaluate neuronal activity when making decisions associated with keeping or disposing of specific items. 107 adult patients were examined. 47 out of them were diagnosed with primary hoarding disorder, 31 had obsessive-compulsive disorder and 33 healthy participants were a control group. In the research, it was pointed out that the patients with the primary hoarding disorder had abnormal activity in the anterior cingulate cortex and insula when compared with the patients with OCD and the control group. Moreover, differences in the activity of these parts of the brain were dependent on the quality of stimulus — in this case, whether the given item was patient's possession or not. In the case when the patient was not an owner of the item, their neuronal activity was relatively lower, while when the decision was about their possessions, more extensive activity was observed in the aforementioned parts of the brain [9].

In 2014, Tolin et al. [10] published their research, the aim of which was to compare hemodynamic answer in fMRI in patients with primary hoarding disorder (HD), OCD and in the control group during performing Go/NoGo task. Each group consisted of 24 patients. The task was about performing or resisting from performing an activity (pressing a button) depending on a presented stimulus. During the right suppressing of the reaction, patients with HD showed higher activity of the right precentral gyrus when compared with patients with OCD. On the other hand, patients with OCD were

observed to have higher right orbitofrontal cortex activity when compared with patients with HD. During invalid suppressing of reaction some modifications were claimed only for patients with OCD. They showed an extensive activity of the right and left orbitofrontal cortex. It allowed to make a hypothesis that patients with HD have frontal hypoactivity during dealing with tasks not associated with hoarding disorder [10].

Case study

50-year-old man with secondary education, unemployed, psychiatrically hospitalized for the third time. The patient has been gathering huge numbers of various items in his four-room flat for ten or fifteen years, those were mostly newspapers and books. The process impeded normal functioning of the numerous family (wife and six children). The gathered items disenabled a free usage of the living quarters. With the years, special corridors among the piles of newspapers and books that were reaching the ceiling were created in the flat and were the only possibility of moving between the parts of the flat. This situation forced his wife and children to move to one-room flat belonging to the oldest son.

From the medical history it is known that the patient has been treated in the mental health center for children and teenagers since he was 4 years old with the neurosis diagnosis (he was born from pathological pregnancy — gestosis, fetal asphyxia, delivery by Caesarean section). From 8 years old to 11 years old he was in neuropsychiatric sanatorium. At the age of 21, he was registered in mental health clinic for adults, where he was treated for personality disorders in a person with CNS damage. At the age of 26, he was psychiatrically hospitalized for the first time (juridical-psychiatric observation). He was diagnosed with features of histrionic personality disorder in a person with slight organic changes. At the age of 43, he was hospitalized again with court's decision on his wife request. The electroencephalographical and psychological diagnosis did not point out the organic reason for the disorders. Based on the MMPI test, paranoid personality was diagnosed. The patient did not suffer from any chronic disease and in his somatic state no deviations from the norm were claimed.

During the current — third observation, medical interview from the patient's wife was conveyed. She confirmed that all parts of the four-room flat are filled out with objects gathered by her husband (books, newspapers, clothes, junk, etc.). Few years before, the housing cooperative organized rubbish disposal, charging the family with its costs. The volume of objects was so big that the rented truck had to be used three times to place all the objects in the refuse dump. The patient could not come to terms with his loss being convinced about the high financial value of the gathered items. Each time he was trying to catch up with the truck making an attempt to take the items back to his flat. Currently, due to the debt associated with unpaid rent, the patient was obliged by the court to sell the flat. Nonconforming to this decision has resulted in an order to declutter and sell the place under the threat of eviction within two weeks. The conflict with the housing cooperative was intensified by the fact that the patient started to gather the items collected in the refuse dump in various places on the cooperative territory (apart from his flat also on the staircase, in basement corridors and in

basements belonging to other residents). Moreover, he also managed to obtain a key to the basement in the block of flat currently occupied by his wife and children. In this place, he also started to gather huge numbers of items.

During hospitalization, the patient was obtaining a pass associated with an obligation to tidy up his flat. He was emphasizing the fact that he did not agree to declutter it not according to his 'plan'. He blamed his family members that they threw away the items he needed. During decluttering the flat by his family, he was still bringing other objects. Those were, for instance, cans, collection of which was determined by the possibility of earning some money, and therefore having an additional source of financial income.

During hospitalization head CT scan was performed. It showed that the brain and posterior cranial fossa structure do not have any focal lesions. Developmental variant of the ventricular system in the form of septum pellucidum cyst and Verga's ventricle was claimed. The ventricular system was not dilated and not displaced. Other intracranial areas were normal as well. The examination showed an atrophy of the cerebellar vermis and cerebellar hemispheres.

Discussion. Can cerebellum damage result in hoarding disorder?

The above case study concerns a patient for whom, in the light of new diagnostic criteria, hoarding disorder diagnosis if fully justified. The patient was examined with CT — an atrophy of the cerebellar vermis and cerebellar hemispheres was diagnosed. In this case, the question about the relationship between the diagnosed changes in the cerebellum and patient's symptoms. Currently, it is known that the cerebellum damage is not only associated with motor dysfunctions but also with numerous symptoms determined as a collective name Cerebellar Cognitive-Affective Syndrome (CCAS). This syndrome consists of cognitive and memory impairment, lingual deficits, personality changes and emotional disorders [11]. It is emphasized that emotional disorders are the most visible syndrome of CCAS [12]. The wide spectrum of disorders which may result from cerebellum damage derives from its multiple connections with other parts of the brain, including ones that take part in the affect control [13]. The so-called limbic cerebellum is also distinguished. It consists of the vermis of the cerebellum and fastigial nucleus which is described as cortical-limbic loop node in the dorsal anterior cingulate cortex and fronto-insular cortex [7]. These are the parts responsible for detection, integration and filtering emotional information [14], so the functions, whose disruption is also a basis of hoarding disorder.

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