Case Report

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A Case of Risperidone Induced Stuttering as a Paradox

İnci Meltem ATAY, Bilal TANRITANIR, Abdullah AKPINAR, Arif DEMİRDAŞ
Department of Psychiatry, Süleyman Demirel University Faculty of Medicine, Isparta, Turkey

ABSTRACT

The main feature of stuttering is the disturbance in terms of both timing and fluency of speech inappropriate with the age. This disturbance is characterized with the repetition and prolongation of sounds and syllables. There are two types of stuttering as acquired and developmental. Acquired stuttering may begin suddenly at any age and may be seen rarely due to the adverse effects of drugs. Stuttering induced by antipsychotics may develop very rarely. Risperidone is a strong antagonist of dopamin 2 (D_2) and serotonin 2A ($5\ HT_{2A}$) and shows a high affinity for α_1 and α_2 noradrenaline receptors. It's used in a wide spectrum including psychotic disorders, mood disorders, and behavioral disorders, even for the treatment of stuttering. Risperidone treats the symptoms of stuttering by the antagonism of D_2 receptors with an increase in striatal metabolism. In literature, we haven't observed any other case reports except the two stuttering cases with psychotic disorders due to the short term and high-dose risperidone treatment. In our case, stuttering adverse effect of chronic low-dose risperidone treatment is remarkable that is discussed for the first time. As well as the use of risperidone for the treatment of stuttering, stuttering adverse effect seems to be interesting as a paradox.

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Key words: Risperidone, stuttering, antipsychotics, adverse effects

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Introduction

Stuttering is defined as the disruption of speech in terms of both fluency and timing in a manner that is inappropriate for the age. This disruption is characterized with frequent repetitions and prolongation of the sounds and syllables. The other troubles include exclamations, word interruptions, hearable or silent blocks, indirect speech, stressing words with strain, and repetition of single-syllable words (1).

Stuttering has two types, including acquired and developmental stuttering. Developmental-type stuttering is observed more commonly, but it generally develops gradually during childhood or adolescence (2). The onset of developmental stuttering is generally observed between the ages of 2 and 7 years and shows an increase at approximately 4 years (3). Acquired stuttering may start suddenly at any age. Its reasons include disruption in brain functions, stroke, head trauma, brain tumor, and other conditions that affect the brain (2).

Rarely acquired stuttering may be observed in relation with the side-effects of drugs. Antipsychotic-induced stuttering occurs rarely. In the literature, cases of acquired stuttering related with antipsychotics, including chlorpromazine, trifluoperazine, levopromazine, olanzapine, clozapine, aripiprazole, and risperidone have been reported (4,5,6,7).

Risperidone is a strong antagonist of dopamine 2 (D2) and serotonin 2A (5 HT2A) receptors and acts by showing a high affinity for α1 and α2 receptors. It is used for treatment in a wide spectrum, including psychotic disorders, mood disorders, and behavioral disorders as well as stuttering (8).

In the literature, no case report has been found except for two cases of stuttering related with short-term high-dose risperidone used because of psychotic disorder. In our patient who had mental retardation, the side-effect of stuttering that was developed following the chronic use of low-dose risperidone was notable and discussed in detail for the first time.

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Correspondence Address
Dr. İnci Meltem Atay , Süleyman Demirel Üniversitesi Tıp Fakültesi, Psikiyatri Anabilim Dalı, Isparta, Türkiye
Phone: +90 246 212 20 00 E-mail: incimeltem@gmail.com **Received:** 06.12.2012 **Accepted:** 29.03.2013

Case

A 21-year-old single primary school graduate male patient was admitted to our outpatient clinic by his family with a complaint of stuttering. On interviewing the patient, it was found that the patient had moderate mental retardation because of perinatal asphyxia and consumed risperidone at a dose of 1 mg/day for 2 years with the diagnosis of behavioral disorder related with perinatal asphyxia. It was found that stuttering characterized with prolongation of sounds, hearable blocks, and repetitions of single-syllable words. No active psychopathology was found on psychiatric examination except for stuttering and mental retardation. Neurological examination was found to be normal. No side-effects related with the extrapyramidal system were found. There was no history of head trauma or any other pathology. There was no familial history of psychiatric disease. Cranial MRI examination revealed no pathology. It was observed that stuttering decreased to a minimal level at the follow-up visit after 17 days.

Discussion

Stuttering is a rare side-effect that may be observed in relation with the use of antipsychotics. Although there are many different causes in the etiology of acquired stuttering, it has been reported that the level of intelligence is far from being a determinative variable (9).

In one study, it was proposed that the high number of D2 receptors located in one part of the basal ganglion may be one of the genetic properties underlying stuttering (10). However, it was found that dopamine activity in individuals with stuttering was 50%–200% higher than that in the control group (11).

In the study by Wu et al. related with the etiology of stuttering, PET imaging showed that hypometabolism in the striatum arise from high dopamine (12).

Risperidone improves stuttering symptoms by increasing striatal metabolism by way of D2 receptor antagonism (13). However, the use of risperidone in the treatment of stuttering and the fact that stuttering occurs as the side-effect of risperidone is interesting as a paradox. In both cases of risperidone-induced stuttering reported in the literature, the use of high-dose risperidone because of psychotic disorder was observed. In the first of these cases, there was a history of transient stuttering during the adolescence period that lasted for 1 year and stuttering recurred on the 5th day of risperidone treatment that was started because of psychotic disorder (4). In the other case, stuttering occurred as a side-effect on the 11th day of risperidone treatment that was again started because of psychotic disorder. In these cases, risperidone was used at a dose of 4–8 mg/day, and the side-effect occurred during the early period (2).

In our patient, it was notable that the side-effect of stuttering occurred for the first time with the use of long-term (2 years) low dose (1 mg/day) risperidone in contrast to the side-effect of stuttering occurring in other cases. It is controversial whether this is related with changes, particularly in dopamine receptor levels, or whether this arises from awareness related with mental retardation or whether it is a side-effect related with the extrapyramidal system that easily occurs in individuals with mental retardation. Further large-scale studies directed to the etiology will be supportive in elucidating these different mechanisms.

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