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NICOTINE AND ALCOHOL DEPENDENCE IN SCHIZOPHRENIA

ŞİZOFRENİDE NİKOTİN VE ALKOL BAĞIMLILIĞI

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Abstract

Schizophrenia is a neurodevelopmental brain disease and a severe psychiatric disorder which is seen approximately in 1% of the society. About the half of the individuals diagnosed with schizophrenia have substance abuse story, and this rate is higher than the general population. Alcohol dependence, smoking and substance abuse has been reported very often in schizophrenia. Especially smoking rate is very high in patients with schizophrenia. The aim of this paper is to briefly review the literature related to the relationship between schizophrenia and nicotine-alcohol dependency.

Keywords: schizophrenia, nicotine, alcohol, abuse, addiction

Özet

Şizofreni toplumun yaklaşık %1'inde görülen ağır bir psikiyatrik bozukluk ve nörogelişimsel beyin hastalığıdır. Şizofreni tanısı alan bireylerin neredeyse yarısı madde kötüye kullanım bozukluğu öyküsüne sahiptir ve bu oran genel popülasyondan çok yüksektir. Alkol bağımlılığı, sigara içme ve madde kötüye kullanımının şizofreniye eşlik ettiği çok sık bildirilmiştir. Özellikle sigara içiminin şizofreni tanısı almış hastalarda çok yüksek oranda olduğu dikkati çekmektedir. Bu yazının amacı, şizofreni ile nikotin ve alkol bağımlılığı arasındaki ilişki ile ilgili literatürün kısaca gözden geçirilmesidir

Anahtar Kelimeler: şizofreni, nikotin, alkol, kötüye kullanım, bağımlılık

1. Introduction

Schizophrenia is a neurodevelopmental brain disease and a severe psychiatric disorder which is seen approximately in 1% of the society. This neurodevelopmental disorder's onset is at young ages with a peak of early 20's. The disease affects individual's thoughts, perception, mood and behaviors; it causes devastating psychopathological impacts in occupational, social and private life (Arslan et al., 2011).

Before 1960s, schizophrenia and substance abuse comorbidity has not been defined as a serious problem. Clinical interest in comorbidity of schizophrenia and substance abuse disorders has increased in the last two decades (Westermeyer, 1992; Mueser et al., 1998). Many studies suggest that the most common comorbidities in schizophrenia are substance abuse disorders (Ziedonis et al., 1994; Jimenez-Castro et al., 2010), and it is known that comorbidity worsens the prognosis and leads to negative symptomatic and functional consequences (Karakuş et al., 2012).

2. Epidemiology

In Epidemiologic Catchment Area Study (ECA) of American National Institute of Mental Health, it has been

demonstrated that 47% of patients with schizophrenia spectrum disorders has been diagnosed with substance abuse disorder (Verma et al., 2002). In this study, it has been found that the prevalence of substance abuse disorders in patients with schizophrenia is 4.6 times more than the substance abuse disorders in the general population. Alcohol is the mostly abused substance in both general population and patients with schizophrenia, and the second one is cannabis (Aras, 2013). Alcohol and cannabis were followed by benzodiazepines and cocaine (Mueser KT et al., 2000) and amphetamines (Cantor-Graae et al., 2001) in the list of abused substances. Additionally, in another study 58-90% of the patients with schizophrenia were reported to be nicotine addicts (Dalack GW et al., 1998).

A study in Canada revealed that 37% of patients with schizophrenia met the criteria of substance abuse or dependence, in 14% of the patients cannabis abuse was diagnosed (Addington J et al., 2001). In a study conducted in Germany with 232 patients with a diagnosis of schizophrenia, it was found that 13% of the patients had cannabis abuse (Hambrecht et al., 2000). In Sweden, 50.6% nicotine abuse, 47.1% alcohol abuse and 48.3% substance abuse was found in patients with schizophrenia (Cantor-Graae et al., 2001)

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Although the number of studies with Turkish population is limited, the research performed about comorbidity of schizophrenia and substance abuse has revealed that, comorbidity is not that much as mentioned in the literature. A study has reported that 50 of 100 patients with schizophrenia were neither drinking alcohol nor using any substance, 22 were reported to abuse only alcohol, 17 were alcohol and substance, and 11 were only substance abusers (Aras, 2013). The prevalence of smoking in schizophrenic population is 30-60% higher than the general population's prevalence (Akvardar et al., 2003). In Turkey, substance abuse both in the general population and patients with schizophrenia is lower than western countries. It may be due to religion, traditions or not reporting during surveys. Additionally in patients with schizophrenia, high rates of smoking and alcohol abuse, and low rates of other substances' abuse may be associated with accessibility of the substance.

According to the research on patients with schizophrenia, young male patients had higher comorbidity of substance abuse than elders and female patients (Jimanez-Castro et al., 2010; Dervaux et al., 2003). Male patients have two times more substance abuse disorder and four times more alcohol abuse disorder than women (Myers JK et al., 1984).

3. Etiology

The relationship between schizophrenia and substance use disorders is not clear yet. However, there are some assumptions in this regard. Patients with schizophrenia use substances that reduce symptoms of psychotic disorder, or that reduce the side effects of the medication used for treatment. This is called "self-medication" (Khantjian, 1990). Some patients were reporting that alcohol and other substances relieve symptoms such as social problems, insomnia, and depression (Brunette et al., 1997). Researchers suggest that patients with schizophrenia use substances to regulate negative emotions (Dilbaz et al., 2011). Another theory suggests that patients with schizophrenia develop addiction to certain substances in accordance with their neurobiological susceptibility. Dysfunction of mesocorticolimbic dopamine pathways underlying schizophrenia symptoms is also responsible for the dysfunction of brain's reward system in patients with substance abuse disorder. It is well known that abuse of the substances such as stimulants, hallucinogens and cannabis trigger psychotic disorders, suggesting a common neurobiological pathway (Krystal et al., 1999).

4. Schizophrenia and Smoking

Tobacco use has been only started to be seen as substance abuse in recent years because it does not affect productivity and does not arise any socially undesirable condition. As a result of research in 1988, it has been reported that nicotine is the substance in cigarettes that cause addiction, and has behavioral and pharmacological effects like in addiction of heroin or cocaine. In 1994, in the U.S. Congress, it has been declared as an addictive substance by the FDA.

As smoking in patients with schizophrenia was seen as part of the illness, it was overlooked by the clinicians (Schneier et al., 1987). Research in the U.S.A. has revealed that, in patients with schizophrenia, smoking rate is 58-90% which is 2.5-4.5 times higher than the general population (DeLeon J et al., 2005). In a study in Turkey, it was found that smoking prevalence in patients with schizophrenia was 57.5% while it was 47.3% in the healthy population (Üçok et al., 2001). In a study on patients with schizophrenia in 1994, it was found that smoking patients' negative symptoms were decreased, and positive symptoms were increased (Ziedonis et al., 1994).

Cigarette together with the various ingredients used in it and drugs interact pharmacokinetically and pharmacodynamically. Pharmacokinetic factors may be responsible for the patient's unresponsiveness or variable response to treatment (Preskorn, 2004). Polycyclic aromatic hydrocarbons in cigarette induce cytochrome P450 CYP1A1, CYP1A2, and most probably CYP2E1, CYP1A1 enzymes (Zevin et al., 1999) Polycyclic aromatic hydrocarbons in tobacco that induce CYP1A2 enzyme cause significant changes in the clozapine level (De Leon et al., 2003). The studies show that non-smoker patients' plasma clozapine levels were 3.2 times higher than the levels of smokers (Ozdemir et al., 2001).

5. Schizophrenia and Alcohol

The availability and legality of alcohol leads to widespread abuse among people with schizophrenia as well as in the general population. Alcohol is the most common substance of abuse, other than nicotine (Cuffel 1996). Alcohol abuse in patients with schizophrenia has been identified as 25-45% (Schneier et al., 1987). A study in Turkey revealed that the frequency of lifetime alcohol use in patients with schizophrenia is 63.3%, alcohol abuse and addiction rates are 8.1% (Dilbaz et al., 2011).

People with schizophrenia presumably use alcohol and other drugs for several similar reasons as others in community, but various factors have been hypothesized to contribute to this group's high percentages of substance use disorders (Drake et al 2000). Alcohol and other drugs might be used by the patients with schizophrenia to alleviate the symptoms of schizophrenia or the side effects of the antipsychotic medications prescribed for schizophrenia (Chambers et al. 2001). Research evidence does not fully confirm this opinion, however. For example, alcohol abuse often precedes schizophrenia and numerous substances of abuse exhibit a spectrum of different effects but generally exacerbates rather than reduce symptoms of schizophrenia (Chambers et al. 2001).

The underlying neuropathological abnormalities of schizophrenia may promote the positive reinforcing effects of substance use. A common neurological evidence for schizophrenia and the reinforcing impacts of substance use may predispose people to both conditions. This common basis involves the dysregulation of the dopamine (Koob and Roberts 1999). Another possible mechanism of the alcohol abuse in schizophrenia may be related to the weakened thinking, disturbed judgment and reduced impulse control which are common in schizophrenia.

Due to the trouble to balance benefit/ratio or difficulty of anticipating the risk, people with schizophrenia are especially vulnerable to the substance use. Thus, even when using relatively small amounts of psychoactive substances, these people are prone to exhibit notable substance-related behavioral problems that lead to a diagnosis of substance use disorder (Mueser et al. 1998).

A psychosocial mechanism that may drive to alcohol abuse in schizophrenia is the fact that many people with schizophrenia report that they use alcohol and other drugs to relieve the dysphoria of mental illness, poverty, limited opportunities, and boredom. Alcohol use reported to facilitate the development of a social network (Dixon et al. 1990).

Cross-sectional research point out that alcohol using disorders among people with schizophrenia is linked with various manifestations of adverse outcomes and poor quality of life such as relationship difficulties, increased risk of recurrence of psychiatric symptoms, psychosocial disturbance, cross-dependence of other substances, increased risk of legal and financial problems, medical problems such as HIV infection and hepatitis. (Drake and Brunette, 1998). One of the major reasons for the increased social problems in alcohol dependency in schizophrenia is the fact that alcohol use causes or exacerbates poor adjustment. A study of the outpatients with schizophrenia ascertained that those with co-occurring alcohol dependency had greater incidences of hospitalization and depression compared to those with schizophrenia only.

Conclusion

High rates of comorbid nicotine and alcohol abuse or dependency are observed in patients with schizophrenia. However, causes of substance abuse in patients with schizophrenia are not fully elucidated yet. This comorbidity is believed to affect the treatment process adversely, and the patients shall be in terms of substance abuse disorders in the treatment of schizophrenia.

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