

Schizophrenia and Oral Health - Review of the Literature

SUMMARY

Patients with schizophrenia, especially during period of their hospitalization, are likely to constitute a high-risk group of individuals with respect to prevalence of oral diseases. Several factors are mentioned in the manuscript that may contribute to the finding of increased prevalence of oral diseases in patients with schizophrenia. Unfortunately, some of these can be attributed to dental profession; these patients are sometimes deprived of dental service as they cannot afford the treatment due to its cost and they are even neglected sometimes by dental professionals. The idea of providing oral health care in the environment of specialized health care institutions, such as psychiatric hospitals, during periods of hospitalization, is especially emphasized.

Keywords: Schizophrenia; Oral Health Care; Caries; Periodontal Disease

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LITERATURE REVIEW (LR)

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Introduction

Mental health is an integral part of general health¹. However, it is considered that over 450 million people worldwide suffer from some form of psychiatric disorders², and schizophrenia is among the most frequent³⁻⁵. Psychiatric patients are often neglected by the society, probably because of ignorance, fear, stigma, misconceptions and negative attitudes. However, these persons are of even more concern for the society because there is a loss of productivity due to their disability and an increased health care cost, and burden to the government, their families, and society in general⁶.

Oral health is an integral part of health care⁷. Psychiatric patients, especially during period of their hospitalization, are likely to constitute a high-risk group of individuals with respect to prevalence of oral diseases and may require special attention⁸. Factors such as the nature of psychiatric disorders, length of stay and oral-side effects of psychotropic drugs have been noted as contributors to poor oral health among institutionalized chronic psychiatric patients⁹. In addition, unhealthy behaviours, such as smoking cigarettes, alcohol consumption and illicit drug use have been linked to psychiatric disorders¹⁰.

Oral health is especially influenced by caries and periodontal disease⁷. Caries is multi-causal infectious

disease directly dependent on nutrition. It is the end result of complex mutual impact of tri main factors: the host (characteristics of tooth enamel and saliva), the cause (oral biofilm), and the environment (food and dietary habits)¹¹. Periodontal disease is a complex disorder of all periodontal tissues (gingiva, alveolar bone, periodontium and dental cement), and it is irreversible if affects all the periodontal tissues⁷. The mutual causal factor of both, caries and periodontal disease, is dental plaque¹²⁻¹⁴, and the end result of both is tooth loss⁷.

Recent studies, done elsewhere, pointed to the increased prevalence of caries and periodontal disease in psychiatric patients compared to mentally healthy individuals^{3,4,6,15-30}. There are several reasons for this finding^{20,25}: (1) the primary illness lessens motivation for oral care, sometimes even reducing capability for use the adequate technique of tooth-brushing; (2) some antipsychotics have oral side-effects, such as xerostomia; (3) possibilities for regular dental visits are reduced; and (4) dentists are not especially trained to take care of this category of patients.

The aim of this report is to review already published data on psychiatric patients, especially those with schizophrenia, and to evaluate problems with their oral health care, pointing to possible solutions of improving it.

Schizophrenia

Schizophrenia is a chronic mental disorder with exacerbations and remissions, characterized by disintegration of thought processes and of emotional responsiveness, which leads to social and occupational disability of patients. Therefore, it is a burden for both, the patient's family and the community, and it is the disease of great public health importance. The World Health Organization (WHO) designated schizophrenia as one of the 10 most common diseases that contribute to the overall burden of world population³¹.

Epidemiology of Schizophrenia

Schizophrenia is a relatively common psychotic disorder³². Epidemiological studies show that prevalence of schizophrenia is approximately the same in all parts of the world³³. It occurs in 1% of general population and is one of the leading causes of disability in people between 15 and 44 years of age, which means at a time when the greatest personal development and individual productivity is expected³¹. The annual incidence of schizophrenia ranges from 0.16 to 0.28 per 1 000 inhabitants. The prevalence is 4 000 to 5 000 per million, or about 1.1% for men and 1.9% for women³⁴. The prevalence, morbidity and severity of clinical symptoms were higher in urban and industrialized areas compared to rurals^{33,35}. Also, the prevalence is higher in lower socio-economic levels, but the incidence is equal in all socio-economic classes³⁵. However, the incidence of the disease is higher among single people, which can be a result of the disease or illness precursors to social functioning³³.

It is believed that because of chronic course of the disease nearly half of patients in mental hospitals are from category of schizophrenia³⁶. Until thirty years ago, about 50% of the total bed fond in psychiatric institutions of the Republic of Serbia belonged to the people suffering from schizophrenia. Today that number is half lower, but is still quite high despite the use of modern methods of treatment³⁴. Data on hospital morbidity in the Republic of Serbia, in the period from 2007 to 2011, show that the number of hospitalized patients only diagnosed with schizophrenia increased from 4 434 in 2007 to 5 152 in 2011 (16%)³¹.

Aetiology of Schizophrenia

Potential causes of schizophrenia are not sufficiently clear and there is no a single cause, but it seems that schizophrenia is the result of a complex interaction of genetic, biological, psychological and social factors³¹. Studies of schizophrenia aetiology are focused on neurobiological processes, considering a change in gene expression, neuro-immunological background or toxic brain damage (prenatal and postnatal)³⁷. However, there is no convincing evidence of any specific theory

of schizophrenia aetiology, probably because of the heterogeneity of the disease³⁸.

Clinical Characteristics of Schizophrenia

Schizophrenia is usually manifested through 2 clinical entities: acute and chronic syndrome. Acute syndrome is basically a syndrome with clinical features that are related to positive symptoms of schizophrenia, and which include: hallucinations, delusions of persecution, social deprivation, degradation of operation efficiency and misinterpretation of social relationships (delusion). However, occasionally schizophrenic syndrome is characterized by phenomena called negative symptoms, and they include: inactivity, social withdrawal, lack of energy, impaired thinking and emotional numbness (apathy)³⁴. One of 10 patients with schizophrenia commits and every third attempts suicide. The life expectancy of a person with schizophrenia is significantly shorter than in the general population³¹.

Classification of Schizophrenia

In recent decades, pathognomonic signs and symptoms were systematized in precise diagnostic criteria for the classification of diseases, which are currently valid through 10th Revision of the International Classification of Diseases (ICD-10)³⁹ and the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (DSM-IV)⁴⁰.

Under the current ICD-10, schizophrenia is marked as F20, it's different clinical forms (F20.0 - F20.9) being as follow: paranoid schizophrenia, hebephrenic schizophrenia, catatonic schizophrenia, undifferentiated schizophrenia, post-schizophrenic depression, residual schizophrenia, simple schizophrenia, and other unspecified schizophrenia³⁹.

Treatment of Schizophrenia

The main objectives of the treatment of schizophrenia are to reduce the number, duration and severity of episodes of the disorder, to reduce overall morbidity and mortality, and to improve social functioning, independence and quality of life to a greater extent. The therapeutic plan is formulated after the initial assessment. The goals and strategies in the treatment depend on the stage of the disorder and its severity³¹.

Once the diagnosis of schizophrenia has been made, or just suspicion of it, it is necessary to hospitalize the patient till additional clinical studies confirm the diagnosis. Hospitalization should also be implemented if the disease worsens or similar signs appear (strong psychomotor anxiety, aggressive behaviour, side-effects of medication, suicidal tendencies etc.)³⁴.

Today, schizophrenia is mainly treated by antipsychotics. The essence of the efficacy of antipsychotics is based on their antagonistic effect at dopaminergic receptors, both postsynaptic and

presynaptic³⁴. There are many antipsychotic drugs, which are divided into antipsychotics of first and second generation. This division was based on the presence or absence of extrapyramidal symptoms, but also on other aspects of drugs (receptor profile, neurophysiological effects, therapeutic profile and the profile of adverse effects). Serbia has registered a large number of first-generation antipsychotics, such as chlorpromazine, fluphenazine, haloperidol, levomepromazine, sulpiride and zuclopenthixol. Drugs of this generation have a high affinity to dopamine D₂ receptors, and consequently all lead to extrapyramidal symptoms and have a significant risk of tardive dyskinesia. Some are effective in the treatment of positive psychotic symptoms, whereas their efficiency in the treatment of negative symptoms is less pronounced. As far as the second-generation antipsychotics are concerned, in Serbia are registered clozapine, risperidone, olanzapine, sertindole, quetiapine, ziprasidone, amisulpride and paliperidone³¹. After application of these antipsychotics neurotransmitter activity is better balanced, as they do not act only on dopaminergic D₂ receptor system³⁴.

Unfortunately, in addition to their positive therapeutic effects, antipsychotics cause a range of side-effects. It is assumed that the blockade of the mesolimbic dopaminergic receptors road is important for antipsychotic effect, while blockade of nigrostriatal dopaminergic receptors is responsible for extrapyramidal manifestations. In the second-generation of antipsychotics, mechanism of action is associated with high affinity for serotonin 2a receptor antagonist and modulation of dopaminergic activity³⁴.

Apart from antipsychotics, patients with schizophrenia are given other groups of drugs in order to eliminate or minimize the side-effects of antipsychotics. The use of antidepressants in the treatment of schizophrenia is particularly suitable when there are severe depressive, even catatonic symptoms. If the level of anxiety is high, anxiolytics (benzodiazepines) should be added³⁴.

Among the adverse effects to antipsychotics, particularly interesting is possible pharmacological Parkinsonism, which is accompanied by muscle rigor, dyskinesia and vegetative disturbances. In the case of the aforementioned effects, drugs of choice are antiparkinsonian drugs. Also, people with schizophrenia often have sleep disorders in the form of insomnia; therefore, if necessary, hypnotics and sedatives might be introduced³⁴.

Oral Health and Schizophrenia

Oral health has a significant part in the mental health⁴¹. Oral health is a reflection of the general health,

because medications, unhealthy habits and diet can affect it. Also, there is a clear link between oral health and quality of life, because oral health affects diet, speech, self-esteem and emotional condition⁴². Thus, oral health should not be separated from mental health⁴¹.

Local diseases that have the greatest impact on oral health are caries and periodontal disease⁷. As previously said, caries and periodontal disease have a common major aetiological factor, and that is dental plaque¹²⁻¹⁴. Dental plaque is described as organic, bacterial, colourless and opalescent soft plaque that accumulates on the teeth, but also in other places in the oral cavity in the form of biofilm⁴³. Concerning pathogenic mechanism of caries, bacteria use complex carbohydrates from dental plaque for their own metabolism, and as a final product the obtained acids increase pH in the oral cavity. In this environment the process of demineralization overcomes the remineralization process, which leads to a distortion of the mineral component of enamel (ions Ca₂⁺ and PO₄³⁻ diffuse from the tooth enamel), and this leads to cavitation, causing initial carious lesion⁴⁴. Concerning pathogenesis of periodontal disease, microorganisms destroy a collagen fibres, which leads to apical migration of the attached epithelium and deepens the gingival sulcus to form periodontal pocket⁴⁵. The final stage of both oral diseases (dental caries and periodontal disease) is the loss of the tooth⁷.

Psychiatrically ill persons being hospitalized in psychiatric institutions for a long period of time express an increased prevalence of oral diseases^{4,5,17,29,46-53}. It is reasonable to say that psychiatric patients who were hospitalized for a long time represent a high-risk group for the development of oral diseases comparing to mentally healthy persons⁴⁷. In addition, negative symptoms of the underlying disease (schizophrenia), such as apathy or inability for initiation and maintaining behaviour that is objective-driven, contribute to inadequate oral health status because they reduce ability and motivation of patients to maintain oral hygiene⁵⁴. Moreover, cognitive defects in people with schizophrenia, like poor memory and decrease of attention, reduce their ability to recognize problems of their own oral health and needs for regular and proper oral hygiene practice⁵⁵.

Drugs used to treat psychiatric disorders can contribute to negative effects in the oral cavity, such as xerostomia, which leads to the progression of periodontal disease and increased destruction of teeth^{56,57}. Psychotropic drugs, in particular, can cause hypofunction of salivary glands⁵⁸ and formed hypo-salivation, which consequently reduces self-cleaning activity of the oral cavity, leading to an increased accumulation of dental plaque on marginal gingival area⁴³. As schizophrenia is predominantly a chronic disease, drug therapy takes a long period of time, so the probability of negative impact on oral health is consequently bigger⁵⁵. Studies have shown that psychiatric patients usually take a large

number of psychiatric drugs^{3,5,20,46,59,60}. It is of special interest that certain drugs reduce salivation, in other words cause xerostomia, which is confirmed by numerous studies⁶¹⁻⁶³. This effect is especially provoked by drugs belonging to the first generation of antipsychotics⁶⁴⁻⁶⁵, antiparkinsonian drugs and benzodiazepines⁶⁶. In order to reduce the subjective symptom of xerostomia, people increasingly use chewing gums, but they also consume sweets and beverages with a high concentration of carbohydrates^{54,67}, directly increasing the prevalence of oral diseases^{17,27}.

Dental treatment of psychiatric patients is not an easy task, primarily because they avoid regular visits to dental offices and neglect maintaining adequate oral hygiene. Even more, psychiatric patients are often incapable to establish true cooperation, scared of dental interventions and have financial hardship^{68,69}. In most trials, psychiatric patients last visited a dentist for more than one year previously^{17,46,59,68,70,71}, and the main quoted reason was fear of dental interventions^{17,71}. When it comes to oral hygiene of psychiatric patients, most studies point out that they irregularly maintain oral hygiene during hospitalization^{4,6,17,19,27,46,48,59,60,71,72}, not apply proper brushing technique^{27,59}, and do not usually have oral hygiene aids⁶⁸.

Psychosocial factors and stress are associated with the progression of periodontal disease. A significant correlation between some psychosocial factors and chronic periodontal disease was found. Psychosocial factors, stress at work, depression, unemployment or negative life events are well known risk factors for periodontal destruction⁷³. There are several possible explanations of the role of stress in the pathogenesis of periodontal disease; for example, stress causes depression of the immune response by cortisol release, which provides an opportunity for bacteria to invade tissue⁷³; stress may cause activation of autonomic nervous system and secretion of adrenaline and noradrenaline, which in turn trigger prostaglandins, who mediate periodontal tissue destruction. In addition, stress can cause adverse changes in behaviour and developing of bad habits, such as smoking, neglecting oral hygiene and irregular visits to the dentist, what would be the indirect role of stress⁷³.

Numerous studies have shown a clear connection between smoking and periodontal disease. Bad habits such as cigarette smoking and alcohol consumption not only increase the incidence of periodontal disease, but increase the risk of oral cancer as well^{74,75}. It has been shown that the risk for periodontal disease is growing from 2.5 to 7 times in smokers compared to non-smokers⁷³. Smokers have a more severe form of the disease and less successful response to conservative and surgical periodontal therapy. However, smokers are clinically less prone to gingival inflammation and bleeding. This can be explained by vasoconstriction caused by nicotine, which reduces blood flow, oedema

and clinical signs of inflammation⁷³. Previous studies of psychiatric patients' oral health have shown that persons suffering from psychiatric illness smoke cigarettes more often and in greater extent comparing to mentally healthy persons^{17,59,68,76,77}. Moreover, schizophrenic patients often consume alcohol⁷⁸, which increases number of their hospitalizations and severity of symptoms of the underlying (psychiatric) disease^{80,81}. On the other hand, alcohol abuse can "mask" symptoms of the psychotic illness up to several years a fact that unnecessarily postpones the beginning of therapy^{82,83}. Studies on oral health of alcohol abusers showed greater incidence of caries⁸⁴ and periodontal disease⁸⁵ compared to persons not consuming alcohol.

Studies also show an increased representation of narcotics' abuse among hospitalized psychiatric patients^{86,87}, including schizophrenic patients as well^{88,89}. Moreover, there are numerous studies showing that cannabis use may be one of the causes of schizophrenia^{90,91}. In the United States, over 50% of schizophrenic patients are addicted to cocaine, and 40% of them are addicted to cannabis⁹². Finally, it is interesting that previous studies show an increased prevalence of periodontal disease in individuals who enjoy narcotics, such as cocaine and ecstasy^{93,94}.

It is known that there is a close connection between the general health of the organism and the health of oral mucosa, which is especially evident in cases of psychosomatic disorders and psychiatric illness, which include schizophrenia. In the oral cavity of these patients, in addition to tooth decay and periodontal disease, several other changes may occur, such as: the ulcer-necrotic gingivitis, recurrent oral ulcers, lichen planus, geographic tongue, secondary infections, as well as changes that accompany the side-effects of drugs⁹⁵. In schizophrenic patients a self-injury of oral soft tissues can sometimes be noticed, as well as attrition or abrasion of teeth (due to manic behaviour), temporomandibular joint dysfunction, bruxism, hyper-salivation, chronic oro-facial pain syndrome, infections of oral tissues and other^{3,6,18,76,95,96}. All this strengthens the need for much better dental health control of persons with psychiatric diseases, including schizophrenia. This could be achieved in the society, but even more in the environment of specialized health care institutions, such as psychiatric hospitals.

Conclusion

Many studies established that oral diseases, especially caries and periodontal disease, are much more prevalent in patients with schizophrenia than in healthy individuals. Factors such as the nature of psychiatric disorders, length of hospital treatment and oral-side effects of psychotropic drugs may considerably contribute

to poor oral health among patients with schizophrenia. That is why oral health care is especially important for this category of psychiatric patients.

However, dental treatment of patients with schizophrenia is not an easy task, primarily because they avoid regular visits to dental offices and neglect maintaining adequate oral hygiene. There are several factors that contribute to the finding of increased prevalence of oral diseases in patients with schizophrenia. Unfortunately, some of these can be attribute to dental profession; these patients are sometimes deprived of dental service because they cannot afford the treatment due to its cost and they are even neglected, sometimes, by dental professionals. It is an impression that oral health care could especially easily be done during periods of hospitalization, in the environment of specialized health care institutions, such as psychiatric hospitals.

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