

ORIGINAL ARTICLE

Prevalence of Gingival Inflammation among Patients Taking Antipsychotic DrugsAYESHA RAFIQUE¹, MUHAMMAD IFTIKHAR AHSEN², MUHAMMAD USMAN KHATTAK³, MUHAMMAD YOUSAF ALI⁴, SITTARA JAVED⁵, QASIM KHALID⁶¹General Dentist,²Senior Registrar, Department of Periodontology, University College of Dentistry, The University of Lahore³Assistant Professor, Department of Periodontology, Riphah International University⁴Assistant Professor, Department of Periodontology, Lahore Medical and Dental College Lahore⁵Post-graduate resident, Fatima Memorial Hospital, Lahore⁶Senior Registrar, Avicenna Medical and Dental College, LahoreCorresponding author: Muhammad Iftikhar Ahsen, Email: doc.iahsen@gmail.com**ABSTRACT****Objective:** To explore the prevalence and severity of gingival inflammation among the patients taking antipsychotic drugs.**Method:** This cross-sectional study was conducted in OPD of a psychiatric department of a tertiary care hospital in Lahore, Pakistan. Sample of 1025 patients was taken with the history of antipsychotic drugs. Patients were examined for the prevalence and severity of gingival inflammation and periodontal disease using modified gingival index (MGI) and basic periodontal examination (BPE). Study was conducted from March to August 2022. Data will be entered in SPSS version 25.0. Descriptive statistics, i.e. frequency and percentage were calculated for categorical data.**Results:** A total number 1025 patients with history of antipsychotic drugs were examined, 873 of them had some degree of gingival inflammation. Out of 873 patients with gingival disease, 536 (61.39%) patients exhibited mild to moderate inflammation whereas periodontal status of 337 (38.60%) patients presented severe inflammation. Basic periodontal examination was performed on individuals exhibiting severe gingival inflammation and patients were guided regarding further treatment that was needed to improve periodontal health.**Conclusion:** The findings of current study revealed that patients who are on anti-psychotic drugs are at higher risk of developing gingival diseases due to reduced salivary flow and need advanced treatment for their periodontal condition.**Keywords:** Psychosis, gingival diseases, Dental caries, Self-esteem**INTRODUCTION**

Oral health is considered a major aspect of overall quality of life, self-esteem and general physical health.^{1,2} Principle functioning of mouth becomes affected due to the poor oral health caused by periodontal / gingival disease as well as dental caries.² There is plenty of evidence in the literature that psychotic patients have higher susceptibility to tooth decay, missing teeth and filled teeth³ which need proper dental treatment,⁴ as psychotic patients have low compliance towards oral health maintenance,⁵ and the adverse effects of antipsychotic medications also play a role.⁶ The adverse effect seen with the use of antipsychotic medications is xerostomia i.e. decreased salivary flow rate, that results in increased incidence of dental caries, glossitis, periodontal disease, and stomatitis. Consequently, the patients have a higher need for dental treatments like tooth extraction and restorations.^{2,7,8}

Saliva plays a vital role in the prevention of periodontal disease by the virtue of its properties. The action of shear forces associated with salivary flow is important for prevention of dental and periodontal tissue from pathogenic flora. Saliva also contains different molecular components that help the host defense against bacterial colonization and periodontal disease. Antibodies (IgA) are also present in saliva that inhibit bacterial adherence and promote agglutination. Table 1

The need of the hour is to realize the effect of antipsychotic drugs in such patients. Till now, very little literature is available which evaluated the severity and prevalence of gingival inflammation among patients with antipsychotic medications.⁹⁻¹²

Periodontitis is a chronic multifactorial inflammatory disease associated with dysbiotic plaque biofilms and characterized by progressive destruction of the tooth-supporting apparatus.¹³ Progression of disease results in destruction of periodontal attachment, along with the supporting bone, which results in tooth mobility and finally tooth loss in severe cases.¹³ Loss of periodontal attachment is an irreversible damage which leads to loss of tooth if not treated timely.¹³

The quality of life of patients with periodontal disease always remain compromised in terms of aesthetics as well as function which in the longer run adversely affects the self-esteem and well-being of the patients.¹⁴ It is also evident that periodontal and gingival diseases are associated with the risk for systemic

diseases such as cardiovascular accidents and uncontrolled diabetes.^{15,16,17,18}

The Modified Gingival Index (MGI) is based on the visual scale to evaluate health of gingiva in terms of changes appear on the basis of inflammation severity.¹⁹

The BPE is a simple and rapid screening tool that is used to for further examination needed and provides basic guidance on treatment needed. These BPE guidelines are not descriptive but represent a minimum standard of care needed for improvement and maintenance of oral health.

In Pakistan, no study has been cited which explored the prevalence of periodontal disease among the patients taking antipsychotic drugs. So, this study was planned to fill this gap in literature which will be helpful for dentists, psychiatrist and general population who are associated with the patients of psychosis. Therefore, the objective of this study was to explore the prevalence and severity of periodontal disease among the patients of psychosis that are on medications.

Table 1: Salivary components and their functions

Components of Saliva	Functions
Antibodies (IGA)	Inhibits bacterial adherence and promotes agglutination
Lactoferrin	Stops bacterial growth
Hystatin	Neutralizes lipopolysaccharides
Cystatin	Inhibits bacterial growth
Mucin	Inhibits bacterial adherence and promotes agglutination

METHOD

This cross-sectional study was conducted in OPD of a psychiatric department of a tertiary care hospital in Lahore, Pakistan. Sample of 1025 patients was examined for the prevalence of gingival diseases with the history of antipsychotic drugs. Among this sample, 873 patients were found to have gingival inflammation of varying severity. Study was conducted from March to August 2022. Patients who were taking anti-psychotics were included in the study. Modified gingival index was recorded for patients who gave consent to be a part of this study, gingiva was visually examined

for inflammatory changes, MGI classifies the gingival inflammation on the basis of score given in table 2.

MGI classifies the gingival inflammation into 4 basic categories i.e. normal, mild inflammation, moderate inflammation and severe inflammation

Basic periodontal examination was performed on patients exhibiting severe gingival inflammation as evaluated by MGI to screen the patients in need of further detailed periodontal examination and assess the type of treatment needed. Oral hygiene instructions were given to the patients and were further guided regarding effects of compromised oral hygiene and poor periodontal health on other aspects of general physical health. Age of participants ranged between 25 years to 55 years which was categorized in 2 groups. Group 1 consisted of participants with age ranged between 25 years to 38 years and group 2 consisted of participants with age ranged between 39 to 55 years. Data will be entered in SPSS version 25.0. Descriptive statistics, i.e., frequency and percentage were calculated for categorical data.

Table 2: MGI classification

Score	Inflammation	Appearance	Volume	Extent
0	Normal	No abnormality	None	None
1	Mild	Slight change in color and texture but not entire marginal or papillary gingival unit	Slight edema of the margin	Part of the gingival unit
2	Mild	Slight change in color and texture involving entire marginal or papillary gingival unit	Slight edema of the margin	Entire gingival unit
3	Moderate	Glazing redness and edema of entire gingival or papillary unit	Edema and/or enlargement of the margins	Entire gingival unit
4	Severe	Glazing redness and edema or enlargement of entire gingival or papillary unit spontaneous bleeding and ulceration	Edema and/or enlargement of the entire gingival unit	Entire gingival unit

RESULTS

Total number of patients examined with history of antipsychotic drugs were 1025 patients, out of which 873 patients were had some degree of gingival inflammation in their oral cavity.

Table 3: Incidence of periodontal disease in patients with history of antipsychotic drugs

Total Patients Examined	With Gingival Inflammation	Without Gingival Inflammation
1025	873	152

In 873 patients, female patients were 63.48% and male participants were 36.52%

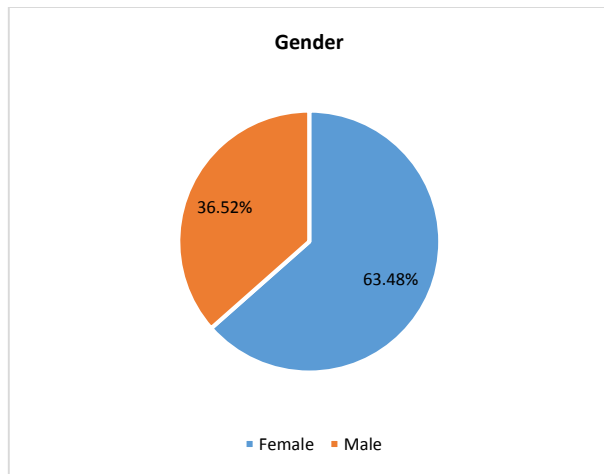
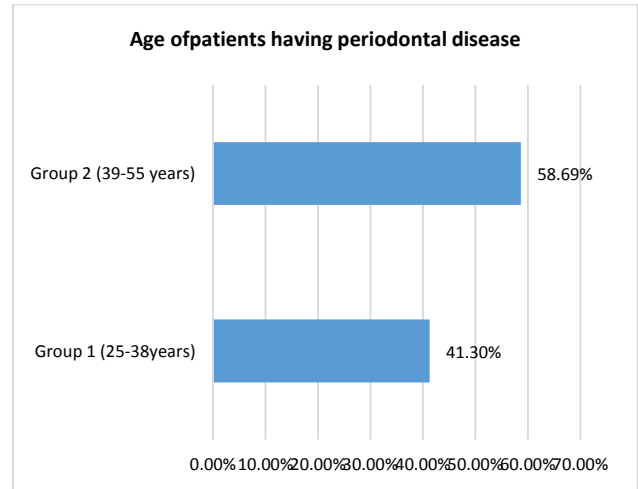


Figure 1: Gender wise data distribution

From entire data of 873 patients of drug history, patients in age group 1 were 41.304% and in age group 2, total patients were 58.69%



Graph 2: Age wise data distribution

In entire data of 873 patients with periodontal disease, periodontal status of 61.39% patients falls between mild to moderate range whereas periodontal status of 38.60% patients falls under severe category.

Table 4: Severity status of periodontal disease

	Mild to Moderate gingival inflammation	Severe gingival inflammation
Patients with history of Drug and inflammation	61.39 %	38.60 %

DISCUSSION

The findings of current study revealed that the prevalence of gingival inflammation was significantly higher in patients taking antipsychotic medications. There was variation in the prevalence of gingival inflammation among different age groups and gender, gingival inflammation was more prevalent in females as compared to males which is in line with the findings of previous studies and prevalence was more in older age groups.^{18,19,20,21}

The findings of current study, the prevalence of gingival disease among patients taking antipsychotic drugs was 85.17% which is low as compared the findings of a survey-based study conducted in Taiwan according to which 90% of the psychotic patients had gingival inflammation.²⁰ A similar study conducted in Hong Kong reported that the prevalence of gingival disease among psychotic patients was 98.5%. In current study, severe gingival inflammation was found among 38.60% of the patients while 61.39 % percent of the patients had mild to moderate level of disease.²¹ From the findings of the study, it could be concluded that early use of preventive measures can help in preventing the occurrence of gingival disease, periodontal disease, caries and eventually tooth loss in such patients. Very little data is present on this subject as majority of the international researches have been done on limited data,^{19,20,23,24} whereas no research has been cited that is conducted in Pakistan.

A study conducted on the antipsychotic drugs which plays part in accelerating the periodontal disease among the patients of psychosis revealed that FGAs, anti-hypertensives, anticholinergics, and SGAs, all are contributing to the development of periodontal disease among patients of psychosis.²⁵ Hence, it is important to prescribe lowest possible dose of antipsychotics and other medications as a preventive measure of developing periodontal disease. Patients may further be guided while starting their treatment with antipsychotic drugs to visit their dentists regularly

and inform the dentist regarding the medications to keep the oral cavity and periodontium in optimum state. Many research findings reported xerostomia which is the outcome of taking anti-psychotics, as an increased risk for developing periodontal disease.^{23,26,27} The findings of current study revealed that patients who are on anti-psychotic drugs are at higher risk of developing periodontal disease due to low salivary flow rate.

REFERENCES

- Department Of Health. Choosing better oral health: an oral health plan for England. 2005. Epub 19 November 2021. <https://www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention>. Accessed August 28, 2022.
- Cormac I, Jenkins P. Understanding the importance of Oral health in psychiatric patients. *Adv Psychiatr Treat*. 1999;5(1):53-60.
- Yang M, Chen P, He MX, et al. Poor oral health in patients with schizophrenia: a systematic review and meta-analysis. *Schizophr Res*. 2018;1(201):3-9.
- Report of the British Society for Disability and oral Health Working Group. Report of the British Society for Disability and oral Health Working Group. 2000. <http://www.bsdh.org/documents/mental.pdf> Accessed August 28, 2022.
- Turner E, Berry K, Aggarwal VR, Quinlivan L, Villanueva T, Palmier-Claus J. Oral health self-care behaviours in serious mental illness: a systematic review and meta-analysis. *Acta Psychiatr Scand*. 2022;145(1):29-41.
- Kilbourne A, Horvitz-Lennon M, Post E, et al. Oral health in veterans affairs patients diagnosed with serious mental illness. *J Public Health Dent*. 2007;67(1):42-48.
- Palmier-Claus JE, Shiers D, French P, Harris R, Laverty L. Oral health in psychosis: an unmet need. *Schizophr Res*. 2019;1(204):442.
- Mirza I. Oral health of psychiatric in-patients: a point prevalence survey of an inner-city hospital. *Psychiatri bull*. 2001;25(4):143-145.
- Eltas A, Kartalci S, Eltas SD, Dündar S, Uslu MO. An assessment of periodontal health in patients with schizophrenia and taking antipsychotic medication. *Int J Dent Hyg*. 2013;11(2):78-83.
- Friedlander A, Marder S. The psychopathology, medical management and dental implications of schizophrenia. *J Am Dent Assoc*. 2002;133(5):603-610.
- Matevosyan N. Oral health of adults with serious mental illnesses: a review. *Community Ment Health J*. 2010;46(6):553-562.
- McCreadie R, Stevens H, Henderson J, et al. The dental health of people with schizophrenia. *Acta Psychiatr Scand*. 2004;110(4):306-310.
- Papapanou PN, Sanz M, Buduneli N, et al. Periodontitis: consensus report of workgroup 2 of the 2017 world workshop on the classification of periodontal and peri-implant diseases and conditions. *J Clin Periodontol*. 2018;45(Suppl 20):S162-S170.
- Ferreira MC, Dias-Pereira AC, Branco-de-Almeida LS, Martins CC, Paiva SM. Impact of periodontal disease on quality of life: a systematic review. *J Periodontol Res*. 2017;52(4):651-665.
- Nascimento GG, Leite FRM, Vestergaard P, Scheutz F, López R. Does diabetes increase the risk of periodontitis? A systematic review and meta-regression analysis of longitudinal prospective studies. *Acta Diabetol*. 2018 Jul;55(7):653-667.
- Larvin H, Kang J, Aggarwal VR, Pavitt S, Wu J. Risk of incident cardiovascular disease in people with periodontal disease: a systematic review and meta-analysis. *Clin Exp Dent Res*. 2021;7:109-122.
- Johns LC, Van Os J. The continuity of psychotic experiences in the general population. *Clin Psychol Rev*. 2001;21(8):1125-1141.
- Arnaiz A, Zumárraga M, Díez-Altuna I, Uriarte JJ, Moro J, Pérez-Ansorena MA. Oral health and the symptoms of schizophrenia. *Psychiatry Research*, 2011;188, 24–28.
- Lobene RR, Weatherford T, Ross NM, Lamm RA, Menaker L. A modified gingival index for use in clinical trials. *Clin Prev Dent*. 1986 Jan-Feb;8(1):3-6. PMID: 3485495.
- Gurbuz O, Alatas G, Kurt E, Dogan F, Issever H. Periodontal health and treatment needs among hospitalized chronic psychiatric patients in Istanbul, Turkey. *Community Dental Health Journal*, 2011; 28, 69–74.
- Teng PR, Su JM, Chang WH, Lai TJ. Oral health of psychiatric inpatients: a survey of central Taiwan hospitals. *General Hospital Psychiatry*, 2011;33, 253–259.
- Tang WK, Sun FC, Unqvist GS, O'Donnell D. Oral health of psychiatric in-patients in Hong Kong. *International Journal of Social Psychiatry*, 2004;50, 186–191
- Hu K-F, Ho P-S, Chou Y-H, Tsai J-H, Lin C-HR, Chuang H-Y. Periodontal disease and effects of antipsychotic medications in patients newly diagnosed with schizophrenia: a population based retrospective cohort. *Epidemiology and Psychiatric Sciences* 2020; 29, e49, 1–8. <https://doi.org/10.1017/S204579601900043X>
- Gopalakrishnapillai AC, Iyer RR, Kalantharakath T. Prevalence of periodontal disease among inpatients in a psychiatric hospital in India. *Special Care in Dentistry*, 2012; 32, 196–204.
- Eltas A, Kartalci S, Eltas SD, Dündar S, Uslu MO. An assessment of periodontal health in patients with schizophrenia and taking antipsychotic medication. *International Journal of Dental Hygiene* 2013; 11, 78–83.
- Kang J, Palmier-Claus J, Wu J, Shiers D, Larvin H, Doran T, et al. Periodontal disease in people with a history of psychosis: Results from the UK Biobank population-based study. *Community Dentistry and Oral Epidemiology*. 2022;00, 1-12. DOI: 10.1111/cdoe.12798
- Mizutani S, Ekuni D, Tomofuji T, Azuma T, Kataoka K, Yamane M, Iwasaki Y, Morita M. Relationship between xerostomia and gingival condition in young adults. *Journal of Periodontal Research*, 2015; 50, 74–79.