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Original Article

Assessment of Periodontal Health in Patients with Sickle Cell Disease (SCD)

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***ABSTRACT*:**
Background: Sickle cell disease (SCD) is an inherited disease in individuals homozygous for hemoglobin S. Numerous oral manifestations of SCD that affect the oral mucosa, gingival tissue, mandible, nerve supply, and tooth enamel and pulp have been reported. **Aim of the study:** To assess the periodontal health in patients with sickle cell disease. **Materials and methods:** The study was conducted in the Department of Periodontics of the dental institution. A total of 30 patients with SCD from the medical hospital were included in the study group. Study group comprised of sickle cell disease patients of both sex and varying age groups. A control group of 20 patients matched for age and sex was also included. Study was conducted for a period of one year. **Results:** The number of male patients was 14 and he number of female patients was 16.The mean plaque index in sickle cell disease group was 3.11±1.16 and in control group was 2.1±0.89. The mean gingival index of sickle cell disease group was 2.75±1.77 and in control group was 1.82 ± 0.87. **Conclusion:** The periodontal diseases are very prevalent in patients with sickle cell disease. Thus, preventive dental care is very important for SCD patients.
Keywords: Sickle cell disease, Plaque, periodontal ligament.

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INTRODUCTION:

Sickle cell disease (SCD) is an inherited disease in individuals homozygous for hemoglobin S. Previous studies have shown clinical alterations in the oral mucosa and dental mineralized tissues and delayed tooth eruption, a high prevalence of dental caries, poor occlusion, and pulpal necrosis in healthy teeth in patients with SCD.[1, 2] However, some studies have reported conflicting results as to the prevalence of caries and periodontal diseases. Sickle-cell disease is particularly common among people whose ancestors come from sub-Saharan Africa, India, Saudi Arabia and Mediterranean countries.A main feature of SCD is vaso-occlusive crisis of the microcirculation, which leads to limited blood supply to tissues and tissue necrosis.[3,4] Patients with SCD usually report subjective pain in the form of acute pain crisis, which is considered to be one of the earliest clinical manifestations of this disease. Bone marrow hyperplasia and osteomyelitis of the jaw are general manifestations of SCD. Numerous oral manifestations of SCD that affect the oral mucosa, gingival tissue, mandible, nerve supply, and tooth enamel and pulp have been reported.[5,6] Hence, we planned the study to assess of periodontal health in patients with sickle cell disease.

MATERIALS AND METHODS:

The study was conducted in the Department of Periodontics of the dental institution.The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. A total of 30 patients with SCD from the medical hospital were included in the study group. Study group comprised of sickle cell disease patients of both sex and varying age groups. A control group of 20 patients matched for age and sex was also included. Study was conducted for a period of one year. The patients suffering from other diseases known to influence dental caries or severity of periodontal disease were excluded from the study. An informed written consent was obtained from each patient after explaining them the procedure of the study verbally. A thorough general examination and oral examination was conducted for each patient. The

demographic data of the patients was collected using a questionnaire. Autoclaved Plane mouth mirror & pig tail explorer were used to examine the oral cavity. While doing intraoral examination, we used Plaque index given by Silness & Loe and Gingival index given by Loe&Silness for the assessment of periodontal health of each patient.

The statistical analysis of the data was done using SPSS version 20.0 for windows. The Student's t-test and Chi-square test were used to check the significance of the data. The p-value less than 0.05 was predetermined as statistically significant.

RESULTS:

Table 1 shows the demographic data of the study group. The mean age of the patients was 36.19 years. The number of male patients was 14 and he number of female patients was 16. Table 2 shows the comparative analysis of mean plaque index and mean gingival index in patients with sickle cell disease and control group. The mean plaque index in sickle cell disease group was 3.11±1.16 and in control group was 2.1±0.89. The mean gingival index of sickle cell disease group was 2.75±1.77 and in control group was 1.82 ± 0.87. On comparing the results, we observed that results are statistically significant for Plaque index and Gingival index ($p<0.05$). [Fig 1]

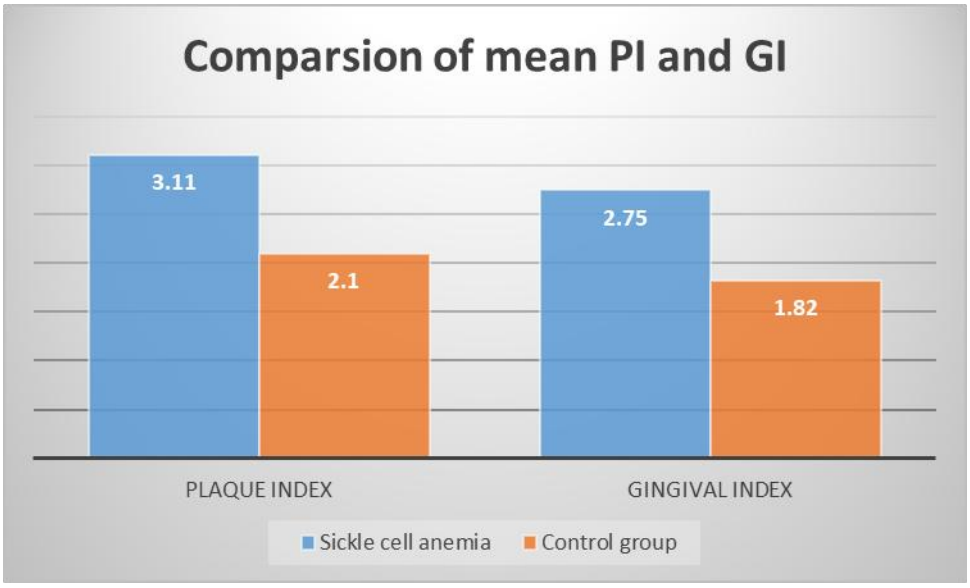
Table 1: Demographic data of the patients

Parameters	**Study group (n=30)**	**p-value**
Mean Age (years)	36.19	0.22
Number of male patients	14	0.31
Number of female patients	16	0.16
Socioeconomic status • Rich • Middle class • Poor	 • 12 • 14 • 4	0.8
Dietary habits • Vegetarian • Non-vegetarian	 • 18 • 12	0.39

Table 2: Comparative analysis of mean plaque index and mean gingival index in patients with sickle cell anemia and control group

Indices	**Sickle cell disease (n=30)**	**Control group (n=20)**	**p-value**
Plaque index (Mean±SD)	3.11±1.16	2.1 ± 0.89	0.001
Gingival index(Mean±SD)	2.75±1.77	1.82 ±0.87	

Figure 1: Comparative analysis of mean plaque index and mean gingival index in patients with sickle cell anemia and control group



DISCUSSION:

In the present study we assessed the periodontal health in patients with sickle cell disease.We observed that Plaque index score and Gingival index score are significantly raised in patients with sickle cell disease as compared to normal healthy individuals. This predicts that patients with sickle cell disease are more prone to periodontal diseases. The results were statistically significant. The results were compared with previous studies and results were consistent with previous studies. Passos CP et al investigated the prevalence of dental caries and periodontal condition in a population with sickle cell disease (SCD), analyzing some associations with disease severity. The Decayed, Missing and Filled Teeth index (DMFT) and Community Periodontal Index (CPI) were recorded for 99 individuals with SCD and 91 matched controls. Socio-demographic status, oral health behaviors, and history of clinical severity of SCD were assessed. Statistical comparisons were performed between the group with SCD and the control group, as well as multivariate logistic regression analyses with DMFT index and CPI as the dependent variables. The mean number of decayed teeth was significantly higher in individuals with HbSS. Older age, female gender, and daily smoking were identified as risk factors for higher DMFT, while older age and absence of daily use of dental floss were risk factors for the development of periodontal disease. In conclusion, risk factors known to cause caries and periodontal disease had more influence on oral health than the direct impact of SCD. Laurence B et al determined whether there was an association between sickle cell disease (SCD) and dental caries in African-American adults. A sample of 102 African-American adult patients with SCD from Washington, D.C., and Baltimore, Maryland, were matched to 103 African-American adult subjects, who did not have SCD. The match was by age, gender and recruitment location. Each subject underwent a standardized oral examination as well as an interview to ascertain risk factors for dental caries. For individuals with incomes of less than $15,000, subjects with SCD had more decayed (10.36 versus 1.58) and fewer filled (2.86 versus 8.45) surfaces compared to subjects without SCD with both differences being statistically significant after adjusting for age and gender. The results suggest that low-income African Americans with SCD may be at Increased risk for dental caries and are less likely to receive treatment with a restoration.[7, 8]

Al-Alawi H et al investigated the prevalence of dental caries and periodontal disease and examine the possible association between oral health deterioration and SCD severity in a sample of Saudi SCD patients residing in the city of Al-Qatif, Eastern Province, Saudi Arabia. Dental examination to determine the Decayed, Missing and Filled Teeth index (DMFT), Community Periodontal Index (CPI), and plaque index system were recorded for 33 SCD patients and 33 age and sex-matched controls in the Al-Qatif Central Hospital, Qatif, Saudi Arabia. Self-administered surveys used to assess socio-economic status; oral health behaviors for both SCD patients and controls were recorded. In addition, the disease severity index was established for all patients with SCD. SPSS data analysis software package version 18.0 was used for statistical analysis. Numerical variables were described as mean with a standard deviation. Decayed teeth were significantly more in individuals with ages ranging from 18 to 38 years with SCD compared to the control group ($p = 0.036$) due to oral hygiene negligence. The mean number of filled teeth was significantly lower in individuals with SCD when compared to the control group due to the lack of appropriate and timely treatment reflected in the survey responses of SCD patients as 15.2% only taking oral care during hospitalization. There were differences between the cases and controls in the known caries risk factors such as income level, flossing, and brushing habit. The DMFT, CPI, and plaque index systems did not differ significantly between the SCD patients and the control group. They concluded that patients with SCD have increased susceptibility to dental caries, with a higher prevalence of tooth decay and lower prevalence of filled teeth. Singh J et al assessed the dental and periodontal health status of beta thalassemia major and sickle cell anemic patients in Bilaspur, Chattishgarh, India. A total of 750 patients were included in the study. The patients were randomly divided into three groups I (n=250), II (n=250) and III (n=250), ranging from 3-15 years. After performing a thourough general examination, including their demographic data, intraoral examination was done using Decayed-Missing-Filled Teeth Index (DMFT Index), Plaque index (PI) and Gingival index (GI). It was found that, prevalence of dental caries and periodontal diseases was significantly more in beta thalassemic patients followed by sickle cell anemic patients than control group. However, when group I (beta thalassemia) was compared with group II (sickle cell anemia), results were found to highly significant only for decayed missing filled tooth. They concluded that appropriate dental and periodontal care improves a patient's quality of life. Preventive dental care is must for thalassemic and Sickle cell disease patients.[9, 10]

CONCLUSION:

From the results of the current study we conclude that periodontal diseases are very prevalent in patients with sickle cell disease. Thus, preventive dental care is very important for SCD patients.

REFERENCES:

1. Carvalho SC, Carvalho LC, Fernades JG, Santos MJ. In search of equity in the Brazilian health system: The case of sickle cell disease. Saude Soc. 2014;23:711–8.
2. Cançado RD, Jesus JA. The sickle cell disease in Brazil. Rev Bras HematolHemoter. 2007;29:203–6.
3. Brasilia, Brazil: Ministry of Health; 2009. Department of Health Care Department of Specialized Care. Education Handbook for Health-Care Line in Sickle Cell Disease.

4. S Chen, A Eldor, G Barshtein, S Zhang, A Goldfarb, E Rachmilewitz, et al. Enhanced aggregability of red blood cells of beta-thalassemia major patients. Am J Physiol. 1996;270:1951–1956.
5. S De Silva, CA Fisher, A Premawardhena, SP Lamabadusuriya, TE Peto, G Perera, et al. Thalassaemia in Sri Lanka: implications for the future health burden of Asian populations. Sri Lanka Thalassaemia Study Group. Lancet. 2000;355:786–791.
6. NF Olivieri, Z Pakbaz, E Vichinsky. Hb E/beta-thalassaemia: a common & clinically diverse disorder. Indian J Med Res. 2011;134:522–531.
7. Passos CP, Santos PR, Aguiar MC, Cangussu MC, Toralles MB, da Silva MC, Nascimento RJ, Campos MI. Sickle cell disease does not predispose to caries or periodontal disease. Spec Care Dentist. 2012 Mar;32(2):55-60. doi: 10.1111/j.1754-4505.2012.00235.x.
8. Laurence B, George D, Woods D, et al. The association between sickle cell disease and dental caries in African Americans. Special care in dentistry: official publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry. 2006;26(3):95-100.
9. Al-Alawi H, Al-Jawad A, Al-Shayeb M, Al-Ali A, Al-Khalifa K. The association between dental and periodontal diseases and sickle cell disease. A pilot case-control study. Saudi Dent J. 2015 Jan;27(1):40-3. doi: 10.1016/j.sdentj.2014.08.003. Epub 2014 Nov 27.
10. Singh J, Singh N, Kumar A, Kedia NB, Agarwal A. Dental and Periodontal Health Status of Beta Thalassemia Major and Sickle Cell Anemic Patients: A Comparative Study. J Int Oral Health 2013; 5(5):53-8.

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