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Periodontology

Status of Periodontal Health of Patients in the Drepanocyteurs at the Bamako Dreponocytosis Research Center (CRLD) in Mali: 446 Observations

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Abstract: Sickle cell anemia or sickle cell anemia is a chronic, inherited, autosomal recessive inherited hemolytic disease that may be a risk factor for periodontal disease. The objective of this study is to evaluate the periodontal health status of sickle cell patients followed at the Center for Research and Control of Sickle Cell Disease (CRLD) in Bamako. This was a cross-sectional descriptive study lasting six (6) months. It involved 446 sickle cell patients followed at the CRLD. Included were all patients who attended the CRLD and who agreed to answer the questionnaire and be examined. Patient and parent informed consent for minors was obtained prior to inclusion. An oral examination consisting of a dental examination, a periodontal examination and x-ray were performed. For periodontal examination, Loe and Silness plaque and gingival indices and CPITN index were used to assess plaque control, gingival inflammation, and treatment need, respectively. The data analysis was done by the SPSS 19.0 software and the input from the Microsoft Excel 2013 software. The female sex was most represented in the sample with 54.04% with a Sex ratio of: 0.85, The slice of The most represented age was 13-25 years old (36.78%). The Sβ + thalassemic forms had the highest mean Hb level at 10.59g / dl. We found a low plaque control score at 3.73% of cases only in sickle cell SS for a $p \leq 0.0001$. There is a statistically significant relationship between plaque control and various forms of sickle cell $p < 0.001$. The need for periodontal therapy was noted in 68.36% of patients. There is a statistically significant relationship between gingival inflammation and various forms of sickle cell disease $p < 0.001$. 60.54% of patients had a mean plaque index (≤ 2 on the Loe and Silness scale). Gingival inflammation was greater in homozygotes. The evaluation of the periodontal health of the patients examined revealed a need for periodontal treatment that can be summed up as motivation for oral hygiene and decalcification. These data show that the systematic and early management of children with sickle cell disease in general oral and periodontal in particular is a must to minimize the risk of infectious which is not negligible. These lessons in oral hygiene will undoubtedly contribute to minimizing the impact of infectious risk on the periodontium.
Keywords: Periodontal status, Plaque index, gingival index, sickle cell disease Periodontal disease, Sickle Cell Forms, CPITN, CRLD.

INTRODUCTION

Periodontal diseases (PM) or periodontal disease are multifactorial diseases with infectious etiology and inflammatory manifestations leading to the destruction of tooth support tissues [1]. In addition to the bacterial biofilm as a primary etiological factor, other secondary etiological factors or risk factors determine the onset, progression and clinical presentation of periodontal disease [2]. Among these risk factors, some such as diabetes, smoking, deficiencies of neutrophils have been strongly correlated with periodontal disease especially periodontitis while other factors such as chronic kidney

disease and rheumatoid arthritis and sickle cell disease are still at the stage of supposed correlation [3].

Sickle cell anemia or sickle cell anemia is a chronic, inherited, autosomal recessive inherited red blood cell disease. It is due to the presence of hemoglobin S in red blood cells, responsible for their sickle deformation in hypoxia. The heterozygous (AS) form, which is typically asymptomatic, is distinguished from major sickle cell syndromes that include the homozygous form (SS) and the associated forms (S-C or S beta thalassemia) [4]. It is a polymorphic disease whose main recurrent symptom is intense pain. Its morbidity and its impact on the daily lives of patients and their families are major. Due to the high susceptibility to infections, some studies have reported that patients with sickle cell disease are more susceptible to periodontal disease [5]. However, other studies refute this hypothesis and find no significant link between sickle cell disease and periodontal disease [6]. It is in this context that we initiated this study whose objective was to assess the periodontal health status of sickle cell patients followed at the Bamako Center for Research and Control of Drepanocytosis (CRLD) by a cross-sectional study.

MATERIALS AND METHODS

This is a cross-sectional, descriptive study that took place over a period of six (6) months. The study population consisted of all patients diagnosed with sickle cell disease and followed up at the CRLD. Recruitment was accidental in all cases. Included were any sickle cell patients who had attended the CRLD and who agreed to answer the questionnaire and to be examined at the oral level. All patients who had no records or had not been included in our study were excluded from the sample those with incomplete records (not containing data on the exact form of sickle cell disease and biological examinations such as as the Hb level) and / or not wishing to participate in the study. Patient and parent informed consent for minors was obtained prior to inclusion. Oral examination was summarized as a dental and periodontal examination. The dental examination consisted of identifying caries, dental malpositions, dental mobility, and fluorosis, non-carious lesions (erosions, attrition, abrasions, abfractions, and fractures). Periodontal examination assessed oral hygiene; gingival inflammation, periodontal pockets. Oral hygiene was assessed through the Loe and Silness plaque index; the inflammation was highlighted by the gingival index of Loe and Silness. The CPITN index measured periodontal pockets and periodontal treatment requirements. Radiographic examinations (retro-alveolar and panoramic) were performed to assess the deep periodontium (alveolar bone level) and to confirm or refute the diagnosis of gingivitis or periodontitis. We used a survey form on which we transcribed socio-demographic data and biological results recorded in the patient follow-up log.

The Epi info software was used to calculate frequencies, averages, standard deviations and percentages. Data analysis was done using SPSS 19.0 software and input from Microsoft Excel 2013 software.

RESULTS

A total of 446 sickle cell patients were included in the sample. Females were the most represented with 54.04% of cases. Sex ratio: 0.85 (Table I). The most represented age group was 13-25 years (36.78%) with extremes of 3 years and 59 years and an average age of 31 years (Table II). The Sβ + thalassemic forms had the highest mean Hb level at 10.59g / dl and a standard deviation of 1.70 (Table III).

The patients had an average plaque index in 60.54% (Table IV). Sickle cell disease. Our patients had gum inflammation in 77.13% of cases and 22.87% had clinically healthy gingiva (Table V). Periodontal conditions consisting of gingivitis and periodontitis were the most frequent among oral diseases observed in patients (Table VI). There is a statistically significant relationship between plaque control and different forms of sickle cell p <0.001 (Table VII). There is a statistically significant relationship between gingival inflammation and various forms of sickle cell disease p <0.001 (Table VIII). The need for periodontal treatment was noted in 68.36% of patients (Table IX).

Table-I: Distribution of patients by sex

Sex	Effective	Frequency (%)
Female	241	54.04
Male	205	45.96
Total	446	100.00

Table-II: Distribution of patients by age group

Age group (in years)	Effective	Frequency (%)
0-12	144	32.29
13-25	164	36.78
26-38	92	20.62
39 or more	46	10.31
Total	446	100.00

Table-III: Mean hemoglobin level

Hemoglobin (Hb) level g / dl	Average	Standard deviation
SS N : 317	8.35	1.80
SC N : 87	10.59	1.51
Sβ+ N : 29	10. 9	1.71
Sβ° N : 13	8.2	1.67

Table-IV: Frequency Distribution by Plate Control

Plate control	Effective	Frequency (%)
Excellent (0)	49	10.99
Good (0.1 to 0.6)	104	23.31
Medium (0.7 to 1.9)	**270**	**60.54**
Low (2 to 3)	23	5.16
Total	446	100.00

Table-V: Distribution of patients according to the degree of gingival inflammation

Gingival index	Effective	Frequency(%)
Absence : 0	102	22.87
Light : 0.1 to 0.6	39	8.74
Average : 0.7 to 1.9	**296**	**66.37**
Severe : 2 to 3	9	2.02
Total	446	100.00

Table-VI: Distribution of patients according to other oral diseases

Oral disorders	Effective	Frequency (%)
Carious lesions	77	17,26
Periodontal disorders	277	62.10
Dental malocclusion	31	6.95
Dental mobility	20	4.48
Erosion, abfraction, dental abrasion	16	3.58
Dental Fluorosis	16	3.58
Halitosis	8	1.79
Stomatitis	3	0.67

Table-VII: Distribution of patients by plaque control (PI) and hemoglobin phenotype

Plate control	Sickle cell forms				Total
	SS %	SC %	Sβ° %	Sβ+ %	
Excellent (0)	181 40.58%	22 25.28 %	5 38.46%	13 44.83 %	221
Good (0.1 to 0.6)	93 38.59 %	14 16.10%	3 23.08 %	6 20.69 %	116
Average (0.7 to 1.9)	34 14.11 %	51 58.62 %	5 38.46 %	10 34.48 %	100
Low (2 to 3)	9 3.73 %	-	-	-	9
Total	100.00%	100.00 %	100.00 %	100.00 %	
	317	87	13	29	446

Table-VIII: Distribution of sickle cell forms according to gingival inflammation

Gingival index	Sickle cell forms				Total
	SS %	SC %	Sβ+ %	Sβ° %	
Absent (0)	123 38.80%	49 56.32%	21 72.42 %	7 53.85 %	200
Light (0.1 to 0.6)	125 51.87 %	23 26.44 %	5 17.24 %	6 46.15 %	159
Average (0.7 to 1.9)	66 27.39 %	15 17.24 %	3 10.34%	0 0.00 %	84
Severe (2 to 3)	3 1.24 %	0 -	0 -	0 -	3
Total	100.00%	100.00 %	100.00%	100.00 %	
	317	87	29	13	446

Table-IX: Distribution of patients according to the CPITN index

Score CPTIN	Need treatment	Frequency (%)
0: healthy periodontium	No treatment	31.64%
1: At least one tooth with bleeding	Teaching in oral hygiene	32.49%
2: At least one tooth with tartar	Teaching in hygiene and descaling	21.94%
3: At least one tooth with a pocket of 4 to 5mm	Hygiene education with descaling and curettage	10.13%
4: At least one tooth with a 6mm pouch	Complex treatment	3.80%

DISCUSSION

Our work is part of an analytical descriptive cross-sectional study based on the observation of the periodontal health status of sickle cell patients followed at the Center for Research against Sickle Cell Disease (CRLD). Our sample consisted of 446 sickle cell patients, 54.4% of who were female and 45.96% male with a sex ratio of 0.85. This female predominance, however, does not directly reflect a link between sickle cell disease and sex, and this character was not a selection criterion. NACOULMA *et al*. in Burkina Faso [8] found results consistent with ours with a sex ratio of 0.8. This result is probably due to random consultations in the hospital structure in which the survey took place.

According to the age group of our sample, all our patients were between 3 and 59 years old, and the most represented age group was 13-25 years old, ie 36.78% with an average age of 31 years. This result is contrary to that of Diagne *et al*. in Senegal [9]. In our underdeveloped countries, sickle cell disease has remained in the circle of diseases with a reduced life expectancy (rarely exceeding 50 years) and the complications of the disease appear very early in its homozygous form (SS).

N our study, 62.10% of patients had periodontal disease. Clinical observation allowed us to identify certain periodontal pathologies, some of which needed additional examinations for simple and / or complex treatment. The periodontal diseases encountered were: chronic periodontitis, aggressive periodontitis, necrotizing periodontal diseases, periodontitis associated with systemic diseases. This result is comparable to that of DIAGNE I. [10], after a study on major sickle cell disorders in pediatrics in Dakar.

In our study, the homozygous form (SS) accounted for 71.08% of patients. This form SS is the most common and this may be due to consanguineous marriages as they are more and more numerous, but also couples marry without screening and in general for a couple to have a child sickle cell SS it will be necessary that the father and the mother are each bearer of trait sickle cell.

With regard to hemoglobin, the Sβ + thalassemia forms had the highest average with 10.59g / dl and a standard deviation of 1.70g / dl. In our study population, 77.13% of sickle cell patients had gingival inflammation and 65.70% of patients had a plaque index greater than 0.6 that is, oral hygiene was average.

Nevertheless, during periodontal examination, it was observed that the greatest severity was observed in homozygotes (SS). During the study, inflammation and severe bleeding were more frequent in these patients, especially in homozygotes (SS) 80.5% (Table IX). In addition, these patients had significant dental plaque deposits. On the other hand, the presence of microbial plaque is a factor responsible for inflammation and bleeding.

It is also established in the literature that in sickle cell patients, particularly homozygotes, vaso-occlusive attacks are relatively frequent, in infancy and before 20 years of age. It may be understandable that oral hygiene is disrupted by these crises, which often result in bed rest.

Results from the CPITN index showed that 68.36% of patients needed periodontal therapy. This need was divided into teaching oral hygiene: 32.49% of cases had at least one tooth with bleeding, descaling (21.94%), scaling and curettage (10.13%) with a periodontal pocket of 5 to 6 mm, a complex treatment (3.80% of cases have at least one tooth with a 6mm pouch).

These results are lower than those recorded by MENGEL *et al*. [11] who estimated in 1993 that 93.10% of German sickle cell children aged 15 to 19 years would need periodontal care. The intersection of the various periodontal clinical parameters and the different forms of sickle cell disease show that in terms of proportion, homozygous patients (SS) have a more affected periodontal state (Tables VII and IX).

The inflammation index is higher in homozygotes (SS) compared to other sickle cell forms with a statistically significant difference and the plaque control index was much more represented in SC and Sβ ° thalassemia's than in other forms. AROWOJOLU *et al*. [12] found no difference between sickle cell disease and these periodontal clinical parameters, in a group of patients between 11 and 19 years old in Nigeria. They concluded that sickle cell disease does not accentuate periodontal disease in Nigerian adolescents.

Despite the low number of patients, it is possible that the more severe anemia in homozygotes is responsible for the decrease in attention to hygiene because of the symptomatology more marked by the frequency of sickle cell crises. This corroborates the results of RADA *et al*. [13] who reported a correlation between sickle cell crisis and periodontal infection, the first signs of which are inflammation and bleeding. CRAWFORD [14], however, found no significant difference between gingivitis and periodontitis in his blind study of 78 sickle cell patients. In our study there is a statistically significant relationship between different forms of sickle cell to that of plaque control and gingival inflammation.

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