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Burden of Depression and Associated Factors among Patients with Sickle Cell Disease in Fako Division, Cameroon

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Abstract

Background: Depression is a major public health challenge causing significant suffering and disability worldwide. Patients with Sickle Cell Disease (SCD) suffer from various complications during their lifetime and are prone to depression. However, there is a paucity of information on depression and associated factors among sickle cell patients in Cameroon.

Objectives: To determine the prevalence of depression and associated factors among patients with SCD aged 7-40 years receiving care in three hospitals in Fako Division.

Methods: We carried out a hospital based cross-sectional descriptive and analytic study. Socio-demographic data, clinical variables and depressive symptoms were evaluated using a structured questionnaire. Depression was evaluated using the Patient Health Questionnaire Module 9 and the Children's Depression Inventory. The Statistical Package for Social Sciences (SPSS) version 25 was used for analysis of data. Statistical significance was set at p value <0.05 while bivariate and multivariate analysis was used to test for associations.

Results: We recruited 163 participants and the prevalence of depression was 43%(n=70), of which 30.67%(n=50) were mildly depressed and 12.27%(n=20) were moderately depressed. The prevalence of suicidal ideation was 20%. On multivariate analysis, an unmarried status (AOR 7.41; 95%CI 1.74-31.54, P<0.007) high pain intensity (AOR 8.70; 95%CI 17.77-42.82, P<0.008) and history of painful crises within the previous month (AOR 7.31,95%CI 1.52-35.14, P<0.013) were associated with depression among these patients.

Conclusion: Almost half of our patients with SCD are depressed, with 2 of them out of 10 thinking of suicide. Some socio-demographic and clinical factors induce this depressive state.

Keywords: Burden; Depression; Sickle Cell Disease; Prevalence; Associated Factors; Suicidal Tendency

Abbreviations

BHM: Baptist Hospital Mutengene; CDI: Children Depression Inventory; DSM-5 Diagnostic Statistical Manual of Mental Disorder Module; SCD: Sickle Cell Disease; PHQ-9: Patient Health Questionnaire Module 9; VOC: Vaso Occlusive Crisis; WHO: World Health Organisation

Introduction

Sickle Cell Disease (SCD) is a group of inherited erythrocyte disorders wherein there are mutations in the gene encoding the beta subunit of hemoglobin [1]. Homozygous haemoglobin S (HbSS) is the most common and most severe form of SCD. Its primary symptomatic manifestation is pain, particularly acute episodes of ischemic pain, often referred to as ''crises" [2].

In 2006, the World Health Organization (WHO) declared sickle cell disease a public health problem due to its high annual birth prevalence of 275000. About 75% of these births occurred in sub-Saharan Africa with Cameroon being the 6th African country with the highest number of SCD births per year (7,172 births) after Nigeria, Democratic Republic of Congo, Tanzania, Uganda and Angola [3]. The prevalence of the sickle cell trait in the Central African region is estimated to range between 20-30% and the disease attacks about 2% of the Cameroonian population (about 400 000 patients) [4]. Despite this burden, there is no national SCD programme in Cameroon as reported by Agborndip, et al., [5]. The disease is severe and results in significant morbidity, as well as shortened lifespan.

Pedopsychiatry is synonymous with child psychiatry and deals with mental disorders in children [6]. Convention on the Rights of the Child defines a child or infant as any person under 18 years of age and childhood is the period of life between 0 and 12 years of age and adolescence between 12 and 18 years of age, who build their identities based on their social, cultural and economic location, in the community and in intra and intergenerational relationships [7]. Mental health is the state of emotional, cognitive and behavioral balance that allows the individual to function responsibly in their family, social and work environment, as well as to enjoy well-being and quality of life [6]. Mental disorder: it is the emotional, cognitive alteration and / or behavior in which basic psychological processes such as emotion, motivation, consciousness, behavior, perception, learning and language are affected, making it difficult for the person to adapt to the cultural and social environment in which they live in, generating some form of subjective discomfort [6,8].

Depression has been considered by WHO as the most disabling pathology in terms of the number of years of global disability [9]. In 2017, WHO estimated that over 300 million people suffer from depression which was approximately 4.4% of the world's population [10]. It is different from usual mood fluctuations and short-lived emotional responses to challenges in everyday life. It can cause the affected person to suffer greatly and function poorly at work, at school and in the family. At its worst, depression can lead to suicide. Close to 800,000 people die due to suicide every year and it is the second leading cause of death in 15-29-year-olds [11]. According to statistics released on September 9, 2019 by the World Health Organization (WHO), the suicide rate is estimated at 19.5 per 100,000 inhabitants in Cameroon which places it among the 10 African countries that recorded the highest suicide rate between 2000 and 2019 [12].

Significant number of patients with sickle cell disease are at risk of depression [13]. Comorbid depression in these patients is associated with a more severe course and poorer disease outcomes. However, clinicians often fail to recognize the presence of depression. The prevalence of depression in SCD ranged from 4%-46% according to a systematic review carried out in the US [14]. In sickle cell disease, depression is associated with pain, poor treatment compliance and lower quality of life [15]. In 2015, Lukoo and colleagues in Congo showed that the prevalence of depression among children and adolescents with SCD was as high as 86.4% [16]. In Cameroon, a study by Chetcha and colleagues in 2018 in Central hospital Yaounde showed that the prevalence of depressive disorders was 29.5% among adults with SCD. The associated factors identified were unsatisfactory social support, the presence of current complications linked to sickle cell disease, hospitalization within the last 12 months and the number of painful crises within the last 12 months [4].

Depression in SCD has been reported to be related to more negative medical outcomes including pain crises and hospitalizations [17]. This study will add to what is already known and provide evidence-based data on the prevalence of depressive symptoms and the factors associated among patients with SCD receiving care in three hospitals in Fako division. This will inform clinicians, hospital administrators and policymakers on the prevalence of depression and the factors associated with it which will help develop tailored interventions to address these factors, permitting early screening and identification of these factors to prevent them and reduce the severe pain-depression burden on these patients. Thus, we decided to determine the prevalence of depression, to determine the severity of depression and prevalence of suicidal ideation and to identify the factors associated with depression among patients with Sickle Cell Disease in Fako Division.

Material and Methods

We conducted a hospital based cross sectional study in three hospitals in Fako division, considering the patient turn over and capacity of the hospital to manage sicklers and their complications. These hospitals were the Buea and Limbe Regional hospitals which are both university teaching hospitals and one mission health facility; Baptist Hospital Mutengene (BHM) which has a Sickle cell unit. Individuals aged 7-40years, who were either diagnosed of SCD via haemoglobin electrophoresis or previously

hospitalized with a history of SCD in the study sites between January 1st 2016 and January 1st 2021 and patients below 18 years who had their guardians consent were included in the study and consecutive sampling was used to recruit participants. We excluded Sickle cell patients who were currently admitted in the hospital. Such patients' responses with regards to depressive symptoms may be overrated.

Patients' addresses were extracted from hospitalization and laboratory registers and contacted by a doctor in each facility. Thereafter, they were invited to the hospital for the study via telephone calls and text messages. Repeated calls and text messages were sent as reminders on subsequent days to those who did not respond initially. In BHM, patient questionnaires were also administered on their visit days which is on the first Saturday of every month during the study period.

The minimum sample size was estimated at 126 sicklers and to cover for non-consenting patients and those excluded, we added 10%, to the minimum sample size. Therefore, the minimum sample size for our study was 139. Ethical approval to carry out this study was obtained from the delegation of Public Health for the Southwest Region and the directorate of the hospitals involved in the study. In these hospitals, we then proceeded to recruit our participants. All participants in the study received a participant information sheet. Following clear explanation of the information sheet, the participants were required to sign an informed consent form. Guardian and or parental consent was sought for patients aged 18 and below.

A structured questionnaire was then filled by the participants and their caregivers for patients less than 18years. Questions were asked to the participants in their first language and responses were filled by the principal investigator. Participants benefitted from free medical consultation and a 500ml bottle of mineral water each upon completion of the questionnaires. The questionnaire was composed of 4sections: Socio- Demographic data, clinical variables, pain assessment and assessment of Depression.

For the assessment of Depression, The Patient Health Questionnaire module 9(PHQ-9) was used to assess depression in patients aged 18 Years and above [18].

This easy-to-use patient questionnaire is a self-administered version of the PRIME-MD diagnostic instrument for common mental disorders [10]. The PHQ-9 is the depression module, which scores each of the nine DSM-IV criteria as "0" (not at all) to "3" (nearly every day). It has been validated for use in primary care. The PHQ-9 has 61% sensitivity and 94% specificity in adults. Depression Severity: 0-4 none, 5-9 mild, 10-14 moderate, 15-19 moderately severe, 20-27 severe. This screening instrument assesses suicidal ideation and has been used in a similar study in Yaounde to assess depression among adults with SCD [4].

In children, depression was measured with the Children's Depression Inventory (CDI) which is a child self-report inventory of depressive symptoms. It has high internal consistency, test-retest reliability and established validity with an alpha coefficient of 0.86. The CDI is the most established and widely used measure of depressive symptoms for children. The CDI is a 27-item scale appropriate for children and adolescents aged 7-17 years and yields scores for five subscales: negative mood, interpersonal problems, ineffectiveness, anhedonia and negative self-esteem. There are three response options for each item: 0 = absence of symptoms, 1 = moderate symptoms and 2= severe symptoms, with higher scores indicating increasing severity. The maximum score is 54, with a score over 12 suggesting a depressive state [19]. The CDI can be used as a screening tool for depressive symptoms, including suicidal ideation in medically ill children. In addition, the CDI has been shown to be suitable for use with a mixed sample of in- and out-patients with acute conditions and chronic diseases including Sickle Cell Disease [20].

The questionnaire was checked daily to ensure correct entry of information. Data was entered daily into a computer, whose password was known just to the principal investigator. The questionnaires were locked up in a safe, accessible only to the investigator. The Data was then analyzed using SPSS version 25.0. Categorical variables were summarized using frequencies and proportions while continuous variables were summarized using means and standard deviation. Multivariate and bivariate analysis were used to verify which socio-demographic and clinical variables were significantly associated with depression among patients with SCD.

Results

A total of 203 contacts of patients who met the age criteria were extracted from the hospitalization and laboratory haemoglobin electrophoresis registers that were available in these health facilities. Of these, 40 patients were excluded for the following reasons: 17 participants were not reachable despite several calls and text messages, 10 patients had relocated out of the Southwest Region and thus were not available, 5 caregivers did not give their consent, 8 patients were reported dead by their caregivers. We had 163 participants with a response rate of 80.3%.

With respect to the sociodemographic data, the mean age of participants was 17.1+/-6.7 and the range was 7- 40years. Most of the participants were male 52.1%(n=85) with a F:M ratio of 1:1.1. Majority of patients 88.3% (n=144) lacked health insurance and 27% (n=44) were from homes with a direct monthly income less than 70,720FCFA (Table 1).

The prevalence of depression amongst sickle cell patients was 43% (n=70), of which 30.67% (n=50) were mildly depressed and 12.27% (n=20) were moderately depressed (Fig. 1). Amongst the depressed patients, half above 18 were depressed (n=34) while approximately a third of patients less than 18 were depressed. The mean PHQ-9 score was 6.5+/- 5.0, while the mean CDI score was 12.0+/-6.9. No patient was severely depressed but 1 out of 5 patients had suicidal ideation (Table 2).

With respect to the past medical history, the mean number of blood transfusions per year was 1.4+/-1.9, meaning fewer patients were poly transfused per year. Majority of patients were rarely admitted per year 79.1% (n=129) and 44.8%(n=73) of patients had crises in the previous month. The mean pain intensity was 48.5+/- 12.9. Most of the patients 84.7% (n=138) reported to be compliant to their medication. Among those who were non-compliant to their medication 15.3% (n=25), majority 72% (n=18) did not comply due to the fact that their medication is expensive. One out of five patients had comorbidities and or complications linked to SCD. The commonest complication was leg ulceration 9.2% (n=15), followed by avascular hip necrosis 4.3% (n=7) and stroke 3.7% (n=6).

When analysis for associated factors was done, being unmarried, unemployment, low direct monthly income and lack of health insurance were socio-demographic factors associated with depression (Table 3). Presence of comorbidities, frequent hospitalisations, frequent monthly crises and high pain intensity were clinical factors significantly associated with depression. (Table 4). Also, non-compliance to medication, rare physical exercise, alcohol consumption and recent bereavement were significantly associated with depression (Table 5). On multivariate analysis, being unmarried, having more than one crisis a month and high pain intensity were associated with depression (Table 6).

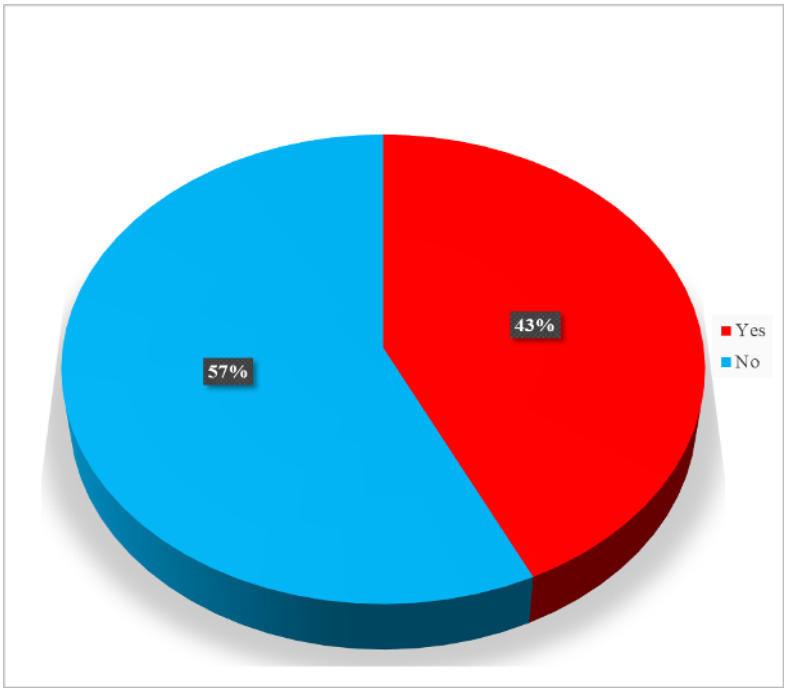

Figure 1: Pie chart showing prevalence of depression in sickle cell disease.

Variable	Frequency(n)	Percentage (%)
Age, n=163		
<11	29	17,8
11-20	91	55,8
21-30	40	24,5
31-40	3	1,8
Sex		
Females	78	47,9
Males	85	52,1
Parental Marital Status		
Divorced	11	6,75
Married	87	53,37
Single	22	13,50
Marital Status		
Divorced	03	1,84
Married	11	6,75
Single	29	17,79
Level of Education		
None	1	0,61
Primary	52	31,90
Secondary	63	38,65
Tertiary	47	28,83
Occupation, n=122		
Employed	114	93,44
Unemployed	8	6,56
Income (FCFA)		
<70720	44	26,99
≥70720	119	73,01
Insurance		
No	144	88,34
Yes	19	11,66

Table 1: Socio-demographic data of participants.

Variable	Frequency(n)	Percentage (%)
Depression		
Yes	70	42,94
No	93	57,06
Depression Class		
No	93	57,06
Mild	50	30,67
Moderate	20	12,27

PHCM Score, n=68		
Mild	18	26,47
Moderate	16	23,53
No	34	50,00
CDI Score, n=95		
Mild	32	33,68
Moderate	4	4,21
No	59	62,11
Suicidal Ideation		
No	130	79,75
Yes	33	20,25

Table 2: Diagnosis and classification of depression.

Variable	Depression		OR (95%CI)	P value
	No	Yes		
Age(years)				
<18	59(62.1)	36(37.9)	1	
≥18	34(50.0)	34(50.0)	1.64 (0.87-3.08)	0.124
Sex				
M	52(61.2)	33(38.8)	1	
F	41(52.6)	37(47.4)	1.42 (0.76-2.65)	0.267
Married				
Yes	70(71.4)	28(28.6)	1	
No	23(35.4)	42(64.6)	4.57 (2.33-8.93)	<0.001*
Tertiary Education				
Yes	24(51.1)	23(48.9)	1	
No	69(59.5)	47(40.5)	0.71 (0.36-1.41)	0.325
Occupation				
Employed	68(59.6)	46(40.4)	1	
Unemployed	1(12.5)	7(87.5)	10.35 (1.23-86.94)	0.009*
Income(FCFA)				
≥70720	81(68.1)	38(31.9)	1	
<70720	12(27.3)	32(72.7)	5.68 (2.64-12.24)	<0.001*
Insurance				
Yes	15(78.9)	4(21.1)	1	
No	78(54.2)	66(45.8)	3.17 (1.00-10.03)	0.040*
* P<0.05 is considered Significant				

Table 3: Association between socio-demographic factors and depression.

Variable	Depression		OR (95%CI)	P-value
	No	Yes		
Comorbidity/Complication				
Absence	85(64.9)	46(35.1)	1	
Presence	8(25.0)	24(75.0)	5.54 (2.31-13.23)	<0.001*
Transfusion/year				
<2	90(69.8)	39(30.2)	1	
≥2	3(8.8)	31(91.2)	23.85 (6.88-82.67)	<0.001*
Hopital Visits				
≤3	90(69.8)	39(30.2)	1	
>3	3(8.8)	31(91.2)	23.85 (6.88-82.67)	<0.001*
Crisis within the past month				
No	77(85.6)	13(14.4)	1	
Yes	16(21.9)	57(78.1)	21.10 (9.41-47.34)	<0.001*
Pain Intensity				
Low	83(78.3)	23(21.7)	1	
High	10(17.5)	47(82.5)	16.96 (7.44-38.67)	<0.001*
Suicidal Ideation				
No	88(67.7)	42(32.3)	1	
Yes	5(15.2)	28(84.8)	11.73 (4.23-32.54)	<0.001*
*P<0.05 is considered Significant				

Table 4: Association between clinical variables and depression.

Variable	Depression		OR (95%CI)	P-value
	No	Yes		
Daily Water Intake			1	
≤2L	85(59.4)	58(40.6)		
>2L	8(47.1)	9(52.9)	1.65 (0.60-4.52)	0.328
Sport				
Rarely	44(42.7)	59(57.3)	1	
Frequently	49(81.7)	11(18.3)	0.17 (0.08-0.36)	<0.001*
Compliance to Medications				
Yes	90(65.2)	48(34.8)	1	
No	3(12.0)	22(88.0)	13.75 (3.92-48.29)	<0.001*
Alcohol consumption				
No	87(60.4)	57(39.6)	1	
Yes	6(31.6)	13(68.4)	3.31 (1.19-9.20)	0.017*

Use of Recreational Drugs				
No	91(58.0)	66(42.0)	1	
Yes	2(33.3)	4(66.7)	2.76 (0.49-15.50)	0.232
Family History of mental illness				
No	90(57.7)	66(42.3)	1	
Yes	3(42.9)	4(57.1)	1.82 (0.39-8.40)	0.438
Loss of Relative				
No	92(60.1)	61(39.9)	1	
Yes	1(10.0)	9(90.0)	13.57 (1.68-109.87)	0.002*
*P<0.05 is considered Significant				

Table 5: Association between depression and behavioural/family history.

Variable	COR	AOR (95%CI)	P-value
Unmarried status	1.64	7.41 (1.74-31.54)	**0.007***
Unemployment	10.35	21.83 (0.88-542.96)	**0.060**
Income <70270fcfa	5.68	3.92 (0.85-18.06)	**0.079**
Presence of Complication/Comorbidity	5.54	1.40 (0.22-8.94)	**0.725**
Lack of Insurance	3.17	1.13 (0.06-20.65)	**0.933**
Transfusion≥2 times/year	23.85	0.88 (0.07-10.54)	**0.918**
Visits>3 times/year	23.85	5.52 (0.42-17.45)	**0.194**
Rare sports	0.17	0.38 (0.08-1.91)	**0.239**
Alcohol intake	3.31	2.03 (0.13-32.13)	**0.615**
Crisis within the past month	21.10	7.31 (1.52-35.14)	**0.013***
Non-compliance to Medication	13.75	4.24 (0.34-53.37)	**0.264**
Loss of Relative	13.57	3.66 (0.05-258.83)	**0.551**
High Intensity Pain	16.96	8.70 (1.77-42.82)	**0.008***
Suicidal Ideation	11.73	3.87 (0.60-24.94)	**0.155**
*P<0.05 is considered Significant			

Table 6: Multivariate analysis of factors associated with depression.

Discussion

We aimed at determining the prevalence and severity of depression, as well as the factors associated among patients with SCD. We found that 4 out of 10 persons living with Sickle cell were depressed (43%), with a third of them being mildly depressed (30.67%) and a tenth of them being moderately depressed (12.27%). This finding is similar to a study carried out in the US by Hasan et al. wherein the prevalence of depression in SCD was 44% [13]. Our prevalence was however higher than that obtained by Chetcha et al. in a study carried out in Yaounde, wherein the prevalence of depression was 29.5% among young adults with SCD [4]. This could be explained by the fact that the patients in their study were being followed up in a specialized sickle cell clinic with better health care, infrastructure and specialist such as haematologist and as such had a better quality of care compared to the patients in our study. On the other hand, our prevalence was lower compared to a prevalence of 86% among children with SCD in a study carried out by Lukoo and associates in Congo [16]. This higher prevalence could be explained by the fact that most patients in this study were children between the ages of 8-17years. Previous studies have shown that at this age, painful crises or hospitalizations can lead to frequent school absences and difficulty in maintaining school performance and passing grades, which can in turn predispose to depressive symptoms.

The prevalence of suicidal ideation in our study was 20% which was similar to that of Lukoo, et al., which was 23.5% among children and adolescents with SCD in Congo [16] and also Edwards, et al., carried out in the US wherein the prevalence was 29% among African American patients with SCD [21]. However, Alao, et al., in US had a lower prevalence of 10% [22]. This could be explained by the fact that they used a smaller sample size of adults attending a Sickle cell clinic at a university hospital. On multivariate analysis, an unmarried status, high pain intensity within the last three months and presence of a painful crisis in the past month were predictors of depression. A study carried out in South Sudan among school going children and adolescents with SCD demonstrated that divorce among sicklers' families was found to be 6.5% and was significantly associated with depression and anxiety [23]. This is similar to the proportion of patients with SCD from broken homes in our study (8.6%).
Also, family marital status has been shown to be associated with depression according to a study carried by Kliewer et al. where greater family cohesion was associated with more adaptive coping, unlike greater family discord which was shown to be associated with less adoptive coping and made patients more prone to depression [24]. This could be explained by the fact that single patients and children from broken homes or those raised by single parents usually lack adequate social support and are thus more likely to develop depressive symptoms as compared to those with partners [25]. A study conducted by Raji, et al., in Nigeria showed that, greater severity of subjective pain was nearly twice as likely to predict the presence of a current depressive episode after adjusting for other socio-demographic and clinical characteristics [26]. This is in accordance with our study. However, this is in contrast to a study carried out by Levenson and colleagues where depression and anxiety predicted more daily pain and poorer physical and mental quality of life in adults with SCD [26]. This contrast could be explained by the fact that our study measured pain intensity over the past three months on one occasion unlike that carried out by Levenson et al. where patients recorded their daily pain intensities in their personal diaries over a period of three months. Similar to the findings in our study, Chetcha, et al., in Yaounde found that depression in sickle cell patients was independently associated with the presence of painful crises within the previous month. This study has identified associations between depression and pain variables in SCD, but it does not permit conclusions regarding to what extent depression in SCD causes more pain versus having more pain causing depression.

Conclusion

Our findings conclude that, almost half of patients with SCD in Fako Division are depressed, with majority of these patients mildly depressed and a lesser number moderately depressed. Amongst these depressed patients, 1 out of 5, thought suicide will be the best option. It was also demonstrated that, factors associated with depression were an unmarried status, high pain intensity within the previous three months and presence of a painful crisis within the past month. We humbly recommend the need for mental health services in the management of depressed patients with risk for suicide among those with SCD. Standards of clinical care must remain flexible to accommodate the mental health needs of this population of patients. Also, a more aggressive treatment of comorbid depression or depressive symptoms is needed to reduce the severe pain-depression burden on these patients.

Conflict of Interest

The authors have no conflict of interest to declare.

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