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## ASSESSMENT OF FACTORS PRECIPITATING SICKLE CELL CRISES AMONG UNDER 5-YEARS CHILDREN ATTENDING SICKLE CELL CLINIC OF MURTALA MUHAMMAD SPECIALIST HOSPITAL, KANO

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### ABSTRACT

The aims of this study is to assess the factors precipitating sickle cell crises among under 5 years children attending sickle cell clinic of Murtala Muhammad Specialist hospital, Kano. The research was conducted at Murtala Muhammad specialist hospital. Study population constitute 126 children visiting sickle cell clinic of Murtala Muhammad Specialist Hospital. Majority of the respondents agreed that extreme temperature (hot or cold,) infection, travelling to or living in a high altitude, extreme fatigue and dehydration as a result of activity are the factors precipitating sickle cell crisis among under 5-years old children, while majority of the respondent disagreed that exposure to smoke precipitate sickle cell crisis. From findings of this study it is clearly seen that factors precipitating sickle cell crisis among children under 5-years old, attending sickle cell unit of Murtala Muhammad Specialist Hospital Kano are; extreme of temperature hot or cold, infections, exposure to smoke, travelling to or living in a high altitude, extreme fatigue and dehydration as a result of activity and it is also seen that avoiding sudden changes in temperature, treatment and vaccination against childhood infection, reducing exposure to smoke, avoiding travelling to or living in high altitude, keeping balance between activity and rest are very effective in reducing sickle disease.

**Keywords:** sickle cell crises, under 5-years, children

## Introduction

Cell anemia is one of a group of inherited disorders known as sickle cell disease. It affects the shape of red blood cells, which carry oxygen to all parts of the body. Red blood cells are usually round and flexible, so they move easily through blood vessels. In sickle cell anemia, some red blood cells are shaped like sickles or crescent moons. These sickle cells also become rigid and sticky, which can slow or block blood flow. Sickle cell is caused by a mutation in the hemoglobin beta chain in which glutamic acid is substituted with valine at position six on chromosome 11 [1-5]

The understanding of the phenotypic expression of the disease is still limited. However, environmental factors such as cold weather and air quality, infections, fetal hemoglobin level, and other genetic subtypes play a role in the manifestation of the disease. Clinical manifestations are variable and affect multiple systems, and generally cause lower life expectancy [6-10]. Sickling may be precipitated by conditions associated with low oxygen levels, increased blood acidity, or low blood volume [11-16].

The aims of this study is to assess the factors precipitating sickle cell crises among under 5 years children attending sickle cell clinic of Murtala Muhammad Specialist hospital, Kano.

## Materials and Method

### Study area

The research was conducted at Murtala Muhammad specialist hospital.

### Study design

The design used for this study is cross sectional study. This form of design is aimed at collecting data and describing it in a well define manner and was chosen because it provides account of the characteristics of particular individual, group and situation.

### Sample size determinations

Sample size was determined using the formula developed by Cochran (Cochran, 1977) as shown below; Where n=desired sample size, Z= confidence level (How confident the actual mean falls within your confidence interval) 1.96 at 95% prevalence/proportion of standard deviation (How much variance is expected in the responses) 3.11/33.00 - 0.09q = 1-pd-degree of precision/ margin of error which is 5%.  $N = \frac{z^2 pq}{d^2}$   $(1.96)^2 (0.09)(1-0.09)/(0.05)^2 = 126$ . The minimum sample size needed for the study was 126.

### Study population

Study population constitute 126 children visiting sickle cell clinic of Murtala Muhammad Specialist Hospital.

### Sample technique

A total number of 126 children under 5 years were used for this study, the researcher used probability random sampling technique to extract the element used for the study

### Inclusion Criteria

Sickle cell patients of Murtala Muhammad Specialist Hospital, Kano Children under 5 years old

### Exclusion Criteria.

Age above 5 years Patient outside Murtala Muhammad Specialist Hospital

### Ethical approval and informed consent

Introduction letter was obtained from the school. Consent was obtained from the management of Murtala Muhammad Specialist Hospital Kano, as well as from the in charge of the sickle cell clinic of the hospital before the commencement of research work, all information obtained from the respondent were kept confidentially and used for the purpose of research work and the researcher ensure that no religious or ethnic bias during the collection of data.

### Materials and method

#### Anthropometric Measurements

#### Height

The participants' were asked to remove their shoes and any headwear or hair ornaments. They wear also asked to stand on the stadiometer (RGZ, 160) with their back against the measuring rod, with feet slightly apart, the trunk balanced over the waist, knees straight, arms and shoulders relaxed. The head stop was then slid down until it touched the top of the head and the head was maintained in Frankfort plane. The subject was then asked to take a deep breath so as to straighten the spine to give a consistent measurement. The measurement was read from the display to the nearest 0.1 cm.

### **Weight**

The weight was measured in kilograms using a digital weighing scale while the participant was in light clothes. The participant was asked to remove any heavy objects and take off his or her shoes and all accessories and the scale was then put on a perfectly flat surface with no

obstructions. The participant was asked to stand on the scale and remain still until the readings appear. The weight in kilogram was read to the nearest decimal place.

### **Statistical Analysis**

The data was obtained by test and retest method. Ten structured questionnaire were used for pilot study in Murtala Muhammed specialist hospital, Kano. The questionnaire was administered to the same respondents twice within 10 days and the results obtained were consistent.

### **Method for data collection**

The structured questionnaire was distributed to the marked number of respondent by the researcher, also all the 126 questionnaire duly answered by the respondent were retrieved by the researcher and were used for analysis.

### **Method of Data Analysis**

The data collected was analyzed using simple percentage and presented in frequency distribution table.

## **RESULT**

**Table 1: Descriptive statistics of the anthropometric parameters of the study population**

Variable	Minimum	Maximum	Mean ± SD
HEIGHT	55.00	110.00	79.68±11.72
HEIGHT	0.30	1.2100	0.65±0.19
WEIGHT	4.00	19.00	10.28±3.33
BMI	10.20	21.33	15.75±2.12

**Table 2: Relationship between sex and extreme temperature precipitate sickle cell crisis**

			Q1		X <sup>2</sup>	p-value
			1	2		
SEX	1	Count	44	7	0.534	0.465
		Expected Count	42.5	8.5		
	2	Count	61	14		
		Expected Count	62.5	12.5		

**Table 3: Relationship between sex and infection precipitate sickle cell crisis**

			Q2		X <sup>2</sup>	p-value
			1	2		
SEX	1	Count	37	14	0.626	0.429
		Expected Count	38.9	12.1		
	2	Count	59	16		
		Expected Count	57.1	17.9		

**Table 4: Relationship between sex and exposure to smoke (co2) precipitate sickle cell crisis**

			Q3		X <sup>2</sup> value	p-value
			1	2		
SEX	1	Count	34	17	0.577	0.448
		Expected Count	32.0	19.0		
	2	Count	42	30		
		Expected Count	47.0	28.0		

**Table 5: Relationship between sex and living in high altitude precipitate sickle cell crisis**

			Q4		X <sup>2</sup>	p-value
			1	2		
SEX	1	Count	35	16	0.289	0.591
		Expected Count	38.6	17.4		
	2	Count	48	27		
		Expected Count	49.4	25.6		

**Table 6: Relationship between sex and extreme fatigue and dehydration as a result of activity precipitate sickle cell crisis**

			Q1		X <sup>2</sup>	p-value
			1	2		
SEX	1	Count	40	11	0.046	0.831
		Expected Count	40.5	10.5		
	2	Count	60	15		
		Expected Count	59.5	15.5		

## Discussion

Majority of the respondents agreed that extreme temperature (hot or cold,) infection, travelling to or living in a high altitude, extreme fatigue and dehydration as a result of activity are the factors precipitating sickle cell crisis among under 5-years old children, while majority of the respondent disagreed that exposure to smoke (CO<sub>2</sub>) precipitate sickle cell crisis. This is in line with the view of apelike [17] who said Extremes of both hot and cold weather have been found to precipitate acute complications [18]. Anecdotally, many patients with SCD report that exposure to cold results in acute pain, usually starting within a few hours. This association is mentioned in nearly all textbooks and reviews of SCD.

## CONCLUSION

From findings of this study it is clearly seen that factors precipitating sickle cell crisis among children under 5-years old, attending sickle cell unit of Murtala Muhammad Specialist Hospital Kano are; extreme of temperature hot or cold, infections, exposure to smoke (CO<sub>2</sub>), travelling to or living in a high altitude, extreme fatigue and dehydration as a result of activity and it is also seen that avoiding sudden changes in temperature, treatment and vaccination against childhood infection, reducing exposure to smoke, avoiding travelling to or living in high altitude, keeping balance between activity and rest are very effective in reducing sickle disease.

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