

Original Research Article

Assessment of Knowledge and Attitude of Premarital Genotyping among Youths in Mairi Ward, Jere Local Government of Borno State.

Abstract

Aim: In Nigeria annually, one hundred and fifty thousand children are born with sickle cell anaemia. One way of preventing sickle cell disease is through premarital genetic counselling and screening. This study therefore assessed the knowledge and attitude premarital genotype testing among youths in Mairi ward, Jere local government of Borno State.

Methodology: The study was descriptive and cross sectional in design. Three hundred and fifty respondents were randomly selected using multistage sampling technique. Data was collected using a validated structured questionnaire that was both interview and self-administered with a Cronbach-Alpha test of 0.85. Data was analysed using the statistical package for social science (SPSS) version 21 to generate descriptive and inferential statistics. Chi-square was used to test for association between variables at alpha level of 0.05.

Result: The results showed that more than half 240 (68.6%) of the respondents were males while 110 (31.4%) of the respondents were females. One hundred and eighty-five of the respondents were between the age range of 26-30 years with the mean age of 28.5 ± 1.09 . More than half (69%) of participants were aware of premarital genotype testing and sickle cell disease however, less than half (male and female 18% and 20.4% respectively) of the respondents had good and in-depth knowledge of genotype testing and sickle cell diseases. Knowledge was significantly associated with marital status and level of education ($p=0.000$) however, there was no significant association between knowledge and occupational status ($p = 0.11$), age ($p = 0.59$), gender ($p=0.95$), or religious affiliation (0.72). There was a negative disposition of the respondents towards premarital screening of the sickle cell trait, as over 66.3% of the respondents considered the screening as unimportant public health measure and thus showed negative attitude.

Conclusion: The results of this study reflect the need for health education as a keystone in improving knowledge and attitude towards premarital screening for sickle cell disease.

Keywords: Premarital, genotyping, Knowledge, Attitude, sickle cell anaemia

Introduction

Premarital genotyping is an act of counselling testing and knowing one's genotype before getting married [1]. In Nigeria and many African countries, most children grow up without knowing what their genotype is [2][3]. This has led to an increase in the number of couples with the sickle cell trait getting married to produce children with sickle cell disease in its various forms [4]. Premarital genotyping is usually accompanied by counselling, especially for intending couples that both carry the sickle cell trait. Where both partners carry the sickle

cell trait, they have a 1 in 4 chance per pregnancy of having a child with sickle cell disease [5].

Children with sickle cell disease often experience both physical and psychological problems[6]. They often suffer severe bone pain crisis and are frequently in and out of hospital. This has been known to make some students miss federal examinations and thus repeat a year or more. Psychologically, some are depressed and frustrated with all the pain and agony they suffer in crisis. In addition, many employers, on finding out that an applicant for a job was a sickle cell disease patient will be reluctant to offer employment. They feel the individual will be unable to work effectively and will miss many working days.

According to World Health Organization[7], an average of two hundred thousand (200,000) infants are born with sickle cell anaemia in Africa yearly, with one hundred and fifty thousand (150,000) of them found in Nigeria. Nigeria accounts for about seventy five percent (75%) of infants with sickle cell cases in Africa and about eighty percent (80%) of infants' death from the disease in the continent[8]. This genetic disorder alone accounts for close to half of infant's mortality in Nigeria [9].Anecdotal observation have also shown that sickle cell anaemia accounts for about six percent (6%) of infant's death in every one hundred children born yearly in Borno State and in Mairi ward of Jere local government, Borno state, the diseases accounts for about 1.48% of infants death yearly which calls for urgent attention.

Genotype testing before marriage is the best way of preventing the occurrence of this deadly disease however;positive attitude towards this preventive measure is only predicated on awareness and in-depth knowledge of the populace[10].This study is designed to assess the awareness, level of knowledge and attitude of community youths towards premarital genotype testing in Mairi ward, Jere local government of Borno State.

Methods and Materials

Study area

A descriptive cross-sectional research design was adopted to assess the level of knowledge and attitudes of premarital genotype testing among youths in Mairi ward. The study was conducted in Mairi ward, Jere local government of Borno State which is one of the 27 local government areas of Borno State. Jere local government lies between latitude 11 degree east and latitude 10 degree east, covering an area of approximately 7850 squarekilometres. It falls within Sahel savannah zone having a flat topography with landscape dotted with tress and thorn bushes. The area has two seasons, the dry and rainy season. The hottest months are from march to June, while the cold month of harmattan are from November to February, the rainy season last from June to October with the area experiencing little rainfall. The average annual rainfall ranges from 60-95mm, most of the year is dry with high temperature ranging

74 from 30-45 degree Celsius. The exact current population of Jere L.G.A is not known
 75 however, according to the information given by the Director primary Health Care of the
 76 L.G.A, the population of the L.G.A is now 173,013 with 88182 females and 84831 males. It
 77 has a relative population growth of 2% and Mairi ward consists of 5% (8650) of the total
 78 population of the L.G.A. The population is multi-ethnic although predominantly a Kanuri
 79 speaking area, Hausa, Shuwa, Fulani, Margi, Mandara and Bura are also found. Majority of
 80 the inhabitant are Muslim with few Christians and traditionalists. There are also considerable
 81 proportion of other tribes like Igbo and Yoruba from the southern part of the country who
 82 engaged mainly on subsistence agriculture.

83 **Study population**

84 The study population included both educated and illiterate youths.

85 **Selection criteria**

86 Selection criteria for the study were: young male or female of age 16-45 years who lived in
 87 Mairi ward of the LGA for at least one month, and willing to give consent for participation in
 88 the survey.

89 **Sample size**

90 The sample size of 376 was determined using Yaro Yammane's formula - $n = \frac{N}{1 + N(e)^2}$

91 Where

92 n - sample size

93 N – finite population = 8650

94 1 – unit (constant) = 1

95 e – level of significance or limit of tolerated error = $(0.05)^2 = 0.05 \times 0.05 = 0.0025$

96 then = $8650 / 1 + 8650(0.0025)$

97 = $8650 / 1 + 22 = 23$

98 = $18650 / 23$

99 = 376

100 **Sampling technique**

A multi-stage sampling technique was adopted to select the respondents. Stage one involved the division of Mairi ward into 25 major streets; stage two was the random selection of five (20%) streets by balloting. Stage three: Houses on the selected five streets were further marked using national population house numbering and houses that were not captured in the national population house numbering were further numbered for the purpose of the research. Stage four: One hundred and eighty-eight (188) houses were selected from the five streets using systematic sampling technique, i.e. every other house. Stage Five: This involved selection of 376 respondents from the 188 selected houses. Two youth (16-45years) were selected from each house by tossing of the coin.

Data collection

Data was collected using a 23-item structured and validated questionnaire designed in line with the objectives of the study to elicit information from the respondents. The questionnaire was divided into sections A, B and C. Section A dealt with socio-demographic information of the respondents, section B was designed to elicit information on knowledge of genotype testing and sickle cell anaemia, section C assessed attitude of the respondents towards premarital genotype testing of the respondents. Twenty (20) copies of the questionnaire were pretested at Maimusari Ward on twenty (20) youths to ensure consistency and reliability of the instrument using a test retest method. The Cronbach alpha was found to be 0.85. Fifty copies of the questionnaire were interview administered to the respondents who could not read and write while 326 copies were self-administered. Out of the 326 copies of the self-administered questionnaire, only 300 copies were retrieved and analysed, together with the 50 interviewed-administered copies. Two days were used for data collection.

Data analysis

Data from the questionnaire were coded, entered into a spread sheet and analysed using SPSS version 21. Age, gender, religious affiliation, marital status, occupation and educational status of the respondents were considered independent variables that could probably influence knowledge level of premarital genotype testing among youths. Each correct answer out of 7 questions about premarital genotype testing was scored one point, while an incorrect or no response was scored zero. The points were summed up; a maximum score was 7 points. These final scores were considered the “premarital genotype testing knowledge score”. Scores were re-categorized as poor knowledge if between 0- < 50% of total, fair knowledge between ≥ 50 and < 75% and good knowledge > 75%. Descriptive data were presented in

frequency distribution tables. Means and standard deviation were calculated for continuous variables. Chi-square test of association, with p set as <0.05 was used to ascertain associations between demographic variables and level of knowledge.

Ethical clearance

The study was conducted after getting ethical clearance from University of Maiduguri Teaching Hospital. Informed verbal was obtained from the study participants after explaining the objective of the study. Confidentiality and privacy were ensured for collected information from the study participants. They were told that information given will be treated as confidential and of their right to withdraw from the study any time they wished.

Results

Table 1: Respondents' Socio-Demographic Information

Item	Frequency	Percentage
Age Range		
16-20years	55	15.7%
21-25years	75	21.4%
26-30years	185	52.9%
31 and above	35	10%
Total	350	100%
Religion		
Islam	230	65.7%
Christianity	120	34.3%
Others	0	0%
Total	350	100%
Occupational status		
Civil servant	65	18.6%
Business	135	38.6%
Students	95	27.1%
Others	55	15.7%
Total	350	100%
Sex		

Male	240	68.6%
Female	110	31.4%
Total	350	100%
Marital status		
Single	220	62.8%
Married	65	18.6%
Divorce	15	4.3%
Widow	50	14.3%
Total	350	100%
Educational status		
Primary	35	10%
Secondary	185	52.9%
Tertiary	80	22.9%
Others	50	14.2%
Total	350	100%
Tribe		
Kanuri	155	44.3%
Hausa	55	15.7%
Shuwa	65	18.6%
Others	75	21.4%
Total	350	100%

144 Table1 shows that 185 (52.9%) respondents who were the majority fall between the ages of
145 26-30 years. Mean age of respondents was 28.5 ± 1.09 years. Most of the respondents were
146 Muslim having 230(65.7%). In terms of occupational status, 135(38.6%) respondents were
147 business people, 95(27.1%) were students, 65(18.6%) were civil servants while others carried
148 55(15.7%) of the respondents. The table also shows that 240(68.6%) were males while
149 110(31.4%) were females. It was also indicated that 220(62.8%) were single, most 185
150 (52.9%) of them had attended secondary school, greater per cent 155 (44.3%) of the
151 respondents were mostly Kanuri by tribe.

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154 **Table 2: Respondent's Knowledge of Pre-Marital genotype Testing and sickle cell**
 155 **anaemia**

Item	Frequency	Percentage
Ever heard of pre-marital genotype test		
Yes	244	69.7%
No	106	30.3%
Total	350	100%
Are you aware of sickle cell anaemia		
Yes	242	69.1%
No	108	30.9%
Total	350	100%
Genotype testing prevent sickle cell anaemia		
Yes	246	70.3%
No	104	29.7%
Total	350	100%
Those mostly affected		
Male	71	20.3%
Female	83	23.7%
Both	196	56%
Total	350	100%
Mode of transmission		
Hereditary	240	68.6%
Blood transfusion	43	12.3%
Sexual intercourse	38	10.8%
Others	29	8.3%
Total	350	100%
Person with sickle Anaemia will give birth to child with the disease		
Yes	186	53.1%
No	164	46.9%
Total	350	100%
A person with Genotype AS can get married to a spouse with		

same Genotype		
Yes	203	61.2%
No	147	38.8%
Total	350	100%

Table 2 shows that, 106(30.3%) of the respondents clearly indicated that they have never heard of genotype test while 244 (69.7%) who were the majority said they have heard of it. This therefore means that there is a high level of awareness among the Mairi residents. Most of the respondents, 242(69.1%) also said they were aware of a disease called sickle cell anaemia (SCA), 246 (70.3%) of the respondents said genotype test would prevent the disease (SCA) only 104(29.7%) said it cannot. On those that are mostly affected by the disease, 196(56%) said both males and females can be affected, 240 (68.6%) of the respondents said the disease is transmitted by hereditary. 186(53.1%) respondents also said a person with sickle cell anaemia (SCA) can give birth to a child without the disease and 203(61.2%) of the respondents said that spouse of same genotype (AS) can get married while only 147 (38.8%) said no.

Table 3: Association between the knowledge and socio-demographic variables

Variable	Level of Knowledge				P value
	Poor n(%)	Fair n(%)	Good n (%)	Total	
Gender					
Male	94(39.3)	103(42.9)	43(18.0)	240	0.95
Female	43(38.8)	45(40.8)	22(20.4)	110	
Age Range					
16-20years	17(31.6)	23(42.1)	15(26.3)	55	0.59
21-25years	27(36.2)	34(44.7)	14(19.1)	75	
26-30years	79(42.9)	73(39.5)	33(17.8)	185	
31 and above	14(40.0)	18(51.4)	3(9.5)	35	
Religion					
Islam	101(43.9)	100(43.5)	29(12.6)	230	0.72
Christianity	36(30.0)	48(40.0)	36(30.0)	120	
Occupational status					
Civil servant	5(7.7)	35(53.9)	25(38.5)	65	0.11
Business	70(51.9)	50(37.0)	15(11.1)	135	
Students	39(41.1)	36(37.9)	20(21.1)	95	
Others	23(41.8)	27(49.1)	5(9.1)	55	
Marital status					

Single	109(49.6)	104(47.3)	7(3.2)	220	0.000
Married	16(24.6)	30(46.2)	19(29.2)	65	
Divorce	3(20.0)	3(20.0)	9(60.0)	15	
Widow	9(18.0)	11(22.0)	30(60.0)	50	
level of education					
Non formal	30(60.0)	17(34.0)	3(6.0)	50	0.000
Primary	21(60.0)	8(22.9)	6(17.1)	35	
Secondary	79(42.7)	98(53.0)	8(4.3)	185	
Tertiary	7(8.8)	25(31.3)	48(60.0)	80	

168 Knowledge was significantly associated with marital status and level of education ($p=0.000$)
 169 however, not significantly associated with occupational status ($p = 0.11$) age ($p = 0.59$),
 170 gender ($p=0.95$),or religious affiliation (0.72) Table 3.

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172 **Table 4: Attitude of Respondents towards Pre-Marital Genotype Testing**

Item	Frequency	Percentage
Should Youths go for pre-marital genotype testing?		
Yes	170	48.6%
No	180	51.4%
Total	350	100%
Should parents insist on genotype test before marriage?		
Yes	96	27.4%
No	254	72.6%
Total	350	100%
Would you like to do pre-marital genotype test before marriage?		
Yes	118	33.7%
No	232	66.3%
Total	350	100%
Did your Family members support pre-marital genotype test?		
Yes	99	28.3%
No	251	71.7%

Total	350	100%
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Table 3 indicates that 180 (51.4%) respondents declined that individuals intending to marry should go for genotype test before marriage while 170(48.6%) said yes. 254(72.6%) of the respondents said parents should not insists on pre-marital genotype test, also 232 (66.3%) of them said they will not do pre-marital genotype test while 118 (33.7%) said they will like to do. In terms of whether their family members do not support pre-marital genotype test or not, majority of the respondents, 251 (71.1%) said their family members support the test while only 99 (28.3%) of the respondents said they get support from their family members to do the test.

DISCUSSION OF FINDINGS

The study was designed to examine level of knowledge and attitude of premarital genotype testing among youths in Mairi ward. More than half 240 (68.6%) of the respondents were males while 110(31.4%) of the respondents were females. One hundred and eighty-five of the respondents were between the age range of 26-30 years with the mean age of 28.5 ± 1.09 . The study revealed that over(69%) of participants were aware of premarital genotype testing and sickle cell disease. These findings are similar to other published sickle cell disease studies. A study conducted by Oyewo[11] on assessment of level of the awareness of genotype test and sickle cell disease (SCD) among students of Yaba college of technology in Lagos reported that 86% of the respondents were aware of genotype testing and sickle cell diseases. Similar findings were also recorded among Babcock University Undergraduates in Lagos where 96.3% of respondents had heard of sickle cell disease and premarital genotype testing[8]. This is also comparable to the 78.9% recorded among undergraduate students in Benin, south-south Nigeria [12] and the 80% recorded among youths in Yaba, a suburban area of Lagos, south-west Nigeria [13]. It is however higher than the levels recorded in various communities in the Middle East[14][15]. The high level of awareness of the respondents in our study may be attributed to their high educational status, as over 52.9% of them had at least secondary education. It may also be attributed to the higher prevalence of sickle cell disease in Nigeria, and the fact that the respondents in our study are older, married and were already exposed to premarital screening, in the course of their getting married. This study also found more than half (68.6%) of the respondents to have answered correctly on the mode of transmission of SCD. In contrast, only 9% of the participants understood the inheritance pattern of SCD among African-American[16]. The apparent higher levels of correct responses on mode of transmission in this study indicate that individuals are aware that they could be carriers of this disease and could be at risk of producing an offspring with SCD or the sickle cell trait. This may be due to the greater attention given to this disease by the academia and religious organizations. A person with Genotype AS cannot get married to a spouse with same Genotype is a fact that was unknown to the majority (61.3%) of the respondents. This gap in knowledge needs to be adequately addressed through counselling by frontline health officers, as many cases would otherwise go undiagnosed as a result of a low index of suspicion.

It is however regrettable to note that less than half (male and female 18% and 20.4% respectively) of the respondents assessed to have good knowledge of genotype testing and sickle cell diseases, though 69.7% had heard of the disease and genotype testing. This disparity between the number of persons who are aware of a disease and those having in-depth knowledge is common among respondents in Oman [17], and makes it imperative that the focus should not just be on creating awareness of the disease, but ensuring that the depth of knowledge is such that the people can effectively participate in the testing and possibly disseminate the information to others. The lacuna in knowledge regarding premarital genotype testing in this study was noted, and should be included in health education messages for youth in this community. Similar findings have been observed in other studies on knowledge and attitude regarding premarital screening for sickle cell disease [18]. This finding has important implications for spread of the disease in communities.

This study also showed that knowledge was significantly associated with marital status and level of education ($p=0.000$). A study carried out to assess the attitude and practice of premarital counselling for Sickle Cell Disease among youth in Yaba, Nigeria found a similar picture [13]. The influence of marital status on knowledge in this study may be attributed to the fact that counselling and genotype screening exercise is made mandatory for all couples wishing to solemnize their marriage in most of the churches in the study community.

Our study also showed the negative disposition of the respondents towards premarital screening of the sickle cell trait, as over 66.3% of the respondents considered the screening as unimportant public health measure, with only 27.4% of them recommending that it should be made compulsory by all intending couples. This is comparable to the levels recorded about the government-directed screening programme in Saudi Arabia [14] and Iran [15]. This finding is however contrary to the report of Gbeneol, Brisibe, & Ordinioha [19] in south-south Nigeria. The negative attitude of the respondents in this study can be attributed to the fact that most of them are not resident in their native community, and are probably not active members of their extended families. They are therefore more likely to be unaware of the health challenges of a child with sickle cell disease, and are therefore more unfavourably disposed to preventive measures of the disease [13]. The result may also be attributed to the general opinion of some youths who usually want to go the way of love rather than having a broken relationship which is mostly tended towards their religious beliefs on miracles and destiny. Some believe that, since it is a 1 in 4 chance of having a SCD child they will rather go for just one or two children [20]. Selective termination of marriage (divorce) is another aspect that might influence the attitude of the youths in this study based on culture, as some cultural practices warrant the marriage to be called off if the woman fails to produce healthy children for her husband. Although, Nigeria is a very religious country and it was probably expected that the religion of the respondents might influence their attitude towards SCD and SCD premarital counselling.

Conclusion

This study shows that the respondent have fair in-depth knowledge of sickle cell disease and premarital screening despite their high level of awareness. More than half of the respondent

have negative disposition towards premarital screening. Marital status and level of education as independent variables were found to be significantly associated with level of knowledge. The results of this study reflect the need for health education as a keystone in improving knowledge and attitude towards premarital screening for sickle cell disease.

Recommendation

Based on the findings in this study the researchers would like to make these recommendations:

1. Health education about sickle cell disease shall be intensified community health nurses and also shall be made available for the community.
2. Premarital screening services should be made available for people in the community and shall be made affordable
3. Educational qualifications seemed to have a significant influence on the knowledge; it will be of great importance if attention is given to more public awareness and education to target the lower age group to sensitize them on SCD and premarital counselling before they reach the age of marriage. This effort should also be increased in the rural areas where we are most likely to find more people with only primary school education. Therefore, all stake holders such as the media, non-governmental organizations, religious bodies, hospitals, schools and community leaders should continue on their sensitization process on SCD premarital counselling by seeking for means to communicate with those with only primary school education in the language they will best understand and even to those who can't read or write.

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