PREVENTION OF SICKLE CELL DISEASE BY PRENATAL DIAGNOSIS-OPINION OF FEMALE HEALTH WORKERS IN OSOGBO, SOUTH WESTERN NIGERIA.

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ABSTRACT:

Background: Sickle cell disease has remained one of the commonest genetic haematological disorders which could be successfully managed by prenatal diagnosis if adequately utilized. Since female health workers would most likely witness the various complications associated with this condition and being women that are directly involved in child birth and caring, there is thus a need to assess the influence of their exposure on the willingness to accept this preventive measure.

Methodology: Structured questionnaires were administered to female health workers of Ladoke Akintola University of Technology Teaching Hospital, Osogbo, Nigeria.

Result: One hundred and seventy six respondents were obtained. A significant proportion of the respondents, 83(47.2%), did not accept termination of pregnancy in first trimester after confirmation by prenatal diagnosis, 38(21.6%) were undecided while only 53(31.3%) agreed. Only 21 (11.9%) of the respondents knew that facilities for prenatal diagnosis are available in Nigeria.

Conclusion: Despite the fact that these female health workers are aware of inherent dangers of sickle cell disease, there is strong opposition to use of prenatal diagnosis in preventive measure, thus aggressive genetic counseling remains the only realistic option.

Key words: Prenatal Diagnosis, Sickle Cell Disease, and Female Health workers

INTRODUCTION

Sickle cell anaemia (SCA) is the commonest genetic blood disorder of epidemiological importance among Blacks of African extraction. The disorder is uniformly distributed among the various ethnic groups in Nigeria with a prevalence of 1-3% and an annual incidence of about 80,000 [1,2] . The prevalence of the carrier state (HbA + S) is as high as 26% [3,4]. Sickle cell anaemia is associated with high morbidity and mortality, especially in childhood and in pregnancy [5,6,7]. There is no cure for the disease, however, bone marrow transplantation therapy which appears promising is only safe for younger patients with little or no serious complications [8] but the high cost of the procedure, coupled with its potentially lethal complications, are strong limitations to its general use and acceptance in developing countries [9].

Prenatal diagnosis (PND) for SCA followed by elective termination of affected pregnancies if the parent(s) so desire, appears to be a more reliable means of controlling the disease [10.] Prenatal diagnosis of SCA and other haemoglobinopathies has been simplified by the introduction of fetal DNA analysis from the chorionic villi [11] .This is based on the application of polymerase chain reaction (PCR) with DdeI restriction analysis and dot-blotting with allele-specific oligonucleotides (ASO)[12] and the technique is based on the ligation assay coupled with automated capillary fluorescence detection which allows the diagnosis of both Hgb S and Hgb C to be available in a few hours in the first trimester.[13]

The feasibility of early diagnosis at 8-10 weeks of gestation, the simplicity of the procedure and low fetal wastage (usually <1%) have made chorionic villus sampling more acceptable to most women than are the older direct fetal blood sampling and amniocentesis techniques, normally performed during the second trimester of pregnancy[14]

The aim of this study was to examine the awareness and attitude of health professionals in Osogbo, South Western Nigeria towards prenatal diagnosis and its use in the prevention of sickle cell disease.

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MATERIALS AND METHOD

Structured questionnaires were administered to various cadres of female health workers of reproductive age group at Ladoke Akintola University of Technology Teaching Hospital, Osogbo, South Western Nigeria, after explanation on the purpose of the study and verbal consent was obtained. Ethical approval of the institution was also obtained. A total number of 176 responses were obtained. Descriptive analysis was done and chi-square test was also done where appropriate.

RESULTS

Mean age of the respondents was 31.3±5.2years. Fifty seven (32.4) of the respondents were singles while 119(67.6) were married. One hundred and fifty three (86.9) were Christians and 23(13.1) practice Islamic religion. Fourteen (8.0%) were doctors, 97(55.1%) nurses, 14(8.0%) laboratory scientists, 14(8.0%) medical record officers, 21(11.9%) hospital maids/orderlies,8(4.5%) hospital administrative staff and other professions were 8(4.5%).

One hundred and sixty nine (92.2%) knew their haemoglobin genotype while eight (8%) were not aware. Of those who knew their haemoglobin genotype, 109 (61.1%) were AA, 39 (24.1%) AS, 2 (1.2%) SS, 2 (1.2%) SC and 10 (6.2%) were AC.

Majority of the respondents 103 (58.5%) had not

Table 1 Socio-demographic Factors

Variable	Number	Percentage
Marital Status		
Married	119	67.6
Single	57	32.7
Religion		
Christianity	153	86.9
Islam	23	13.1
Profession		
Doctors	14	8.0
Nurses	97	55.1
Lab Scientists	14	8.0
Medical Records	14	8.0
Hospital Maids / Orderlies	8	4.5
Others	8	4.5

heard about prenatal diagnosis. One hundred and sixty six (94.3%) were able to state correctly how the disease is acquired while 10(5.7%) could not and a significant number of them, 169(96.0%) agreed that intending couples should know their haemoglobin genotype before marriage, 5(2.8%) disagreed while 2(1.1%) were not sure.

Table 2 Responses to preventive termination of pregnancy by profession

Variables	Yes No(%)	No No(%)	Not Sure No(%)
Doctor	3(21.4)	8(57.1)	3(21.4)
Nursing	31(32.0)	46(47.3)	20(20.6)
Lab Scientist	2(14.3)	9(64.3)	3(21.4)
Medical records	6(42.9)	(28.6)	4(28.6)
Hospital Maids/Orderlies	8(38.1)	13(61.9)	-
Administrative Staff	4(50.0)	1(2.5)	3(37.5)
Other staff	1(12.5)	2(25.0)	5(62.5)

1. $X^2 = 22.52, df = 12, p = 0.032$

Table 3: Knowledge of where Prenatal diagnosis of Sickle cell Disease is obtained in Nigeria by marital status

Variable	Yes No(%)	No No(%)
Single	11(19.3)	46(80.7)
Married	10(8.4)	109(91.6)

$X^2 = 4.35, df = 1, p = 0.037$

A significant number of the respondents 83(47.2%) did not accept termination of pregnancy in first trimester after confirmation by prenatal diagnosis, 38(21.6%) were undecided while only 53(31.3%) agreed. There was a significant association between the professional groups and rejection of termination of pregnancy; highest among the laboratory scientists 9(64.3%) and hospital maids/orderlies 13(61.9%), $\chi^2 = 22.52, p=0.032$. (Table 2), there was no significant association with marital status and religion, p = 0.634 and 0.308 respectively.

Only 21 (11.9%) of the respondents knew that facilities for prenatal diagnosis are available in Nigeria while 155 (88.1%) did not. Of those that were not aware of this facility, 109 (91.6%), were married while 46 (80.7%) were singles which is statistically significant; $\chi^2 = 4.35, p=0.037$. Table 3

DISCUSSION

Majority of the respondents (92.2%) knew their haemoglobin genotype. This is slightly higher than that (77.1%) obtained in a similar study done in the

Northern part of the country, though medical students were not included in this study[15].

Of those who knew their haemoglobin genotype, the distribution of the various types of haemoglobin genotype is similar to distribution in the general populace. Our study has shown a lower proportion, 41.5%, of those aware of prenatal diagnosis compared to 77.1% of awareness in similar study in the Northern part of the country[15]. However, majority, 88.1%, were unaware of the availability of Prenatal diagnostic facilities in the country as was the case with the study in the Northern part of the country[15]. The proportion of those that were unaware of where Prenatal diagnosis could be obtained in Nigeria was greater among the married compared to the singles, $p < 0.05$. The knowledge on the mode of transmission of the disease in this study -94.3% was better than what is reported for the general population[16]. Majority of respondents 47.3% did not accept termination of pregnancy after confirmation of the disease by prenatal diagnosis, 21.6% were undecided while only 31.3% only agreed. This may be due to the effect of education and the general disapproval of abortion in whatever guise as reported in other studies in the country[15]. Most respondents, 96.0%, however, agreed that intending couples should know their haemoglobin genotype before marriage. This at least opens a vista of opportunity for genetic counseling and should be utilized as a first line for the prevention of sickle cell disease.

In conclusion, despite the fact that these group of people studied, the female health workers, ought to be more exposed to the burden of sickle cell disease and be well informed more than the general population, they are still opposed to the use of prenatal diagnosis in prevention of sickle cell disease. Genetic counseling may be the best initial option in the primary prevention of sickle cell disease. Aggressive enlightenment of health professionals as well as the review of the restrictive abortion laws in Nigeria would go a long way in tackling the problem of sickle cell disease in the country.

REFERENCES

1. Akinyanju O. O. A Profile of Sickle Cell Disease in Nigeria. Ann. N. York Acad. Sci. 1989; 565, 126.

2. Oyediji G. A. The effect of Sickle Cell Disease on the Families of Affected Children (letter). Central Afr Med J 1995; 41(10): 333-334

3. Esan G. J. F. The Thalassaemic Syndromes in Nigeria. Br. J. Haematol. 1970;19: 47.

4. Fleming A. F., Storey J., Molineux L., Iroko E. A.Attai E. D. E. Abnormal Haemoglobins in Sudan Savana of Nigeria. Ann. Trop. Parasitol. 1979; 73, 161.

5. Luzzatto L. Sickle Cell Anaemia in the Tropical Africa. Clin. Haematol. 1979; 10. 757.

6. Fleming A. F (Ed.) Sickle Cell Disease. A Handbook for the General Clinician. Churchill Livingstone, London, 1982.

7. Ogedengbe OK, Akinyanju O. The Pattern of Sickle Cell Disease in Pregnancy in Lagos, Nigeria. West Afr J Med. 1993; 12(2):96-100

8. Sergio P. Bone marrow transplantation in sickle cell disease: a plea for a rational approach. Bone Marrow Transplantation . 1992; 10: 58.

9. Johnson F. Marrow Transplantation for Sickle Cell Disease: U.S. Experience. Abstract. Bone Marrow Trans-plantation for Haemoglobinopathies Workshop, Holiday Inn, Bethesda, U.S.A. p. 12.

10. Model B. Progress with thalassaemia. Med. Digest.1982; 8: 16.

11. Old J. M. and Fitches A. First trimester fetal diagnosis for haemoglobinopathies: report on 200 cases. Lancet.1986; 2:763.

12 Wang X, Seaman C, Paik M, Chen T, Bank A, Piomelli S. Experience with 500 prenatal diagnoses of sickle cell diseases: the effect of gestational age on affected pregnancy outcome: Prenat Diagn. 1994; 14(9):851-7

1. Day NS, Tadin M, Christiano AM, Lanzano P, Piomelli S, Brown S. Rapid prenatal diagnosis of sickle cell diseases using oligonucleotide ligation assay coupled with laser-induced capillary fluorescence detection. Prenat Diagn. 2002; 22(8):686-91.

14. Kagu MB, Abjah UA, Ahmed SG. Awareness and acceptability of prenatal diagnosis of sickle cell anaemia among health professionals and students in North Eastern Nigeria. Niger J Med. 2004; 13(1):48-51.

15. Durosinmi MA, Odebiyi AI, Adediran IA, Akinola NO
Acceptability of prenatal diagnosis of sickle cell anaemia (SCA) by female patients and parents of SCA patients in Nigeria. Soc. Sci. Med. 1995; 41(3):433-6.