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KNOWLEDGE, ATTITUDE AND USE OF HYDROXUYREA AMONG ADULT SICKLE CELL DISEASE PATIENTS

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ABSTRACT

Introduction: **Hydroxyurea is the only cytotoxic drug approved for use in the care of sickle cell disease patients. It has been found to be effective in fixed low dose in low resource economy where the cost of the drug and frequent monitoring may be a barrier. This study looked at the knowledge, attitude and use of hydroxyurea in a low resource country with a high burden of the disease.**

Methods: **Data was obtained using a self-administered questionnaire in 101 consecutive adult sickle cell disease patients in a tertiary health care facility.**

Results: **All the patients responded to the questionnaire, majority (67%) of the respondents were below 40years with equal numbers of male and female patients. Of the respondents, 15.5% have ≥ 3 painful crises in a year. Half of the respondents were not admitted in the preceding year with 6 (5.9%) of them having had ≥3 admissions. Less than a quarter (21.2%) had knowledge of hydroxyurea, but 52.5% were willing to use the drug while 4.3% had previously or are currently using it. Only 11 respondents were aware of the side effects and the information was mostly through their Physicians. Those willing to use the drug were also willing to attend follow-up clinic monthly.**

Conclusion: **Though the awareness about hydroxyurea is low in our group of patients, many are willing to use the medication and attend follow up clinics. There is a need to create more awareness about the drug especially by Physicians who care for the patients.**

Keywords: Attitude, Hydroxyurea, Knowledge, Sickle cell disease, Low-income-country

INTRODUCTION

Sickle cell disease (SCD) is an inherited chronic hemolytic anaemia associated with recurrent painful episodes. It is 'one of the most commonly inherited diseases world-wide with over 250,000 new births each year'.[1] The most prevalent is sickle cell anaemia, the homozygote (HbSS) state. Patients with this disorder have a chronic hemolytic anemia, but the rates of the most common acute vaso-occlusive events vary considerably. High crisis rates are associated with high haematocrit and low fetal hemoglobin levels, hence efforts are geared towards increasing the fetal hemoglobin level.[2,3]

Hydroxyurea (HU) is one of the few approved disease-modifying medication in the treatment of SCD. HU therapy has been shown to ameliorate the severity of the disease in SCA, mainly by inducing HbF production.[3] There is evidence that escalation of the dose of HU to the maximum tolerated dose (MTD) significantly increases HbF levels yielding a good clinical response.[4] Mortality and morbidity rates in sickle cell disease (SCD) have been considerably reduced since the introduction of HU in populations where it is used.[5,6]

It is therefore surprising that the degree to which HU is used in our hospital is low, despite being the foremost tertiary hospital in Nigeria where SCA affects 2-3% of the population. This study aims to determine the level of awareness of HU therapy and the willingness of the patients to commence its use.

METHODS

This is a cross-sectional study carried out among sickle cell disease patients attending an adult Haematology outpatient clinic of a tertiary institution. Data were collected from 101 consecutive patients using a self-administered questionnaire. The data collected included socio-demographic characteristics of the study participants, their knowledge and attitude towards use of hydroxyurea. The collected data was coded and analyzed with SPSS version 22. The responses were recorded in proportions and a bivariate analysis of the knowledge, interest and use of hydroxyurea was done using Pearson's chi square test.

RESULTS

One hundred and one patients responded to the questionnaire. Majority (67%) of which were below 40 years and mostly (66%) single (Table 1). The gender was balanced with a male to female ratio of 1:1.

Table 1: Sociodemographic characteristics of respondents

Variables	n(%)
Age	
14-25	47(48.4)
31-35	31(32.0)
36-45	12(12.4)
46-55	4(4.1)
56-65	3(3.1)
Sex	
Male	49(48.5)
Female	51(50.5)
Educational status	
No formal education	1(1)
Primary education	0(0)
Secondary education	25(24.8)
Tertiary education	70(69.3)
Marital status	
Single	66(65.3)
Married	32(31.7)
Divorced	1(1)
Separated	1(1)

Over 70% have achieved tertiary education and only 1% had no formal education (Table 1). Only 15.5% of the respondents have more than 3 crises per year with the majority (60.2%) having less than 1 crisis per year. Half of the respondents were not admitted in the preceding year with 6 (5.9%) of them having had ≥3 admissions.

Less than a quarter of the patients were aware of hydroxyurea (Table 2) while only four have taken HU or had HbF quantitation done. Among those who had knowledge about HU, only 11 are aware of the side effects and their source of information was from medical personnel. Despite the poor knowledge about HU and its side effect, more than half are willing to take the drug. Three respondent would not want to use the drug because of its cancer related complications. Majority (67%) of those interested in HU use would not mind having monthly complete blood counts and clinic appointments. Bivariate analysis of the knowledge, interest and use of the drug showed that interest had more impact on its use than knowledge about the drug (knowledge vs use; X^2=11.2, P=0.001; interest vs use; X^2=64.9, P<0.001). However, it should be noted that knowledge and interest may have effect on each other (X^2=29.7, P<0.001).

Table 2: Descriptive characteristics of knowledge and use of hydroxyurea by sickle cell disease patients in an adult clinic

	Frequency	Percent
Knowledge about Hydroxyurea (99)		
Yes	21	21.2
No	78	78.8
Interest in the use of Hydroxyurea (101)		
Yes	53	52.5
No	35	34.7
Not sure	13	12.9
Those who had ever used Hydroxyurea (92)		
Yes	4	4.3
No	88	95.7

DISCUSSION

This study evaluated the knowledge and attitude towards use of HU among adult sickle cell patients. It was observed that though less than a quarter have knowledge of hydroxyurea, more than half are willing to use the medication showing its great potential among our patients. Also, most of them have no knowledge of HU despite having tertiary education. Educational attainment therefore had no bearing on whether respondents have good knowledge of HU use in SCD, considering the fact that over 70% had tertiary education. This is interesting because the level of education is expected to correlate with the knowledge but this is not so in this survey. This might suggest a poor knowledge seeking behavior among the patients. Most of the respondents who are aware of HU therapy got their information from medical personnel, which showed that medical personnel would be a good source of dissemination of information about the drug. This would therefore suggest that lack of such information by the majority of the patients is because Physicians have not discussed the possibility of the therapy with them. To ensure that patients are up to date especially in a low income setting, where many people are not sufficiently knowledgeable about the use of the internet in the acquisition of information, attending Physicians should bring available treatment options to the patients. It may therefore be worthwhile to seek the attitude of the Physicians to the use of HU in SCD. The use of the drug was better in another Nigerian study where about a third of the patients were current users while 60% had never used the drug and only four patients consistently used the drug.[7]

Majority of our respondents except for a few had not had HbF quantitation done before which could be due to the financial implication of the test or could be as a result of non-availability of the test facility. Making HbF quantitation readily available in centres with a high SCD patient population should be mandatory. This is especially because it is a necessary pre-requisite to the commencement and monitoring

of response to HU therapy. Quantitation of HbF by HPLC should therefore not be solely for research as it is done in many resource poor countries.

More than half of the respondents indicated interest in the use of HU but it is not known whether the interest shown was because they are not fully aware of its possible side effects. It could also be that many of the respondents are so overwhelmed by the disease and its complications that they would readily accept any new modality of treatment. Of those who did not show any interest in the use of HU, the fear of cancer related complications was a contributing factor.

The knowledge of the side effects is particularly important for SCD patients in whom it is used prophylactically. Early detection and prompt treatment of side effects such as myelosuppression is therefore important. Other possible side effects of HU use like hair loss, skin rash, gastrointestinal disturbances and potential likelihood of teratogenicity and carcinogenesis are equally important and should be discussed with patients before the commencement of therapy. Though the likelihood of teratogenicity or carcinogenesis have not been validated as long term follow up of people taking HU among SCD cohort or for other diseases have not shown significant increase in malignancies.[4,6,8] However, the remote possibility of this occurring should still be discussed with patients. Safety of HU in pregnancy is not clear yet though babies born to patients on HU have showed no evidence of birth defects or developmental defects, it is highly recommended that patients on HU should avoid pregnancy.[6,8]

Patients with >3 crises or admissions per year are recommended for HU therapy[4,8], this would mean that only about 15% of the patient population would be considered for HU therapy in our setting. Most eligible patients are not currently on HU therapy, this can be attributed to provider associated barriers, perceived risks of HU use or lack of awareness.[7,9] Financial implications of the daily use of HU might also be a barrier in a low resource country.[10,11] Low fixed dose which has been found to be efficacious, safe and pragmatic in low resource countries[11,12,13,] may therefore be an option.

The shortcoming of this study is that a validated instrument was not employed in assessing the study participants. Also, we did not explore the role of sociodemographic characteristics on the knowledge, attitude and use of the drug by the participants.

CONCLUSION

Many patients with sickle cell disease would benefit from HU therapy in ameliorating the disease process and complications. It is therefore imperative that the level of awareness and use of HU could be increased by providing leaflets and other educational aids to the patients. Provider associated barriers may also pose a problem to the commencement of HU use and therefore providers should be equipped with enabling facility for the commencement and monitoring of SCD patients on HU.

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