Haematology day care service for adult sickle cell disease patients

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Abstract

Background: Non communicable diseases have overtaken infectious diseases as a cause of death in resource poor countries, making it necessary to introduce interventions and management policies in their control. Sickle Cell Disease (SCD) is a prevalent disorder in this category. This survey evaluated the use of a day care facility in the care of SCD patients in Nigeria.

Methods: This is a questionnaire based, cross-sectional survey carried out in tertiary hospitals in Nigeria. Information obtained included number of patients per week with vaso-occlussive crises (VOC), blood transfusion and hospital admissions through the haematology day care unit (HDCU) or Emergency Room(ER). Also obtained were the number of sickle cell deaths in the preceding year and the use of hydroxyurea by the patients.

Results: Eight (61.5%) of the thirteen hospitals have HDCU and such hospitals were less likely to transfuse patients in the ER (OR=0.5). Admissions through the ER also differ between hospitals with and without HDCU 1.75 vs 2.4 respectively (p=0.2). Sickle cell deaths did not differ between the two groups (X^2=3.6; p=0.46). Experience per consultant year differed between teaching and non-teaching hospitals (p=0.02), teaching and state hospitals (p=0.09).

Conclusions: This survey showed that hospitals without HDCU are more likely to use the ER for the care of SCD patients where care for the patients may not be optimal. It is important for countries with a high disease burden to consider HDCU as a suitable intervention in optimizing SCD care.

Keywords: *Hospital services; Intervention; Sickle cell death; Vaso-occlussive crises; Hydroxyurea; Haematologist*

Résumé

Contexte: Les maladies non transmissibles ont surpassé les maladies infectieuses en tant que cause de décès dans les pays pauvres en ressources, rendant nécessaire la mise en place d'interventions et de politiques de gestion dans leur contrôle. La drépanocytose (MCS) est un trouble répandu dans cette catégorie. Cette enquête a évalué l'utilisation d'un établissement de soins de jour dans le traitement des patients atteints de MCS au Nigeria.

Méthodes: Il s'agit d'une enquête transversale basée sur un questionnaire et réalisée dans des hôpitaux tertiaires au Nigeria. Les informations obtenues incluaient le nombre de patients par semaine présentant avec des crises vaso-occlusives (CVO), des transfusions sanguines et des hospitalisations via l'unité de soins de jour hématologique (USJH) ou la salle d'urgence (SU). On a également obtenu le nombre de décès dus à la drépanocytose au cours de l'année précédente et l'utilisation d'hydroxy urée par les patients.

Résultats: Huit (61,5%) des treize hôpitaux sont dotés d'un USJH et ces hôpitaux étaient moins susceptibles de transfuser des patients à l'urgence (OR = 0,5). Les admissions aux urgences diffèrent également entre les hôpitaux avec et sans USJH 1,75 vs 2,4 respectivement (p = 0,2). Les décès dus à la drépanocytose ne différaient pas entre les deux groupes (X^2 = 3,6; p = 0,46). L'expérience par année de consultant diffère entre les hôpitaux universitaires et non universitaires (p = 0,02), les hôpitaux universitaires et les hôpitaux publics (p = 0,09).

Conclusions: Cette enquête a montré que les hôpitaux sans USJH sont plus susceptibles d'utiliser l'urgence pour les soins des patients atteints de MCS, où la prise en charge des patients peut ne pas être optimale. Il est important que les pays fortement touchés par la maladie considèrent l'USJH comme une intervention appropriée pour optimiser les soins de la MCS.

Mots clés: *Services hospitaliers; Intervention; La mort due à la drépanocytose; Crises vaso-occlusales ; L'hydroxy urée ; Hématologue*

Introduction

The epidemiological history of sickle cell disease (SCD) in Nigeria is changing for the better with more patients surviving to adulthood and the reproductive age [1,2]. However, it is believed that the global burden of the disease will increase because of this improved survival with Nigeria becoming the country most in need of interventions and management policies [3]. Interventions like

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vaccination against Streptococcus pneumoniae and Haemophilus influenzae infections have recently been incorporated into the National Immunization Programme while prophylaxis against malaria and the daily use of folic acid have long been practiced. Another age long practice is the use of a day care facility, a practice that was likely borrowed from the care of sickle cell patients in Jamaica [4]. Unfortunately, most of these interventions have never been evaluated, it is important to evaluate these interventions to assess their benefits and cost effectiveness.

Sickle cell painful crises are not only recurrent but are unpredictable necessitating that they are attended to promptly and this is possible in either the medical emergency department or in a day care facility. Timely intervention is not only useful in the management of painful episodes but also for the management of severe anaemia with blood transfusion or in the urgent treatment of infections, all of which could prevent mortality and reduce morbidity. However, there could be delay in responding to the medical needs of SCD patients in a busy emergency unit, hence the need for a day care unit. The day care unit not only attends to walk-in patients but also transfer patients from the emergency room i.e. patients seen there after the working hours of the day care unit [5]. In Nigeria, day care service is used in the provision of care for sickle cell disease patients and patients with other haematological disorders. This survey was carried out to determine how common the use of haematology day care services is in the country and its bearings on the care of SCD patients.

Methods

This is a descriptive, cross sectional, questionnaire based survey using a list of hospitals with qualified haematologist. Each haematologist contacted per hospital was invited to partake in the survey which was sent by e-mail. A reminder email was sent monthly on two other occasions with the same questionnaire attached. If no response was received after this third contact, it was taken that the haematologist was not interested in responding to the survey. The survey was carried out between April and September 2015.

The questionnaire was semi-structured to find out about the presence of a Haematology Day Care Unit (HDCU) and an emergency department. Information obtained included the average number of adult sickle cell disease patients treated per week for vaso-occlusive crises (VOC) or blood transfusion, the number admitted to the wards through either of these facilities, the number of deaths in the previous year in the various hospitals. The use of hydroxyurea by the patients was also assessed. The information obtained was compared between those with and without HDCU. Information was also sought about the category of each hospital, whether teaching or non- teaching and whether federal or state along with the number of bed spaces and the years of experience of the attending haematologists. Since the years of experience of each haematologist and the number of haematologists vary between the institutions, an aggregate was computed by multiplying the number of years of experience of each haematologist by the number of haematologists to give the experience per consultant years for each hospital.

A comparison of the mean of each parameter between hospitals with and those without HDCU and between Teaching and Non-Teaching hospitals was made using Student's t test, the confidence interval and a two tailed p value were reported. Chi square test was used to compare mortality between hospitals with or without HDCU and between Teaching and Non-teaching hospitals. Odds ratio with confidence interval was used in comparing the likelihood of blood transfusion in the emergency room. A p value of 0.05 was taken as significant for the t test while an odd ratio not including 1 was taken as significant.

Results

There were 13 responses from the 21 hospitals contacted giving a response rate of 61.9%. There was a better response from the Teaching Hospitals compared to the Federal Medical Centres (FMCs) (76.9% vs 20%).

Table 1: Distribution of facilities across the different levels of hospitals

Level of Hospital	No. of Hospitals (%)	Average No. with Day care	Average No. of Beds in the Day care	Average No. of Consultants per hospital	Experience per Consultants years	Average No. of hospital bed spaces
Federal Teaching	7 (54)	6	4	4.5	73.6	551
State Teaching	3 (23)	2	3	2.7	37.3	530
Others*	3 (23)	0	0	3	30.8	393

One each of Federal Medical Centre, State Hospital and Non-Teaching Tertiary Hospital

Description of surveyed hospitals (Table 1)
Majority of the hospitals that responded were Federal Teaching hospitals (54%), and the number of consultant haematologists in the various hospitals varied between two and eleven with a mean of five consultants per hospital. Federal teaching hospitals are more likely to have more haematologists than non-teaching and/or non-federal hospitals (5.4 vs 2.8, p=0.08). All the hospitals surveyed have an emergency medicine department and hold regular weekly haematology outpatients' clinic during which SCD patients are seen. One of the hospitals holds this outpatients' clinic thrice in a week while another holds its clinic twice in a week and the others hold the clinic only once a week. The number of bed spaces in the hospitals range between 250- 800 with a mean of 506±155.6.

admitted to the ward per week for VOC through the HDCU and at least one patient was transfused with blood per week in the HDCU. One to two patients are admitted through the HDCU every week for other reasons apart from VOC or blood transfusion (table 2).

Care provided through the accident and emergency units
All the hospitals recorded seeing one patient on the average in the emergency room for VOC in a week, only one hospital without a day care unit sees an average of two patients in a week, this hospital also runs outpatients' clinics thrice a week. On the average, blood transfusion is given in the emergency units 1-2 times a week to SCD patients and hospitals without HDCU are more likely to transfuse patients

Table 2: Reasons and average number of patients seen per week by the various day care units.

Number of Patients	Vaso-occlussive crises	Blood transfusion	Admissions
>3	2	0	0
1-3	4	4	5
<1	2	4	3

Table 3: Comparisons of facilities, consultants' experience and admissions between hospitals with and without day care unit

	Those with day care facilities (Mean±SD)	Those without day care facilities (Mean; SD)	95%CI	P value
Number of hospitals	8	5		
Average Number of Consultants	4.9±2.6	3.2±1.3	-1.08-4.48	0.2
Average Experience per Consultant years	65.9±33.2	38.4±22.0	-9.67-64.67	0.13
Average number of bed spaces	580±134.4	387.8±112.4	33.04-351.36	0.02
Average number of total admissions per week	3.6±0.9	3.8±0.8	-1.29-0.89	0.7
Average admissions through ER per week	1.6±0.8	2.4±1.3	-2.06-0.47	0.2

ER: Emergency Room

Description of care provided by the Day Care units
Eight of the thirteen hospitals have an HDCU (62%), of which six are in the Federal teaching hospitals. Four (50%) of the units have been established for over 10yrs while three (37.5%) were established between 6-10yrs ago and one (12.5%) was established less than two years ago, these units have between three to five beds. Patients seen in the various day care units varied between less than one to seven in a week while on the average one patient is

in the emergency unit than those with one. Hospitals with an HDCU are three times more likely to transfuse patients only once a week in the emergency unit compared to hospitals without HDCU (OR;95%CI=0.5;0.05-5.5) who are likely to transfuse patients twice a week in the emergency room (OR;95%CI=4.5;0.41-49.6). On the average, admissions per week through the emergency room were 1.75 vs 2.4 (p=0.2) for hospitals with and without HDCU respectively (table 3)

Mortality

The number of sickle cell deaths recorded in the year preceding the survey did not differ between those with and without an HDCU (X^2=3.6; p=0.46). Also, recorded death did not differ between teaching hospitals and other hospitals, an aggregate of thirteen deaths were recorded by the ten teaching hospitals in the last one year while the three non-teaching hospitals recorded four deaths (X^2=6.1;p=0.19).

Experience of the Consultant Haematologists

The experience per consultant years was not significantly different between hospitals with or without HDCU (p=0.13). However, the experience per consultant years differed between Teaching and Non-Teaching hospitals (73.6 vs 34.1; p= 0.02) and between Federal Teaching hospitals and State owned Teaching hospitals (73.6 vs 37.3; p= 0.09). The experience per consultant years was similar between State Teaching hospital and other Non-Teaching hospitals (37.3 vs 30.8; p= 0.65) (table 1).

The use of hydroxyurea

All responses on the use of hydroxyurea by the patients were negative except in one hospital.

Discussion

This survey shows that care delivery to SCD patients differed between hospitals with a Day Care unit and those without one. Hospitals without an HDCU are more likely to rely on the emergency room services for the care of the patients, be it for management of painful crises or blood transfusion. Also, the total number of patients admitted unto the wards also differed between hospitals with an HDCU and those without, with hospitals without day care services being more likely to admit patients for care on the wards than those with one. Similarly, experience per consultant years differed between the two groups. Though, these differences were not statistically significant. However, mortality was found to be similar between the two groups, mortality was also unaffected by the level of the hospital i.e. whether it is a teaching hospital or not. The larger a hospital is, the more likely are they to have a day care facility (p=0.02).

Nigeria has 24 teaching hospitals, 14 (58.3%) being Federal institutions and 22 Federal Medical Centres (non-teaching tertiary hospitals). There are about 70 Haematologists in the country, majority of whom work in the Teaching hospitals or the FMCs. The response rate and the distribution of the participating institutions showed a fair spread (Table 1), though there appeared to be a selection bias in favour of the Federal Teaching hospitals. The bias may not be unconnected to the fact that the FMCs are less likely to have a day care facility, which may also be a reason why some of the teaching hospitals did not respond to the questionnaire. The poor response rate from hospitals that are less likely to have a day care unit (FMCs) may therefore account for the non-statistically significant difference of most of the test parameters between both groups.

There are no definite records of how many SCD patients are in the country because of poor record keeping, extrapolations are therefore usually made from prevalence studies, which may also differ based on the population studied. The prevalence of SCD in the country is 3-4% [6,7], and a recent survey of clinics based in some Nigerian hospitals showed that there are between 15-11000 patients in the various hospitals that took part in the survey [8]. Though information about the patient population was not sought for in our survey, it does appear that the patient traffic is light with the busiest hospital seeing an average of one patient a day and an average of four patients admitted for care every week in the various hospitals. This may be because 25% of Nigerian SCD patients rarely have painful crises and only half have up to three painful episodes in a year, also about a quarter have never been transfused [1]. It could also be because many of the patients seek health care in hospitals where there are no Haematologists. This would suggest the need for government to provide specialist care for these patients in all tiers of health care facilities. This could be done by making medical practice in non-teaching hospitals attractive to specialist doctors and also by providing sandwich training in the care of SCD patients for low cadre doctors who can man primary health care centres.

This survey shows that hospitals with day care units are more likely to make use of it than the emergency rooms in the care of SCD patients. Care of SCD patients in the emergency room has been shown to be suboptimal because of the heavy patient load and the varied nature of patients seen there [4,5]. A dedicated centre with staff that with time will become familiar with the medical and psychosocial needs of the patients would be more advantageous. With the high burden of SCD in the country it is recommended that all tertiary institutions should have a 5-10 beds space day care units while other government hospitals should have a 3-5 beds space for day care of SCD patients. The current average beds space of 3 may not be adequate especially since this is also shared by patients with other haematological disorders; care for the patients in the

emergency rooms should therefore be used only when the HDCU is closed [5]. It was also observed that one of the Teaching hospitals without a day care unit runs outpatients' clinics thrice a week which may be a way to compensate for the lack of a day care service. This practice is not recommended since this would unnecessarily increase the work load of the physicians.

The record of one death per hospital per year may not represent the true mortality rate because of underreporting by the participating hospitals. Also, autopsies done on SCD patients in a tertiary hospital in the country showed that 52 autopsies were done over a 17-year period (9) though this is not restricted to adult patients. The authors pointed out that this also may not be representative of the death rate in the hospital because of the high decline rate for autopsies and an equally high rate of unrecorded death. There is need for an accurate data on mortality in SCD patients in the country despite all the challenges, if appropriate interventions are to be used in controlling the disease.

Though the use of hydroxyurea by the patients was not the primary objective of the survey, the low rate of hydroxyurea use by the patient is not surprising. It is estimated that not more than 1% of African SCD patients use this drug possibly because of cost [8, 10]. A comparison of patients with SCD from Nigeria and those from the USA also showed less frequent use of hydroxyurea in the Nigerian patient population [11]. Hydroxyurea appears to be used more frequently in paediatric patients where it is used more often in patients with a high risk of stroke; even in this setting more than half of the population at risk still decline to use it [12]. Reason for decline may be attributable to being unable to afford the drug since those who decline use are also more likely to drop out from school. It is however necessary to ascertain that the lack of frequent use of this drug is because of reason of cost alone, attitudes of both the patients and their primary physicians to the use of the drug should also be explored.

The applicability of the use of day care facility may be limited to populations with high SCD disease burden because of cost effectiveness, though other settings may consider adopting the practice after weighing the benefits against the cost. The applicability of the practice in paediatric patients is also worth considering; this would however need evaluation by paediatricians. This is because of the differences in the physiology and haemodynamics of paediatric patients especially since paediatric patients are more likely to be kept under observation for over 24hrs after treatment for painful crises or following blood transfusion.

This survey has shown the importance and advantages of the use of a day care unit in the care of adult SCD patients especially in countries where the disease burden is high. The mandatory provision of day care service for the care of these patients at the various tiers of health care services in these countries would help the various countries to partly fulfill the recommendation by Diallo et al that African states should fight SCD in their health policies [13]. Hospitals that already have such provision should be assisted by government to upgrade the facilities, not only in the number of bed spaces but also in the provision of social services (through the provision of social workers and psychologists) and laboratory support as done in some centres [5].

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