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EDITORIAL

A snapshot on HIV/AIDS

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HIV/AIDS epidemic may have started in the mid-1970s, spreading across North & South America, Europe, Africa and Australia by the 1980s [1]. Various interventions have been employed over the years to mitigate the HIV/AIDS epidemic. The World Health Organization (WHO) has emphasized the need for countries to live up to their commitment to end the AIDS epidemic as a public health threat by 2030 considering the unacceptably high new infections and HIV-related deaths, more-so the two FastTrack the 90-90-90. The strategy envisions at least more than 90% people tested and know their HIV status, more than 90% accessing treatment immediately and more than 90% on treatment with undetectable viral load [2]. Although some studies have indicated a low uptake to treatment despite high response to testing [3], there is evidence of improved viral suppression in people receiving treatment early. Zambia's change in treatment policy, adopting the WHO 2013 guidelines that recommends treatment on confirmation of HIV status, has led to 59% of adults on ART achieving viral suppression [6]. We recommend an increase in advocacy for a test and treat approach in order to reduce incidence of HIV and improve the livelihood of those already infected.

General statistics

More than 40 years from the beginning of the epidemic, HIV continues to be a global public health issue with a cumulative total of 35 million deaths as of 2016. At the end of 2016, an estimated 37 million people were living with HIV infection, of whom an estimated 43% were children [4]. The African region is most affected, with 25.6 million people living with HIV infection in 2016, of whom 1.2 million people live in Zambia [5]. According to preliminary findings of the Zambia Population-Based HIV Impact Assessment, conducted between March and August 2016, the prevalence of HIV infection among persons between 15–59 years of age was 12.3%, with more women (14.9%) than men (9.5%) affected [6]. Of the estimated 1.8 million new infections globally each year, Africa accounts for 64% [7]. A 19% decline in prevalence was recorded in Zambia between 2003 and 2015 [8].

New infections

Globally, a reduction of new HIV infections from 2.1 million in 2015 to 1.8 million in 2016 [9] is encouraging. A reduction in new infections in many countries is partly due to various early interventions that initially focussed on preventing sexual transmission of HIV through behaviour change followed by a more comprehensive approach that took into account underlying socio-cultural, economic, political, legal and other contextual factors [10]. Later,

mother-to-child transmission was reduced by programs that provided anti-retroviral therapy (ART) to infected pregnant women. Finally, widespread use of ART reduced transmission by making infected persons less infectious. An 8% decline was also noted between 2010 and 2015 [11] in the general population and a decline of 47% among children, from 300,000 new infections in 2010 to 160,000 in 2016 [9]. WHO also reported a 39% drop in new infections globally between 2000 and 2016 with an estimated 44% of new infections occurring among key populations and their partners [4].

Access to treatment

Although there is no cure for HIV infection, effective antiretroviral (ARV) drugs reduce morbidity and prevent transmission, allowing people with HIV, and those at substantial risk, to enjoy healthy, long and productive lives [4]. Despite the proven benefit of ARV drugs, there are infected persons without access to them. The UNAIDS reported that in mid-2016, more than 18 million people, twice as many as 5 years prior, had access to antiretroviral therapy; about 910 000 of them children. There has been a steady increase in people with HIV accessing ART, with 15 million in 2014 to 18 million plus in 2016 [12] and by 2017, 19.5 million people living with HIV were receiving ART globally. According to WHO, in 2017, there are 54% of adults and 43% of children living with HIV on ART and that global coverage for pregnant and breastfeeding women living with HIV has reached a high at 76% [4]. It is envisaged that if efforts to increase access to treatment are sustained and increased, the world will be on track to achieve the target of 30 million people on treatment by 2020 [12]. In 2016, Zambia reported 1.2 million persons with HIV, among whom 67% of adults and 52% of children were on ART. The adoption of the 2013 WHO treatment guidelines calling for treatment of all persons testing positive for HIV regardless of CD4 count, has led to viral suppression in close to 60% of adults [8].

Known HIV status

According to the WHO, in 2017 only 70% of people with HIV infection know their status. In Zambia, the HIV testing and counselling initiative was implemented and although an increase in uptake of HIV testing was observed, 2015 data showed only a 15% testing rate. The 2013–14 Zambia's Demographic and Health Survey indicated that among adults, 46% of female and 37% of male respondents reported having had an HIV test [13]. In 2016, slightly over 42% of young people (aged 15-24 years) in Zambia were aware of their HIV status [8]. Recently, the Zambian Government announced an emphasis on routine HIV testing. The Society for Family Health in Zambia, a partner to Population Services International (PSI) in Malawi, Zambia and Zimbabwe, implemented a pilot UNITAID/PSI HIV Self-Testing Africa (STAR) project (2015-2017). They reported that HIV testing had a positive impact on uptake and coverage in self-testing including linkage to post- test services and that it is feasible to implement HIV self-testing in the public sector [14].

Way forward

Zambia has joined many countries in endorsing the 90-90-90 strategy targeted at ending the AIDS epidemic. The strategy stipulates "By 2020, 90% of all people living with HIV will know their HIV status. By 2020, 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy. By 2020, 90% of all people receiving antiretroviral therapy will have viral suppression" [15]. Effectively and consistently implementing this strategy gives hope in ending the AIDS epidemic that has affected people of all ages.

This issue of *The Health Press* includes a perspective entitled 'The advent of HIV self-testing in Zambia' based on UNITAID/PSI HIV Self- Testing Africa (STAR) project (2015-2017. Also in the issue is an article entitled 'Universal health coverage alliance towards equity in health services by 2030 as a means to achieve key sustainable development goals in The Zambian Government is committed to providing equal and equitable health support to the whole

population. We also publish in this issue a report on a study that established the clinical picture and correlates for Sickle Cell Anaemia (SCA) among Zambian children attending Arthur Davison Children's Hospital Sickle Cell Disease Clinic in Zambia.

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PERSPECTIVES

The advent of HIV self-testing in Zambia

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Globally, an estimated 60% of human immunodeficiency virus (HIV) - infected individuals remains untested and unaware of their sero-status [1]. Access to testing remains an issue in many regions and fear of stigmatization and discrimination continues to threaten acceptance of HIV testing services worldwide [2]. The overall goal of the HIV Self-Testing Africa (STAR) Project was to improve access to HIV testing via a simple HIV self-testing (HIVST) procedure using OraQuick [STAR Project] device in high burden African Countries, Zambia being one such Country. The Project is another attempt to bridge the gap created by an estimated 19 million people world-wide living with HIV but being unaware that they are. The grave consequences are obviously that such untested individuals neither can seek treatment for ailments consequent to being HIV positive nor make conscious choices to engage in prevention behaviors against causing harm to self and/all others.

Introduction

Even with advancements in providing access to HIV testing services, approximately 40% of Zambians have never tested for HIV. Zambia was fortunate to have been selected for the pilot project whereby UNITAID/Population Services International (PSI) (UNITAID-PSI) invested $23 million in three Countries, others being Malawi and Zimbabwe. The pilot involves distribution of nearly 750,000 test kits and modeling self – testing among the population. In Zambia, the catchment comprises the high-risk age group of 16 to 45-year-olds – the segment of the population known to be most vulnerable to HIV transmission.

Rationale

Improved access to HIV testing is foreseen to have huge potential to impact HIV prevention, care and treatment goals. It is also hoped that at the end of the current first phase of the STAR Project in Zambian 4 districts of Ndola, Central Province (Kapiri Urban and Kapiri Rural), Lusaka and Choma will result in other emerging evidence, will inform World Health Organization (WHO) normative guidance and support the establishment of appropriate policy. Further, it is believed that, this ongoing first phase will generate vital information about how to distribute self-test products effectively, ethically and efficiently, with adequate post-test support services.

Benefits to HIV Self-Testers

STAR Project research studies in Zambia and Malawi since 2016 reveal that the OraQuick device is easy to use, provides an alternative for people concerned about intimacy and confidentiality, and gives individuals control of when and where to test. It is further suggested that, men and young people were thought to be particularly likely to benefit from a provision of HIV testing away from health facilities – spaces associated with women's health-seeking behavior [3].

Concerns

Although no substantial social harms have been recorded across the regions in Zambia, lack of counseling prior to receiving HIVST kit, post-test counseling, ensuring linkage to additional services and linkage to care remains a challenge. The potential for coercive use of self-testing devices and doubt in their accuracy remains too a source of lack of self-linkage to additional services by majority self-testers. Due to combination of a myriad of socio-economic resulting in everyday dominance of men over women in the community, men may coerce their female partners into testing. Discordant results within a couple might result in arguments or violence – especially if they had not linked to receive additional counseling. People getting reactive results might be unlikely to seek confirmatory tests or link themselves to medical care due to reasons related to fear of stigma and discrimination.

Conclusion

An enhanced follow-up system of clients that will involve enquiring about test results via mobile phone technologies, asking about harms and measuring linkage to care by skilled psychosocial counselors need to be considered as the future of ongoing emotional support to HIV self-testers. Given the target population that includes 16 up to 20 years old mighty be too young to handle emotional pressure that will come along coping with HIV reactive results and if left unchecked could result in increased substance abuse and difficulties to excel in areas of life such academics. HIVST can be the future of Zambian citizens coming to a point of realization that owning one's health is essential for quality of life and value added for positive, productive and healthier lives.

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PERSPECTIVES

Universal health coverage alliance towards equity in health services by 2030 as a means to achieve key sustainable development goals in Zambia

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A Perspective on Universal Health Coverage in Zambia

In December 2006 Zambia launched Vision 2030 to guide the development of the country into a prosperous middle-income country whose one of the key tenets is to ensure a Healthy and Productive population contributing to the socio-economic development of the nation. This aspiration assures that all people access quality health care [1]. This pronouncement which in essence closely relates to Universal Health Coverage (UHC) was followed by Zambia's government signing up for the International Health Partnership (IHP+) in 2007 [2]. Political commitment to and national ownership of UHC has been evident for more than a decade in Zambia. UHC being the provision of quality health services that all people need and have access to without financial, geographic and social barriers has been attained by a number of countries but continue to be target yet to be achieved for the majority of developing countries.

Systematic interventions targeted at an improved health status of the peoples of member states the world over have been formulated for many decades with some positive gains but not reaching set goals for all populations. Some of these efforts include the Alma Mata Declaration of 1978; Health for All by 2000; the Ouagadougou Declaration on primary health care of 2008; the Millennium Development Goals 2000-15 and in 2015 the Sustainable Development Goals Agenda 2030 (SDG 2030.) [3].

On 23 September 2016, the WHO announced the formulation of the International Health Partnership (IHP+) for UHC 2030 as a revival of momentum to deliver improved health outcomes across the globe. This UHC 2030 alliance is aligned to the Sustainable Development Goals (SDG) 2030 with a commitment to leaving no one behind. The failure to align and comply with the "seven behaviours" success factors for IHP+ contributed to aid ineffectiveness and a consistent lack of adequate partnership harmonization in many countries including Zambia [4]. In 2016 the Sustainable Development Goal Partnership Framework (2016-21) was launched in Zambia as a modality that underscores the engagement of the United Nations family in Zambia with the government in all sectors including the health sector.

One of the challenges of achieving UHC has been inadequate financing for its implementation. Although up to 80% of UHC can be funded through domestic resources in Zambia, this has tended to be from out of pocket payments pushing the borderline poor to outright poverty. The contribution through social protection safety nets such as social cash transfers support and or independently of social health insurance schemes are best practices applied to reduce out of pocket expenditure and avert poverty. Countries which have successfully sustainably achieved UHC have diligently addressed out of pocket expenditure [5].

Figure 1 His Excellency, President Edgar Chagwa Lungu (green tracksuit) challenges The Honourable Minister of Health Dr Chitalu Chilufya MP (blue tracksuit) to push-ups during the national health week, 2017. Photo/MoH

The road towards UHC in Zambia began in 2007 when the country was one of the first 26 signatories to IHP+ targeted at improving health care to its people with support from government and limited contribution from health sector partners. The desired goals were not readily realized largely due to failure by partners to comply with the 7 behaviours necessary for successful health sector outcomes [2]. Some of these behaviours were needed for partners support to rally around the same strategic plan, with priorities adhered to with financial and other support systems as well as monitoring and evaluation approaches. Some reasons for the failure to apply the principles of aid effectiveness were seen in the persistent fractionation of development partner programmes, insufficient coordination between all stakeholders of the health sector and the lack of ownership of externally funded health programmes by the Zambian government.

Transformative agenda in the health sector in Zambia towards UHC 2030

All the UN member states including Zambia agreed on achieving UHC as one of the targets for the Sustainable Development Goals (SDG) 2030. Most of the developed countries have already achieved UHC. Zambia has recently renewed her efforts to comprehensively strengthening health systems through a health sector transformative agenda focusing on primary health care by emphasizing in that order promotive, preventive, curative, rehabilitative and palliative health care services. In all these consideration, the government through recognition of social determinants of health is providing unprecedented attention for attaining UHC by 2030 in line with its blue print Vision 2030.

The timing and convergence of UHC 2030 is aligned to the SDG 2030 with focus on the SDG 3 on equitable health outcomes and wellbeing, global public health security and resilient societies. In addition, UHC 2030 is a success factor for achieving other SDGs which constitute social determinants of health such as SDG 1 on reduction of poverty, SDG 4 on quality education, SDG 5 on gender quality, SDG 8 on inclusive development and decent jobs and SDG 16 on inclusive societies [6].

The new Government of the Republic of Zambia following the elections in August 2016 has launched a paradigm shift in the health sector reviving the goal of attainment of UHC. The Vision 2030 includes the strong commitment by the Government of Zambia to sustainably strengthen public

health. The key elements of this renaissance focus on the sector is restructuring of the public health sector with one key decision made of establishing the Directorate of Health Promotion, Environment and Social Determinants whose thrust is to promote good life styles, behaviours and prevention of disease. In addition, the new directorate is anchoring intersectoral collaboration arising from the fact that most of the determinants of health lie outside the health sector.

Health system strengthening buttressed by a robust and well-trained human resource and complemented by evidence based strategies and the other pillars of health systems are paramount to achieve UHC. The government recruited more than two thousand health workers in 2016 and another 7,400 in 2017 to improve expected minimum health worker ratio of 23 per 10,000 populations required meeting UHC [7].

This acclamation towards a promotive and preventive approach was followed by the launch of the inaugural National health week held from 27 November to 4 December 2016 by His Excellency the President of Zambia; Mr. Edgar Chagwa Lungu represented by the Her Honour the Vice President Madam Inonge Wina. This national event targeted prevention of disease through empowerment of individual, families, communities and the entire nation to promote healthy living including physical activity, consumption of fruits and vegetables, keeping environments and surrounding clean, as well as the cessation of tobacco use and alcohol abuse.

The highest-level commitment to the transformative agenda for achieving UHC has been underscored by the second National Health Week from 2 May to 6 May 2017 which was officially launched in Lusaka by His Excellency the President of Zambia. The key areas of Health Promotion, Primary Health Care, Social Determinants of Health and the Environment are combined with encouragement to engage in physical activity and general prevention measures for non-communicable diseases. The Cabinet of Zambia has approved the practice of Health in All policies which is an undertaking to ensure recognition that health is a domain of many ministries. Until now health has been the sole mandate of the Ministry of Health yet other government sectors inter alia nutrition, agriculture, transport, housing, infrastructure, and environment are equally key.

In Zambia, the subject of out of pocket expenditure is being managed through two modalities; firstly, through fiscal expansion of social cash transfer and secondly through partner contribution to the same targeted at vulnerable populations countrywide. In addition, the National Social Health Insurance Scheme is at an advanced stage with Parliament expected to pass the bill before the end of 2017.

Stakeholder engagement through comprehensive policy dialogues particularly Civil Society and private sector requires strengthening. The Directorate of Health Promotion, Environment and Social Determinants and the Directorate of Health Policy and Planning are expected to galvanize stakeholder coordination and intersectoral collaboration.

In addition, the Zambia Medical Association in liaison with Health Professions Council of Zambia can facilitate the engagement of these stakeholders in aligning their activities to the priorities of the National Health Sector Plan 2017 - 2021 in the interim and long term to UHC 2030. Indeed, it's very cardinal to ensure that no one is left behind be it public, private, civil society, non – government organizations, academia, media, professional bodies, leadership at various levels as we move towards UHC 2030.

As afore said, the requisite inputs for UHC 2030 are either in place or in advanced phases of finalization for successful implementation and achievement of health sector expectations of Vision 2030 and UHC/SDG 2030 [8].

With unprecedented political will being demonstrated at all levels, what remains is continued health system strengthening and advocacy by walking the talk in this critical area of UHC by 2030 and Zambia shall never be the same.

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RESEARCH REPORT

Clinical picture and correlates for sickle cell anaemia among Zambian children attending Arthur Davison Children's Hospital Sickle Cell Disease clinic in Zambia

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Sickle cell anaemia (SCA) leads to high rates of morbidity and eventually death in persons aged 20-29 years. The objective of the study was to establish the clinical picture and correlates for SCA among Zambian children attending Arthur Davison Children's Hospital Sickle Cell Disease clinic in Zambia. All 320 records were reviewed. The proportion of patients with SCA attending a sickle cell disease clinic was 43.4%. Difficulty in breathing (64.5%), sore throat (64.5%), fever (62.9%), swollen/painful limbs/joints (46.8%), dizziness (35.5%) and jaundice (35.5%) were the most common signs and symptoms for SCA. Only age was significantly associated with SCA. Children aged less than one year were less likely to have SCA compared to children aged 10 years or older. Sickle cell anaemia manifests later in life. There is need for implementation of programmes that will diagnose the condition much earlier in life so that interventions directed at the commonest causes of medical admission are started early.

Introduction

Sickle cell disease (SCD), an autosomal recessive disease, is one of the most common genetic disorders in the world. Diallo and Tchernia [1] suggested that approximately 200 000 children are born with SCD worldwide every year and that three quarters of these births occur in sub-Saharan Africa [1]. The disease is a chronic debilitating disorder affecting erythrocytes (red blood cells), which is most common among people from Africa, India, the Caribbean, the Middle East, and the Mediterranean [2].

Sickle cell disease (SCD) is a disease in which people inherit abnormal haemoglobin gene called haemoglobin S or sickle haemoglobin in their red blood cells from parents [3]. When the haemoglobin S gene is inherited from both parents, haemoglobin SS, the disease is called sickle cell anaemia. Haemoglobin SS is the most common and severe form of SCD. The other forms of the SCD are Haemoglobin SC, Haemoglobin Sβ0 thalassemia, Haemoglobin Sβ+ thalassemia, Haemoglobin SD,

Figure 1 Determination of haemoglobin solubility test results

haemoglobin SO and Haemoglobin SE. People who inherit a haemoglobin gene "S" from one parent and a normal gene "A" from the other parent are said to have sickle cell trait [4].

SCA results in high rates of morbidity and subsequently death mainly before the age of 20-30 years [5]. Although in its heterozygous form, the haemoglobin S gene provides substantial protection against malaria, malaria is probably the most important cause of morbidity and mortality in SCD in Africa [6]. Athale and Chintu [7] reported that the SCA patients accounted for 2.9% of the total admissions and the average case fatality was 6.6% of the total SCA admissions. The highest mortality rate was noted in the 1-5 years age group (54.8%). The common causes of death were infections (29.5%), vasoocclusive crises (22.7%) and splenic sequestration crises (20.5%). Leg ulcers, priapisms [8,9], stroke [10] and vaso-occlusive pain episodes [11] are also common in individuals with SCA. It is important that characteristics of persons with SCA are established to appropriately manage these patients. There is limited information on clinical data on SCA on Zambia. Hence,

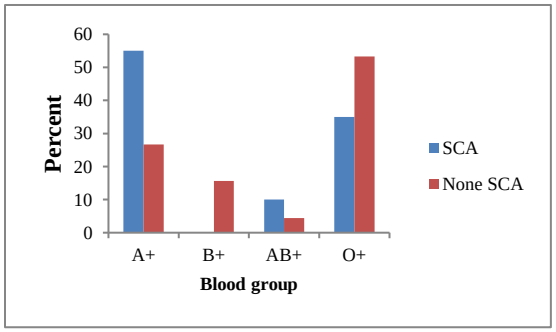

Figure 2 Distribution of blood groups

the objective of the study was to establish the clinical picture and correlates for SCA among Zambian children attending Arthur Davison Children's Hospital (ADCH) Sickle Cell Disease Clinic in Zambia.

Methods

A hospital case record review was conducted at Arthur Davison Children's Hospital Sickle Cell Disease Clinic between April and June 2015. All 320 records for SCD patients were reviewed. Patients were examined by attending doctors who recorded their findings in patient files. Haemoglobin (Hb) SS, AA

Table 1 Sample description

	Total	Male	Female	
Factor	n (%)	n (%)	n (%)	p value
Age (years)				
<1	48 (15.0)	31 (17.7)	17 (11.6)	0.349
1-4	104 (32.4)	58 (33.1)	46 (31.5)	
5-9	102 (31.8)	50 (28.6)	52 (35.6)	
10+	67 (20.9)	36 (20.6)	31 (21.2)	
Residence				
Low density	26 (8.1)	11 (6.3)	15 (10.3)	0.192
High density	295 (91.9)	164 (93.7)	131 (89.7)	
Blood group				
A^+	38 (27.0)	25 (29.1)	13 (23.6)	0.662
B^+	25 (17.7)	17 (19.8)	8 (14.5)	
AB^+	11 (7.8)	6 (7.0)	5 (9.1)	
O^+	67 (47.5)	38 (44.2)	29 (52.7)	
Malaria frequency				
1	106 (66.2)	63 (67.0)	43 (65.2)	0.806
2+	54 (33.8)	31 (33.0)	23 (34.8)	
Weight for age (Percentile)				
<2.5	163 (58.4)	92 (60.5)	71 (55.9)	0.435
2.5+	116 (41.6)	60 (39.5)	56 (44.1)	
Sickle Cell Anaemia				
Yes	62 (43.4)	28 (37.3)	34 (50.0)	0.127
No	81 (56.6)	47 (62.7)	34 (50.0)	

and AS were determined using a solubility test for detection of haemoglobins [12]. A red band of flocculate on the surface of a clear yellowish solution indicated Hb SS (sickle cell anaemia), while a clear pinkish solution indicated Hb AA, a test result resembling that of Hb AS indicated Hb SS +F and a sharply defined red band of flocculate on the surface of a pink coloured solution indicated Hb AS (Figure 1). Non-Hb SS was defined as none sickle cell anaemia. Giemsa staining was used to detect malaria parasites [13]. Parasite count for thin film of 5-10% in 1000 RBCs indicated that the infection was mild, 10-30% indicated that the infection was moderate and over 30% suggested that the infection was severe and the slide was negative if no parasites were seen.

A check list was used to abstract data from the records. The variables abstracted included age, sex, blood group, genome, residential address, signs and symptoms and associated conditions.

Data was computerised using Epi Data version 3.1 [14] and exported to SPSS version 16.0 [15] for data analysis. Associations between qualitative variables were established using the Chi-squared test at the 5% significance level. Independent factors associated with the outcome were determined using a multivariate logistic regression analysis. Odds ratio (OR) and 95% confidence interval (CI) are reported.

Results

A total of 320 records of patients attending a sickle cell disease clinic were reviewed of which 54.5% were males. Socio-demographic factors were not associated with sex (Table 1). Overall, most patients were of ages 1-4 years (32.4%) and 5-9 years (31.8%). The majority (91.9%) of the patients resided in high density suburbs.

Table 2 Correlates for Sickle cell anaemia

Factor	Total n (%)	With SCA n (%)	Without SCA n (%)	p value
Sex				
Male	75 (52.4)	28 (45.2)	47 (58.0)	0.127
Female	68 (47.6)	34 (54.8)	34 (42.0)	
Age (years)				
<1	30 (21.0)	6 (9.7)	24 (29.6)	<0.001
1-4	62 (43.4)	27 (43.5)	35 (43.2)	
5-9	38 (26.6)	26 (41.9)	12 (14.8)	
10+	13 (9.1)	3 (4.8)	10 (12.3)	
Residence				
Low density	7 (4.9)	2 (3.2)	5 (6.2)	0.418
High density	136 (95.1)	60 (96.8)	76 (93.8)	
Malaria frequency				
1	53 (73.6)	21 (77.8)	32 (71.1)	0.534
2+	19 (26.4)	6 (22.2)	13 (28.9)	
Weight for age (Percentile)				
<2.5	66 (53.2)	28 (50.0)	38 (55.9)	0.514
2.5+	58 (46.8)	28 (50.0)	30 (44.1)	

About a third (33.8%) of the patients had two or more episodes of malaria within 18 months. About 4 in 10 (41.6%) of the patients were in the 2.5 percentile or more weight for age category. The most common blood group was A+ among SCA patients (55.0%), while the most common blood group among none SCA patients was O+ (53.3%) as shown in Figure 2. The distribution of the genotypes was as follows: Hb AA (3 or 2.1%), Hb AS (78 or 54.5%) and Hb SS (62 or 43.4%), indicating that 43.4% of the patients had SCA. The most frequent signs and symptoms among the patients who had SCA were: difficulty in breathing (64.5%), sore throat (64.5) and fever (62.9%). About a third of the patients had dizziness (35.5%) and jaundice (35.5%) as shown in Table 3.

Table 2 shows factors associated with SCA. Only age was significantly associated with SCA. SCA is less likely to be manifested in the <1 year age group (OR=0.42, 95% CI [0.19, 0.91]) and more likely to be manifested in 5-9 years group (OR=3.64, 95% CI [1.89, 7.03]) compared in persons aged 10 years or older (Table 4).

Discussion

The proportion of patients with SCA attending a sickle cell disease clinic in the

current study was 43.4%. Difficulty in breathing, sore throat, fever, swollen/painful limbs/joints, dizziness and jaundice were the most common signs and symptoms. Only age was significantly associated with SCA. Children aged less than one year were less likely to have SCA compared to children aged 10 years or older. A proportion of SCA of 43.4% observed in the current study is lower than the 62% that was observed by Gill et al [16] in the United States of America.

Table 3 Distribution of signs and symptoms for Sickle Cell disease patients by Hb SS genotype

	SCD Total=322	SCA Total=62	None SCA Total=81
Sign/symptom	n (%)	n (%)	n (%)
Fever	210 (65.2)	39 (62.9)	64 (79.0)
Headache	58 (18.0)	9 (14.5)	13 (16.0)
Vomiting/ Diarrhoea	75 (23.3)	14 (22.6)	23 (28.4)
Reduced appetite	69 (21.4)	9 (14.5)	32 (39.5)
Dizziness	112 (34.8)	22 (35.5)	34 (42.0)
Cough	8 (2.5)	1 (1.6)	3 (3.7)
Sore throat	205 (63.7)	40 (64.5)	60 (74.1)
Backache	48 (14.9)	12 (19.4)	14 (17.3)
Abdominal pain	42 (13.0)	9 (14.5)	7 (8.6)
Swollen/painful limbs/joints	114 (35.4)	29 (46.8)	24 (29.6)
Difficulty in breathing	193 (59.9)	40 (64.5)	50 (61.7)
Chest pain	61 (18.9)	13 (21.0)	23 (28.4)
Pallor	44 (13.7)	5 (8.1)	8 (9.9)
Jaundice	125 (38.8)	22 (35.5)	31 (38.3)
Sneezing	117 (36.3)	18 (29.0)	26 (32.1)
Runny nose	70 (21.7)	12 (19.4)	27 (33.3)
General body pain	29 (9.0)	9 (14.5)	9 (11.1)
General body weakness	37 (11.5)	8 (12.9)	8 (9.9)
Splenomegaly	39 (12.2)	5 (8.1)	16 (19.8)
Hepatosplenomegaly	4 (1.2)	3 (4.8)	3 (3.7)
Eye discharge	14 (4.3)	1 (1.6)	4 (4.9)
Ear discharge	7 (2.2)	1 (1.6)	0(0)

The common signs and symptoms for SCA in the current study were: difficulty in breathing, sore throat, fever, swollen/painful limbs/joints, dizziness and jaundice. Meanwhile, painful crises and acute chest syndrome were the most common sickle cell-related events in SCD patients in the United States of America [16]. Meanwhile, painful events, splenic sequestration, hemolytic crisis,

Table 4 Magnitude of association of age with Sickle Cell Anaemia

Age (year)	Odds ratio (95% Confidence Interval)
<1	0.42 (0.19, 0.91)
1-4	1.30 (0.73, 2.29)
5-9	3.64 (1.89, 7.03)
10+	1

foot-hand syndrome, infection and acute chest syndrome were the common clinical phenotypes reported by da Silva Filho et al [17] in under 6 year-old-children in Rio de Janeiro, Brazil.

Age was significantly associated with SCA in the current study. SCA is more likely to be manifested in age groups older than one year. SCA complications start in early life, but become more apparent with increasing age [2]. Foetal haemoglobin (Hb F) may be responsible for the lack of clinical symptoms in new-borns with SCD [18].

It is possible that some cases may have been misclassified as non-sickle cell anaemia because of having recently received transfusion of blood with Hb AS or normal blood. Our findings may have been biased to the extent of this misclassification. However, we believe that this bias may have been negligible because the cases attending the SCD clinic may have been tested for genotype more than once.

In conclusion, sickle cell anaemia manifests later in life. There is need for implementation of programmes that will diagnose the condition much earlier in life so that interventions directed at the commonest causes of medical admission are started early.

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