Original Research Article

Social characteristics associated with outcome of paediatric human immunodeficiency virus admissions

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ABSTRACT

Background: Information on social characteristics in human immunodeficiency virus (HIV) infected Nigerian children is scarce. The association between social characteristics such as single parenthood, low socio-economic status, polygamy and lack of parental education on the outcome of paediatric HIV admissions has been under studied.

Methods: Information was obtained from the case notes of HIV infected children between the year 2006 and 2012 at a Nigerian tertiary hospital. Details of the information extracted include socio-demographics, diagnoses and outcome of management. Data was analysed with the SPSS 18 software.

Results: Fifty (1.73%) of the total 2897 paediatric admissions were due to HIV disease. The mean age of the children studied was 3.7 ± 2.9 years and the 50 children were made up by 27 boys and 23 girls, giving a male to female ratio of 1:0.9. The mean age of the mothers and fathers were 28.7 and 36.7 years respectively. Pneumonia, septicaemia and tuberculosis accounted for more than 60% of admissions. Five (10.0%) children were from the upper, 12 (24.0%) from the middle and 33 (766.0%) from the lower socioeconomic classes. Twenty-four parents (couples) were both sero-positive for HIV and 7 discordant. Nineteen (38.0%) could not be classified because the status of the father was unknown. Of the 7 sero-discordant parents, 3 sero-negative fathers neglected their families. Thirty-nine children were from monogamous homes, nine from polygamous and two were raised by single parents. There were two discharges against medical advice and eleven deaths. The average number of siblings of the children studied was 2.57 ± 2.1 . Mortalities on admission were significantly associated with, parental financial constraints and the admitted HIV infected child having more than one sibling ($p < 0.05$).

Conclusions: It was concluded that appropriate interventions to manage these associations will most likely improve the outcome of admissions. Strategies of improving disclosure and prevention of negative outcome of disclosures, such as family neglect in sero-discordant couples also need to be identified.

Keywords: Characteristics, Childhood, HIV, Outcome, Social

INTRODUCTION

Paediatric HIV infection is rapidly emerging as a major contributor to morbidity and mortality in developing

countries.¹ The numbers of people estimated to be infected were 33.4 million with more than 90% of this infection occurring in sub-Saharan Africa in the year 2008.¹ Thus this disease has attracted a lot of attention

and most of the available studies have paid emphasis to transmission, clinical profile and outcome of infected patients, thereby neglecting the socio-economic aspects of the disease.²⁻⁴

A few studies have however tried to describe some aspects of the socio-economics of this disease, such as age of the children and parents in addition to education and occupation of the parents.^{4,5} Other aspects described by these studies include HIV status of the parents and mode of transmission of disease. Although, the findings from these studies have been found to be valuable, they are however not exhaustive. Both studies were also conducted more than a decade ago and an update on this aspect of paediatric HIV disease is long overdue.^{4,5}

This study was conducted in order to provide a comprehensive update on the social characteristics of HIV infected Nigerian children. It was carried among HIV infected children admitted to the paediatric unit of the Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital, Osogbo, Osun State, Nigeria. The hospital is well patronized by the people of Osun State and the neighbouring states. Osogbo city is the capital city of Osun state, which is one of the 36 states of Nigeria and it was reported to have a population of 3.2 million people at the 2006 national census.⁶ The hospital provides tertiary health care services and free health services for HIV infected children and it is supported by the government of Nigeria and the United States President's emergency plan for AIDS relief program.

METHODS

This was a retrospective study conducted by a review of case notes of HIV infected children admitted to the Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital, Osogbo, Osun State, Nigeria. Case records of all HIV infected paediatric admissions between the 1st of January 2007 and 31st December 2012 were studied. Information concerning the socio-demographic details, diagnosis at discharge and outcome were extracted from the case notes. Other details of the social history extracted include type of family setting type (monogamous or polygamous), HIV status of parents, condition of the parents and siblings (alive or death) number of siblings of the patient and the HIV status of the siblings.

Children whose mothers were HIV positive and with no risk factors for HIV were identified and classified to be vertically infected, while those whose mothers were HIV negative with risk factors for HIV infection were classified as horizontally infected.

The socioeconomic classification of the children was based on Ogunlesi's social classification system.⁷ This is based on the mean of a set of scores, assigned for the educational attainments and occupation for the parents.

Scores of 1-5 were assigned to each education or occupation category. The scores assigned to the different categories correspond to the 10th, 25th, 50th, 75th and 90th percentile of incomes of Nigerians.⁷ The mean scores are approximated to the nearest whole number. Scores of 1 and 2 correspond to the upper socioeconomic classes, while a score of 3 is equivalent to the middle class and scores of 4 and 5 to the lower socioeconomic classes.

All the obtained information was analyzed using SPSS 18. Means, median and standard deviation were computed for categorical variables and frequencies for categorical variables. Associations of categorical variables were tested with chi-square and values less than 0.05 were regarded as statistically significant.

RESULTS

A total 2897 children were admitted to the paediatric wards of the Ladoke Akintola University of technology Teaching Hospital, Osogbo over the study period. The 50 children admitted with HIV represent 1.73% of the total admissions. A total of 11 deaths were recorded amongst the 50 admitted children giving a case fatality rate of 22.0% and a mortality rate of 5.3% amongst the total 206 paediatric admissions that died.

Age and sex distribution of the children studied

Fifty children were studied were constituted by 27 boys and 23 girls, giving a male to female ratio of 1:0.9. The mean age of the children studied was 3.5 ± 2.9 with their ages ranging between 2 months and 11 years.

Table 1: Age and sex distribution of patients studied.

Age	Gender	
	Male	Female
1 mth - 1 year	3	7
>1-2 years	4	2
>2-3 years	4	3
>3-4 years	0	3
>4-5 years	6	1
>5-6 years	2	1
>6-7 years	2	0
>7-8 years	4	3
>8-9 years	0	0
>9-10 years	0	1
>10-11 years	2	1
>11-12	0	1
Total	27	23

Of the 50 children studied 33 (16.7%) were aged between 2 months and 5 years. Thirteen were in the age bracket between >5-10 years and the remaining 4 children studied were aged 10 years and above. The age range of the mothers was 20-44 years with a mean of 28.7 years, while the range was 27-57 years with a mean of 36.7

years for the fathers. Details of the age sex distribution of the children studied are shown in Table 1.

Diagnoses and outcome

Pneumonia, septicaemia and tuberculosis accounted for more than 60 percent of the admissions. Other no so common diseases diagnosed among the studied children include malaria, meningitis, chronic secretory otitis media, osteomyelitis, pharyngotonsillitis, right hip septic

arthritis and cardiomyopathy with heart failure. Thirty-seven (74%) children were discharged in a satisfactory condition after completing their treatment, while 11 (22.0%) of the 50 died. Two other children were discharged against medical advice.

Specifically, one of the two children that was discharged against medical advice had osteomyelitis while the other had septicaemia. Table 2 shows the diagnoses and the outcome of studied children.

Table 2: Diagnoses and outcome.

Diagnoses	Number N=50 (%)	Outcome	
		Discharged	Death
Pneumonia	18 (36%)	13	5
Tuberculosis	8 (16%)	6	2
Septicaemia	8 (16%)	4	2
Malaria	3 (6%)	3	0
Gastroenteritis	2 (4%)	1	1
Diarrheal disease	1 (2%)	1	0
Septic arthritis	1 (2%)	1	0
Febrile convulsion secondary to chronic secretory otitis media	1 (2%)	1	0
Meningitis	1 (2%)	1	0
Croup	1 (2%)	1	0
Pharyngotonsillitis	1 (2%)	1	0
Osteomyelitis	1 (2%)	1	0
Seizure disorder	1 (2%)	1	0
Cardiomyopathy with cardiac failure	1 (2%)	1	0
Disseminated candidiasis	1 (2%)	0	1
Fracture of the radius	1 (2%)	1	0
Total	50 (100%)	39	11

Table 3: Maternal occupation and educational status of the admitted children.

Educational status N = 50	Frequency (%)	Occupation N = 50	Frequency (%)
University education	2 (4.0%)	Professionals, lecturers, Managers, doctors and equivalents	0
Other tertiary training apart from university	9 (18.0%)	Teachers, nurses and laboratory scientists	11 (22.0%)
College and equivalent	18 (36.0%)	Medium grade traders and youth corpsers	19 (38.0%)
Primary school and equivalent	16 (32.0%)	Petty traders, hairdressers, laboratory technicians, tailors, food vendor	12 (24.0%)
No formal education	5 (10.0%)	Housewives, unemployed and students	8 (16.0%)
Total	50 (100.0%)		50 (100.0%)

Mode of transmission and HIV status of the parents

The mode of transmission of HIV to the children was vertical in 49 (98.0%) and horizontal in one (2.0%). Of the 50 mothers studied 49 (98.0%) tested positive for HIV. Concerning the 50 fathers, 24 (48.0%) were HIV positive, 7 (14.0%) were HIV negative and the HIV status of the remaining was unknown. Thus 24 (48.0%) parents were both HIV infected while 7 (14.0%) were discordant and the remaining 19 (38.0%) couldn't be

classified because the fathers status could not be ascertained.

Occupation and educational attainments of parents

Concerning the educational attainments of the mothers of the children studied most of them had primary school and secondary school education, while none had university training. Most of the mothers were traders, hairdressers, tailors and food vendors.

The details of the educational attainments and occupation are shown in Table 3. In a manner similar to the mothers most of the fathers were had primary school and secondary school education and the minority attended the

university. On the other hand, most of the fathers were policemen, traders, teachers and artisans. The details of their occupation and educational attainment are shown in Table 4.

Table 4: Paternal occupation and educational status of the admitted children.

Educational status N=50	Frequency (%)	Occupation N=50	Frequency (%)
University education	6 (12.0%)	Professionals, lecturers, Managers, Engineers, doctors and equivalents	6 (12.0%)
Other tertiary training apart from university	11 (22.0%)	Teachers, nurses and laboratory scientists	11 (22.0%)
College and equivalent	16 (32.0%)	Medium grade traders and policemen and arabic teachers	16 (32.0%)
Primary school and equivalent	15 (30.0%)	Mechanic, cashiers, carpenters, peasant farmers, night guards, taxi and commercial bus drivers and motorcyclists	17 (34.0%)
No formal education	2 (4.0%)	Unemployed and students	0 (0.0%)
Total	50 (100.0%)		50 (100.0%)

Table 5: Social class and outcome.

Social class	Number N = 50	Outcome		
		Discharged	DAMA	Death
Social Class I	0 (0%)	0	0	0
Social Class II	5 (10%)	4	0	1
Social Class III	12 (24%)	4	0	8
Social Class IV	21 (42%)	17	2	2
Social Class V	12 (24%)	12	0	0
Total	50	38	2	11

Social class and outcome

Of the 50 children studied there were no children from class I, 5 (10.0%) from class II, 12 (24.0%) from class III, 21 (42.0%) from class IV and 12 (24.0%) from class V. Thus, five (10.0%) children were from the upper social class, 12 (24.0%) from the middle class and 33 (66.0%) from the lower social class.

One death was recorded among those from the upper social class in contrast to the ten deaths recorded amongst the other social classes. ($p=0.91$, $OR=0.88$, 95% $CI=0.09-8.74$). Table 5 gives more information on the social classes and the outcome of the studied children.

Financial constraints

Twenty-three parents were financially constrained and could not afford the investigations or treatment not provided free of charge, while 27 families had adequate resources to meet all the expenses that had to be paid for. Fifteen of the parents with financial constraints were from the lower socio-economic class and eight from the

middle class. Of the 23 children that their family had financial constraints 9 died compared with the two deaths amongst the group that were not financially constrained. The difference in both groups is statistically significant. ($p=0.01$, $OR=8.04$, 95% $CI=1.52-42.52$)

Family setting and number of children

Of the 50 studied children 39 (78.0%) were from a monogamous family background and 9 (18.0%) were from a polygamous setting. The remaining two (4.0%) were raised by single parents. The number of children in a family size ranged from one to six. Of the 50 admitted children 21 had more than 1 sibling, 24 had no siblings and five had a sibling. The average number of siblings of the HIV infected children studies was 2.57 ± 2.1 .

Nine deaths occurred amongst the 21 with more than 1 sibling in contrast to the two deaths recorded amongst the 29 children with one or no sibling. ($p < 0.01$, $OR=10.13$, 95% $CI=1.89-54.13$). Fourteen (28.0%) of the studied children had HIV-infected siblings while the remainder 36 (72.0%) did not.

Characteristics of the parents of the children that were discharged against medical advice

Concerning the two patients that were discharged against medical advice, one was from a polygamous family while the other was an orphan from a monogamous family. Both families also had financial constraints.

Outcome in orphans and those whose parents were alive

Six of the children had lost their fathers while 4 had lost their mothers to death, thus 10 (20%) of the study population were orphans. Three (50.0%) deaths were recorded amongst the 6 children whose fathers were dead compared to 8 (18.1%) deaths recorded amongst the 44 whose fathers were alive. ($p=0.10$, $OR=4.50$, 95% $CI=0.76-26.53$). Also, two (50.0%) death were recorded amongst the four children who had lost their mothers in contrast to the nine (19.6%) deaths recorded amongst the 46 whose mothers were alive. ($p=0.19$, $OR=4.11$, 95% $CI=0.51-33.27$)

HIV status of the parents and parental behavior.

All the parents were supportive in the management of their admitted children. The only exceptions were three of the 7 Sero discordant parents whose fathers were HIV negative. These fathers neglected the children during the course of admission and had further intentions of neglecting the family and dissolving their marriages.

DISCUSSION

The social background of the children studied was diverse. The age of the children ranged from 2 months to 11 years with a mean of 3.5 ± 2.9 years. This result is similar to another study conducted in Nigeria, where a range and mean age of 3 months to 10 years and 24.3 months was reported respectively.⁵ A higher mean age of 5.7 years was reported at India and this was attributed to the exclusion of infants.⁸

There was a male gender predilection for HIV in the present study, Authors findings are at similar to previous studies which reported a male gender dominance.^{2-5,8,9} Almost all the mothers were HIV infected and acquisition of HIV was majorly vertically in the children studied. Most of the parents were in the childbearing and maximal sexual activity age. These parents have the potential of future conceptions, thus, there is a need to screen parents for HIV and educate them on strategies that would reduce the risk of transmission of infections to future children or discordant partners. Previous reports also show that most parents are in the reproductive and most mothers are HIV infected, suggesting that vertical transmission was possibly the most common mode of HIV transmission.^{4,5,9,10}

The modality for screening the patients and their parents for HIV is also important, voluntary counselling and

testing strategy was utilized for the children studied. This strategy has the weakness of underestimating the prevalence of disease, in comparison with the provider-initiated testing and counselling (PITC). This may probably account for the low prevalence estimate of 1.73% obtained in the present study compared with other estimates of 5.7% and 10% obtained in other parts of Nigeria.^{3,10} A significant proportion of the fathers failed to disclose their HIV status, while all the mothers disclosed theirs. Disclosure is still a sensitive issue in Nigeria because of the associated rejection and stigmatization.¹¹ The exact burden of HIV is difficult to determine in populations concealing the disease. This can hinder the control of this disease, through delayed access to treatment and continued risk-taking habits. Thus, more effort needs to be added by the federal government and the health ministry in educating the citizenry and discouraging discrimination and stigmatization of the HIV infected populace. A previous study also showed that failure to disclose the HIV status is common among the fathers.⁹

Some sero-discordant couples were also found in the present study. This couples need to be handled sensitively in order to prevent separation from perceptions of infidelity and mistrust. No social barrier was recognized to HIV infection as demonstrated by affectation of children from all the socioeconomic classes. However, the upper socioeconomic class was the least affected. Findings from other studies show that HIV has a predilection for the upper and middle classes.^{5,13} Deaths were fewer among children from the upper class, probably because the parents in this class had a good financial backing and education which probably impacted positively on the care received by the children.

The findings on financial constraints in the present study further support our stance that the upper socio-economic class is better financially equipped to obtain care and treatment. Financial constraints were significantly associated with mortality in the present study. The occupation and educational attainments of the parents varied; however, the majority had undergone primary and secondary school training. Most of the mothers were traders, hairdressers and tailors, while most of the fathers were traders, artisans, transporters and policemen.

Thus, all categories of educational attainments were affected, while mothers with managerial professions or professionals were spared, also none of the fathers was unemployed. Previous reports show that most of the fathers are transporters, policemen or military men, while most of the mothers are unskilled labourers or housewives.^{5,12} The family size ranged between one and six and a third of the children had HIV infected sibling.

This underscores the need to improve on the prevention of mother to child services and also evaluate the uptake of family planning services among the parents. The significant association demonstrated in this study

between death in the admitted child and the patient having more than one sibling further underscores the need to evaluate and improve on family planning services. It is expected that families with smaller sizes will likely harness and concentrate their resources better in order to attain high quality living standards in contrast to large sized families. Most of the children studied were from monogamous homes, while the minority were raised by single parents. Among the minority raised by the single parents, the challenge of being raised by a single parent would have to be coupled with that of HIV infection.

This challenge needs to be recognized by the health management authorities and support programs for the vulnerable in order to improve on the existing services.¹⁴ Emotional support will also go a long way with coping with the disease, other psychological issues and death in siblings which was recorded in the present study. Polygamy was recorded in 19% of the present case series and it has its own challenges as the spouses and the children from the different wives tend to be rivals. In addition, it is difficult for such a family to harness resources and plan effectively for the different wives and children under such settings. Therefore, it was not surprising that a polygamous family accounted for one of the two cases discharged against medical advice. Orphans continue to be a major social issue associated with paediatric HIV infection in developing countries. It accounted for 20% of the case series studied and it was associated with one of two cases of discharge against medical advice. The association between being an orphan and mortality did not reach statistically significant levels among the present children studied. This may be a reflection of the quality of care given by the guardian, stepparents or active care. Previous studies however show that death is more common among HIV infected orphans.^{12,13}

CONCLUSION

It was concluded that social characteristics of paediatric HIV infected admissions have an important role to play in the outcome. Attention needs to be placed in identifying and supporting children having more than a sibling and care givers with financial constraints. Improved support is also advocated for orphans and children from the middle and lower socio-economic classes, through funding of the health services by the government and philanthropist in order to ensure a free or affordable health care delivery to all. More studies need to be conducted on factors that determine family size and utilization of family planning and prevention of mother to child transmission of HIV with the aim of improving on the utilization of these services

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