

Factors Associated With Late Presentation To Kenyatta National Hospital For Acute Severe Illness In Children Aged 2-59 Months

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ABSTRACT

Background: Delay in seeking appropriate healthcare for ill children is an important cause of morbidity and mortality especially for those aged below five years. Understanding factors that contribute to these delays in any particular setting is helpful to enable the concerned health worker(s) address the caretaker concerns insofar as this leads to late care seeking for illness with its subsequent implications. **Objective:** Determine the factors associated with late healthcare seeking behaviour among severely ill children aged 2-59 months presenting to Kenyatta National hospital. **Design:** A hospital-based case control study. **Setting:** The Paediatric Filter Clinic and the paediatric medical wards at the Kenyatta National Hospital (KNH). **Subjects:** Children aged 2- 59 months brought to hospital with acute severe illness and their caretakers. 316 caretakers and their ill children were enrolled into the study between November 2007 and February 2008. **Results:** Symptoms of cough and diarrhoea were likely to be associated with presentation later than 3 days with OR of 2.09 (CI 1.23-3.56) and 1.57(CI 1.01-2.73) respectively. Herbal Medicine was used by 5% of the study population and was associated with marked likelihood of late presentation [OR 41.7(CI 4.70-369.1)]. On survival outcome, there was enhanced chance of death in the cases compared to the controls [OR 4.69 (CI 1.62-14.6)]. The median length of hospital stay was longer for the cases (7 days vs 5 days) p=0.05. **Conclusion:** Caretakers bringing their acute severely ill children later than 3 days from illness onset to KNH (cases) are more likely to have explored other healthcare options first compared to similarly ill children brought within 3 days (controls). Cases had more adverse outcomes in terms of mortality and morbidity (as reflected by longer periods of hospitalization).

Keywords: 2-59 months, severe illness, care-seeking, delay, acute, referral.

Abbreviation

KNH: Kenya National Hospital

Introduction

Every year, almost 11 million children die before their 5th birthday, the daily death rate being 30000 children. Most of these deaths occur in developing countries. These deaths result from a disease or a combination of diseases that can be prevented or treated by existing inexpensive interventions. In Kenya, the Under 5 mortality rate was 121/1000 live births in 2006 and shows a progressive upward trend since 1990 when the figure was 97/1000 livebirths (UNICEF, 2007).

The World Health Organization (WHO) estimates that seeking prompt and appropriate care could reduce deaths due to acute respiratory infections (ARIs) by 20%. (WHO, 1991; p. 20) The Integrated Management of Childhood Illnesses (IMCI) strategy was developed by the WHO and UNICEF in an effort to reduce the increased child mortality from these common childhood killers. Besides improving providers' skills in managing childhood illnesses, IMCI also aims to improve families' care seeking behaviour. Health workers are trained to teach the mothers about danger signs and counsel them about the need to seek care promptly if these signs occur (WHO. 2000 ed, p. 21-22).

The Fourth Millennium Development Goal aimed at reduction of child mortality, the target was to reduce the under-5

mortality by two thirds, between 1990 and 2015. Child mortality is closely linked to poverty. Advances in infant and child survival have been occurring very slowly among people in poor countries and among the poorest people in wealthier countries (UN, 2005).

Appropriate care requires that a household recognizes promptly when a child is ill, decides early when an illness needs to be treated outside the home, and seeks timely and appropriate medical care (Hill *et al*, 2003). Tupasi *et al* (2002) identified poor symptom recognition ability by the care takers as an important barrier to timely care seeking.

The practice of wait and see has been reported as an important phase before health care seeking. Here the caretakers offer home care within 24 hours of illness onset and buy time to assess the case before conclusively deciding that what afflicts them or those under their care requires attention outside the home (Mwenesi *et al*, 1995). Nyamongo *et al* (2002) reports that most mothers waited upto three days before taking action for malaria, diarrhoea, and ARI related conditions. Mwenesi found that the average number of days between onset of illness and visit to a health facility was three days. Mothers gave different reasons for the three days time lag, though they generally treated their children promptly,

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within 24 hours of illness onset (Mwenesi *et al*, 1995) Another Kenyan study investigating fatal childhood illnesses in Siaya showed that the median delay in consulting a health provider after onset of symptoms was 2 days (Renu *et al*, 2001). In Uganda, Nshakira *et al* reported a waiting period of 3.6 days (median) following treatment at home (Nshakira *et al*, 2002).

The Kenya Government policy on cost sharing for health care exempts children below 5 years of age from payments except for a basic small fee to cover for consultation card and file. Other costs are however heavily subsidized by the government. The government also operates a National Health Insurance Fund (NHIF) that draws membership from both the salaried and non salaried citizenry and helps meet most of the inpatient bills for its members. The scheme is open to all Kenyans willing to make a minimal monthly contribution of ~US\$2.5*.

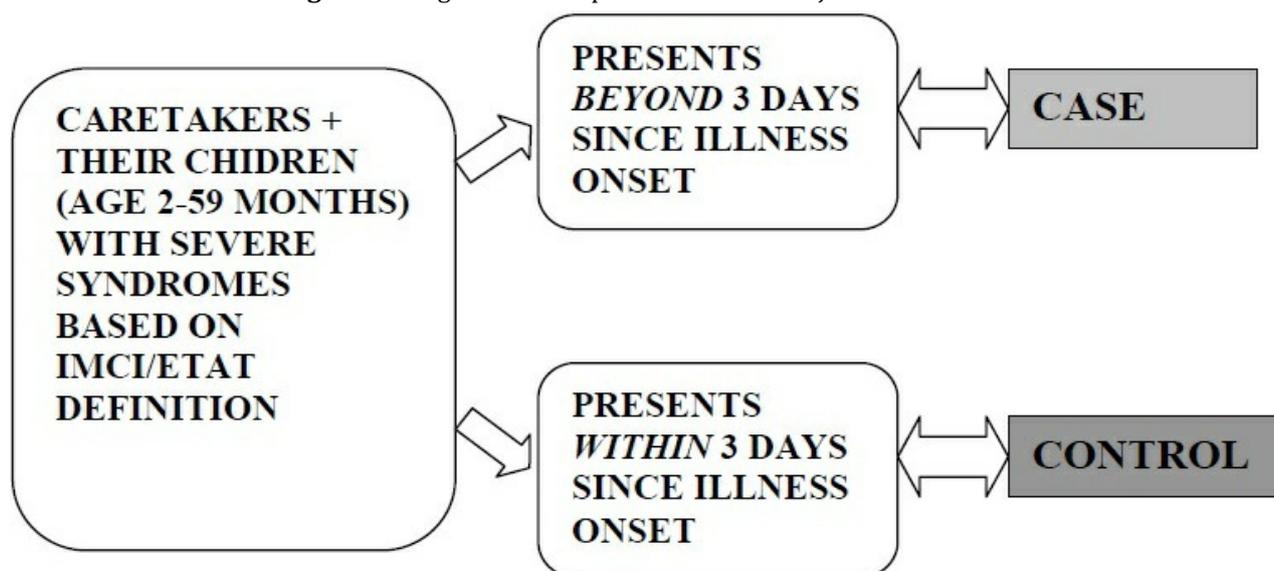
KNH as a government parastatal is required to raise a substantial cost from the patient, in order to cover some of its running expenses. As a result user fees are charged on all patients including children of all ages. There is a waiver system however, to identify and assist the needy patients and no patient is denied life saving and emergency care due to an inability to raise funds to meet the hospital bills.

The current study was carried with the aim of looking at why many children present to Kenyatta National Hospital with acute illnesses at advanced levels of severity. It differs somehow from many other almost similar studies carried out in communities by social scientists in that this is a hospital based study conducted in a clinical environment and therefore able to relate real illness to care seeking habits and subsequent outcomes. Besides it's also hoped that information coming from this study will help the health workers attending to ill children in Kenya's largest hospital to better understand the circumstances of these children and their caretakers and how this may relate to their clinical outcome.

Materials and Methods

Approval from the Kenyatta National Hospital ethics and Research committee was sought prior to the commencement of the study. The study was carried out between November 2007 and February 2008. A hospital based case control design was adopted. 158 caretakers and their children who sought care later than three days (cases) were recruited and they were controlled by an equal number of caretakers and their children who sought care within three days (controls). The study was carried out at the Kenyatta National Hospital Paediatric Filter Clinic and the four medical paediatric wards. Subject recruitment was as depicted by figure 1 below.

Figure 1: Diagrammatic representation of subject recruitment



A triage system at the point of registration was employed to detect children with severe illnesses and a truncated history was used to determine the duration of the illness, from where it was determined through set inclusion and exclusion criteria whether a child was a case or control. It was not possible to match the cases specifically on the illness characteristics due to the heterogeneity of the symptom combination. Consecutive sampling method was used. A two stage questionnaire was administered to the primary caretaker. Consent to take part in the interview was first sought from the caretakers. A clinical documentation of the signs and symptoms was made using a structured data collection form. The emergency care of the child was not interrupted by the interview or other matters relating to the study. A pilot study was carried out in September 2007 to pretest the

questionnaire and involved ten caretakers who were not involved in the final analysis.

Cases were picked first based on illness severity (acute severe illness) defined by the presence of any of the following: severe dehydration, shock, severe palmar pallor, severe febrile illness (temp >39°C) in a 'toxic' looking child, severe respiratory distress, prostration (includes altered consciousness), and active convulsions at time of presentation to KNH which was anytime beyond 3 days after the recognition of illness. The caretakers' cue as to when they thought the child got ill was counted upon as the initial point of illness. Three days has been shown to be the average time lapse/ 'waiting time', taken by caretakers between onset of illness and visit to the health facility in two studies done in Kenya. (Kamat, 2006; Nyamongo 2002).

Data was entered using EpiInfo (Version 3.3.2, Centers for Disease Control and Prevention 2005, Atlanta, GA). The data was then cleaned and transcoded.

Statistical analyses were performed using Intercooled STATA (Version 9.2, Stata Corporation, College Station, TX).

Variables with P values less than 0.05 in the logistic regression were considered to have a significant multivariable association with the duration of illness before seeking care in KNH. Those with P values >0.05 and <0.10 were considered to provide weak evidence of multivariable association.

Results

Of the 316 caretakers interviewed, 301 were mothers, 7 fathers, 4 aunts, 3 grandmothers and 1 sister. Male children were 177 and girls were 139. Of the ill children in the study population, 8% succumbed to the illnesses while 92% were discharged home alive after varied lengths of hospitalization.

The demographic and social characteristics of the caretakers for children presenting to KNH before and after a lapse of three days from illness onset are presented in Table 1. None of the caretaker characteristics between the two groups achieved statistical significance ($p < 0.05$).

Table 1: Caretaker sociodemographic characteristics

Characteristic	Cases [Presented after 3 days (n=158) (%)]	Controls [Presented after 3 days (n=158) (%)]	OR	95% CI	p*
Mother is caretaker	150 (95)	151 (96)	0.87	0.26-2.82	0.79
Employment of mother					
Unemployed	108 (70)	98 (63)	1	0	0
Informal	29 (19)	34 (22)	0.77	0.42-1.42	0.37 †
Formal	17 (11)	23 (15)	0.67	0.32-1.40	0.25
Education of mother	83 (54) n=154	69 (45) n=155	1.46	0.91-2.34	0.1
Primary and below					
Mother age (Mean ± 1SD)	26.5 yr (± 5.4)	26.7 yr (±5.4)	0	0	0.79§
Mother is married	136 (86)	141 (89)	0.75	0.36-1.54	0.39
Employment of father					
Unemployed	6 (4)	5 (4)	1	0	0
Informal	54 (39)	52 (36)	0.87	0.20-3.64	0.82 †
Formal	78 (57) n=138	86 (60) n=143	0.76	0.18-3.11	0.65
Education of father	49 (36) n=138	38 (27) n= 143	1.52	0.89-2.62	0.11
Primary and below					
Fathers age (Mean ± 1SD)	32.5 yr (±6.3)	31.9 yr (±5.6)	0	0	0.40§
Residence in Nairobi	137 (87)	137 (87)	1	0.49-2.02	1
Religion is Christian	153 (96)	146 (92)	2.52	0.80-9.32	0.08
Both parents alive	136 (86)	141 (89)	0.75	0.36-1.54	0.39
Household size (less than 4 occupants)	101 (64)	88 (56)	1.41	0.88-2.27	0.14

*: Pearson's chi square (X²) test §: students t-test †: Pearson's chi square on a form of earning compared to no employment

Demographic and illness Characteristics of the children

The demographic characteristics of children brought within and after three days of symptom recognition were almost similar (Table 2). The table also shows the distribution of symptoms as reported by caretakers. It shows that cases had greater likelihood of having fever, cough or diarrhea as symptoms compared to controls. ($p=0.04$, 0.02 and 0.01

respectively). The distribution of the other symptoms is more or less similar among the cases and controls. There was essentially no difference in the gender distribution of children in the study ($p=0.91$) Cases were slightly younger than controls (7 months versus 10 months), and this was statistically significant on its own ($p=0.04$). However, after logistic regression, this significance was lost.

Table 2: Demographic and illness characteristics of the children

Characteristic	Cases [Presented after 3 days (n=158) (%)]	Controls [Presented after 3 days (n=158) (%)]	OR	95% CI	p§
Male sex	88 (56)	89 (56)	0.97	0.61-1.56	0.91
Age months (Median, IQR*)	7 (2-59)	10 (2-59)	0	0	0.04 μ
Birth order \leq 2	115 (73)	105 (66)	1.35	0.81-2.25	0.22
Siblings \leq 2	134 (85)	130 (82)	1.2	0.63-2.29	0.54
ANC visits <4	40 (25)	32 (20)	1.33	0.76-2.35	0.28
Immunization status uptodate	151 (96)	154 (97)	0.56	0.12-2.26	0.36
Symptoms					
Diarrhoea	88 (56)	64 (40)	1.9	1.18-3.04	0.01
Vomiting	79 (50)	66 (42)	1.39	0.87-2.23	0.14
Cough	98 (62)	77 (49)	1.72	1.07-2.76	0.02
Difficulty breathing	73 (46)	75 (47)	0.95	0.60-1.51	0.82
Fever	144 (91)	132 (84)	2.03	1.01-4.38	0.04
Convulsion	44 (28)	57 (36)	0.68	0.41-1.13	0.12
Refusal to feed	14 (9)	8 (5)	1.82	0.69-5.16	0.19
Difficulty rousing	4 (3)	5 (3)	0.79	0.15-3.77	1 \uparrow

§: Pearson's χ^2 , unless stated otherwise μ : Wilcoxon rank sum test *IQR = Inter-quartile range Two sided Fisher's Exact

Table 3 represents the key signs that marked severe illness as they occurred among the children. It can be seen that signs related to diarrhoea and vomiting (severe dehydration/shock), and difficulty in breathing (tachypnoea, chest wall indrawing) comprise the majority of severe illness conditions

among the two groups. High fever was also a prominent feature. It can be seen though that the total events in the two groups were just about equal. The events are more than the total number of subjects because multiple signs could and did occur in an individual child.

Table 3: Distribution of the major signs among the groups

Sign (Marker of severe illness) §	CASES N=158 (%)	CONTROLS N=158 (%)
Severe Dehydration/shock	102 (65)	98 (62)
Severe palmar pallor (+++)	15 (9)	8 (5)
Severe Febrile illness (Temp \geq 39°C) in a 'toxic' looking child	76 (48)	94 (59)
Severe Respiratory distress (include deep acidotic breathing, obstructed airway, \pm tachypnoea, chest wall indrawing, \pm cyanosis)	90 (57)	78 (49)
Prostration (<1 yr=unable to breastfeed/drink, older child unable to sit without support; altered consciousness)	46 (29)	32 (20)
Active convulsions at casualty department	24 (15)	30 (19)
Total events	353	340

§: Only one sign was needed to imply severe illness, but one child could have several signs \uparrow : Majority of shock seen in this study was primarily hypovolaemic in nature.

Care seeking route and options

The routes followed by the caretakers in seeking care during the current illness are tabulated in table 4. The same table also outlines the first steps taken by the caretakers when they realized the child was unwell. A univariate analysis of route done with the option of coming directly to KNH being taken

as the most appropriate baseline, showed that coming later than 3 days was associated with a OR of 53.8(CI 6.43-449.1), 5.73(CI 2.07-15.8) and 4.07(CI 1.96-8.44) if care given was herbal, pharmacy prescription/shop-bought medicine and private clinic consultation respectively.

Table 4: Univariate analysis of the routes to seeking care during this illness

Characteristic	Cases [Presented after 3 days (n=158) (%)]	Controls [Presented after 3 days (n=158) (%)]	OR	95% CI	p*
Route taken					
Home KNH	12 (8)	43 (27)	0.22	0.10-0.45	0.001
Home private clinic KNH	67 (42)	59 (37)	1.24	0.77-1.99	0.36
Home other public centre KNH	48 (30)	43 (27)	1.17	0.70-1.96	0.53
Home, Pharmacy/shop KNH	16 (10)	12 (8)	1.37	0.58-3.29	0.43
Home Herbal KNH	15 (9)	1 (<1)	16.5	2.46-321.2	0.0004 §
Initial action taken					
Rush to clinic the same day	21 (13)	62 (39)	0.24	0.13-0.43	0.001
Buy shop/Pharmacy med	55 (35)	37 (23)	1.75	1.04-2.95	0.03
Wait to see what happens	64 (41)	43 (27)	1.82	1.11-3.01	0.01

* Pearson's x²; §: Two sided Fisher's exact (some cells have numbers ≤5)

Logistic regression analysis

The relationships between the clinical and sociodemographic predictor variables and the promptness of coming to KNH were explored in a logistic regression model. Age and sex were included in this model to control for confounding due to their influence.

A saturated model was first made with all the parameters tested together. In this model, after sequential elimination through likelihood testing, only the route to seeking care, the initial step taken by the caretaker when child was unwell, and symptoms of cough or diarrhoea were found to be significant with a likelihood ratio test of ≤0.05. The final reduced logistic regression model is as shown in table 5 below.

Table 5: Results of logistic regression model. (95 % confidence intervals given in parentheses)

Parameter	Unadjusted OR*	Adjusted OR †	p- Value §
Cough	1.72 (1.10-2.69)	2.09 (1.23-3.56)	0.007
Diarrhoea	1.90 (1.21-2.96)	1.57 (0.91-2.73)	0.04
Fever	2.03 (1.01-4.04)	2.61 (1.42-3.02)	0.12
Any caretaker worries about KNH	1.72 (1.02-2.88)	1.63 (0.97-2.76)	0.06
Route followed			
Home. KNH	1	1	
Home. other Public health centre. KNH	4.00 (1.87-8.56)	3.72 (1.64-8.40)	0.002
Home. shop/ Pharmacy. KNH	5.73 (2.07-15.8)	3.15 (1.05-9.47)	0.041
Home. private clinic. KNH	4.07 (1.96-8.44)	3.30 (1.52-7.17)	0.003
Home. Herbs. KNH	53.8 (6.43-449.1)	41.7 (4.70-369.1)	0.001
Initial step taken by caretaker when child fell ill			
Rush to hospital/clinic	1	1	0
Buy med from shop/pharmacy	4.39 (2.30-8.38)	4.12 (1.98-8.54)	0.001
Wait to see what happens	4.39 (2.35-8.23)	4.10 (2.04-8.22)	0.001
Other action	3.32 (1.44-7.66)	2.96 (1.18-7.45)	0.02
Age	0.97 (0.96-1.00)	0.99 (0.97-1.01)	0.37
Sex	0.97 (0.63-1.52)	1.03 (0.62-1.71)	0.91

*: Unadjusted as in Univariate analysis; †: Adjusted for the other factors in the regression; §: Likelihood ratio test

Health Outcomes

Two outcomes were assessed in the study; the length of hospitalization and the survival outcome (i.e. mortality or not). The median number of days stayed as inpatient were 7 in the late presenting group compared to 5 in the early

presenting group and this was only weakly significant ($p=0.05$). It also can be seen that the late presenting group had a statistically significant likelihood of death compared to the early presenting group ($p=0.001$). Table 6 below presents these differences.

Table 6: Health Outcomes; length of hospital stay and survival outcome among the two groups

Outcome	Cases [Presented after 3 days (n=158) (%)]	Controls [Presented after 3 days (n=158) (%)]	p
Length of hospitalization in days (Median, IQR)	7 (1-84)	5 (1-71)	0.05#
Survival outcome			
Alive	137 (87)	153 (97)	0.001†
Dead	21 (13)	5 (3)	§

: Two Sample wilcoxon rank-sum test † : Pearson's X² [OR 0.21, 95% CI (0.07-0.62)] ; § : OR for dead [4.69 95% CI (1.62-14.6)]

Discussion

This study sought to address an observation that has been of concern in the paediatric clinical arena in Kenya's largest tertiary health care facility. The observation was that a good number of the acute severely ill children seen and attended in the hospital appear to have had an intriguingly long time with acute symptoms before being brought here.

Consequently, the level of illness in some of these children is so severe as to affect options of management and survival outcome. It is worth stating that over the years, many residents from within and near Nairobi used to bring their children including the 'not so ill' to be attended to in KNH, notwithstanding that this is a tertiary and referral institution. The hospital however has not actively required that ill children seen here must have been seen elsewhere, a situation different from the adult casualty department.

In this study, children brought later than three days (cases) presented more with symptoms of fever, cough or diarrhoea. A similar distribution of symptoms among children who died without being taken to hospital was also found in a study done in Kilifi in coastal Kenya (Snow et al, 1994). Mutai reported a frequency of cough and difficulty breathing in 33%, and of diarrhoea and vomiting in 44% of children recruited in a study in which she evaluated through autopsies the cause of death in children brought dead or dying shortly after arrival to KNH (Mutai, 1998). Studies done elsewhere have shown that caretakers consider symptoms such as cough, diarrhoea and fever as mundane and these cause delay in seeking care for what are potentially life threatening conditions such as malaria (Cunningham, 1990; Alonzo, 1979).

The route followed by the caretaker was highly significant in determining whether a severely ill child was brought early or late to KNH. Cases were less likely to come here directly from home as the first point of contact with a health provider than were controls. Of the cases, 92% exploited other options first compared to 73% among the controls. Of those who exploited other options first, there were more in the cases group than in the controls group who had been attended to by a trained provider of western medical care either in private clinics or

other health centers (73% vs 64%). The kind of care given to the children hitherto coming to KNH was in most cases unverified, because many of the children seen elsewhere had no referral letters, or when available, were too brief to be helpful at all. In Siaya, Renu found that only 58% of children who died in a village had been seen by a trained provider of western medical care. He also found that only 10% of those who died had been referred for higher level care after being seen in a lower health facility. (Renu *et al*, 2001).

In the current study, cases used shop-bought medicine and pharmacist prescriptions more often than controls [OR 1.37(CI 0.58 -3.29)]. Importantly too, a significant group among the cases resorted to herbal medicine (5%) [OR 16.5(CI 2.46-321.2)]. Even though this study lacked adequate statistical power to assess these explanatory variables, it does nonetheless depict a very common scenario that is encountered in every day clinical practice in the hospital. A Ghanaian study found that herbal remedies were the most frequently and readily elicited treatment for specific symptoms and illnesses (used in 77% of all episodes) (Hill et al, 2003). Renu found that 51 % of caregivers consulted traditional healers in a study of terminally ill children (Renu *et al*, 2001).

The progressive exhaustion of options seen in this study is a reflection of both the economic and cultural disparities seen in a large city like Nairobi where commercialization of medical services and mushrooming private practice is on the rise.

Traditional healers most of who stay in the slum areas of the city have also carved their niche in a subset of the population increasingly impoverished by dwindling finances and rising cost of living. On the initial steps taken by care takers when a child fell ill, more care takers in the cases group than in the control group said they waited to see how the illness would progress ($P=0.01$). The cases didn't react as fast as the controls who would rush the child to a clinic or hospital the same day the illness began. Instead they opted to buy medicine from shops and pharmacies. ($p=0.03$). Molyneux *et al* found that in coastal Kenya, most fevers treated outside the household were treated using medicine bought from shops

only or as the first option in 69% of cases. (Molyneux *et al*, 1999). In the slums of Nairobi, Nyamongo found that when mothers did not have enough funds to go to hospital, they resorted to purchasing Over the Counter (OTC) drugs cheaply as they looked for money in case the situation worsened. She also noted that mothers in the slums do not change healers in close succession and that they took their time to observe the situation before making a switch. (Amuyunzu *et al*, 2006). The current study avers to this scenario in that more caretakers in the case group than in the control group had bought medicine from shop and pharmacist first before seeking care in KNH.

Even though caretakers worried on cost, many confessed that the life of the child was preeminent to other considerations. This is in agreement with a study done in Tanzania that found that on the overall, while user fees deterred adult patients from seeking prompt treatment for their illnesses at a government health facility, the same was not the case with young children (Kamat, 2006).

In this study, it was found that the average duration of hospital stay was prolonged in those who came late than those who came early. The difference in length of stay in the two groups was weakly significant ($p=0.05$). We found out that, the risk of dying was about 4 times increased in the late presenting group (12% versus 3%). This was highly significant difference between the groups ($p=0.001$). Apparently, the initial 'golden hours' during which these patients would get maximum benefit from early and timely intervention to help them return to health are lost when there is a long duration before being brought to KNH. Another study done in Nigeria found a similar tendency (Nnadi & Kabat, 1984).

Conclusions

Late presentation for acute severe illness as seen in Kenyatta National Hospital is an interplay of a number of explanatory variables, and not simply due to lack of money to pay for health care as is commonly supposed. Many of the children brought late have had care being sourced in the peripheral facilities either from allopathic care providers or from alternative medicine practitioners.

Cough or diarrhoea are prominent symptoms that afflict those brought later than 3 days compared to those brought within three days. These symptoms are likely to be considered 'mundane' by many caretakers under normal life circumstances.

Late presentation to KNH is associated with increased likelihood of mortality and longer periods of hospitalization in comparison to early presentation among children aged 2-59 months admitted to Kenyatta National Hospital.

Recommendations

There is need to train health workers and practitioners in the peripheries to recognize when severely ill children need more intensive management for apparently "benign" symptoms such as cough, diarrhoea, and fever. Besides this, the new concept of community IMCI should be embraced and taught to caretakers to improve their care seeking habits.

A history concerning use of herbs at home should be regularly sought for by clinicians attending to severely ill children in KNH, especially those brought late as it may help to explain

some atypical presentations of their illnesses and inform treatment focus accordingly.

Other studies in this area looking at specific issues brought forth by this study are necessary, eg use of herbs in children and its implications etc.

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Conflict of interest

There are no conflicts of interest to be declared.

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