Pneumonia among children under five in Uganda: symptom recognition and actions taken by caretakers

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Abstract

Background: Pneumonia is a leading cause of death among children under five years of age. Pneumonia deaths could be averted if caretakers recognized the danger signs and sought appropriate treatment promptly.

Methods: We interviewed 278 caretakers in Mukono district Uganda, whose under-five children had suffered from probable pneumonia two weeks prior to the evaluation. Through structured questionnaires we assessed caretaker's knowledge about danger signs among under-five children with pneumonia and the actions taken to manage probable pneumonia using descriptive statistics. We also conducted in-depth interviews with caretakers and community health workers.

Results: Lower chest wall in drawing (a pneumonia specific danger sign) was mentioned by only 9.4% of the caretakers. Among the Integrated Management of Childhood Illnesses (IMCI) standard general danger signs, inability to feed was the most commonly cited danger sign (37.8%) followed by incessant vomiting (10.1%). No caretaker mentioned all the four standard general danger signs. In terms of actions taken, most caretakers offered drinks (49.6%) and traditional herbs (45.3%) while, 31.7% gave antibiotics.

Conclusions: Caretaker's knowledge about danger signs was inadequate in relation to the IMCI guidelines. Caretakers used both modern and traditional forms of treatment to manage pneumonia. Comprehensive interventions geared at increasing symptom recognition and improving health-seeking behavior are needed to reverse this trend.

Key words: Pneumonia, Knowledge, Dangers signs, Care seeking, Uganda.

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Introduction

Pneumonia is a leading cause of death among children under five years of age (U5s), causing roughly 1•6 million deaths per year[1] and is one of the biggest barriers to the attainment of the Millennium Development Goal (MDG) 4 –reduce child mortality by two thirds by 2015. Pneumonia deaths could be averted if caretakers recognized the symptoms and danger signs in children with pneumonia, sought treatment promptly[2] and offered appropriate home care to the children including adherence to prescription and proper feeding[3].

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A UNICEF/WHO report that examined the epidemiological evidence on the burden, distribution of pneumonia and the current levels of treatment and prevention globally, showed that only about 1 in every 5 caretakers know the danger signs of pneumonia. Also 1 in every 5 knew the two tell-tale or indicative symptoms of pneumonia: fast breathing and difficult breathing. In addition, only about half of the children sick with pneumonia receive appropriate medical care and, less than 20 per cent of children with pneumonia receive antibiotics[2].

Recognizing the symptoms of pneumonia is the first step in reducing deaths among children under five and caretakers play a critical role in recognizing pneumonia symptoms, its danger signs and in immediately seeking appropriate care for their sick children. Studies show that failure to recognize signs and symptoms of childhood illness prevents or delays care seeking[4-5]. Furthermore, the health belief model states that when symptoms are perceived as a threat to life, individuals will take action[6].

After recognizing symptoms, the second step is for the caretaker to take action including seeking appropriate medical care for a child with suspected pneumonia. Appropriate care, as defined by WHO and UNICEF, includes consultation with providers that can correctly diagnose and treat pneumonia, such as facility and formally trained community based health providers[2]. However, other supportive home based care such as increased fluids, appropriate infant feeding, and child warming by caretakers are important[7]. All these actions are critical elements to prevent child deaths[8].

The Integrated Management of Childhood Illnesses (IMCI) guidelines, define general and pneumonia specific danger signs which require that a sick child be managed quickly and referred immediately after the pre-referral treatment[9]. These general danger signs include: inability to feed, incessant vomiting, lethargy/unconsciousness and convulsions while the pneumonia specific danger signs include lower chest wall in drawing and stridor[10].

In order to encourage more appropriate involvement of families in pneumonia management, pneumonia control programs require information on caretakers' knowledge about pneumonia among U5s, the prevailing care seeking and home based care practices. This is critical in the design of evidence-based interventions to promote family involvement in appropriate care seeking and supportive home care.

This evaluation aimed to assess caretaker's knowledge about danger signs among U5s with pneumonia and the actions taken in the management of pneumonia in Mukono district, Uganda.

Methods

Evaluation setting

Mukono district is one of the districts implementing the Village Health Team (VHT) strategy in Uganda. VHTs are a cadre introduced by the Ministry of Health to mobilize communities and strengthen health service delivery at the household level[12].

Between July and August 2012, we conducted an evaluation using a cross sectional design in two sub counties of Mukono North health sub district (HSD) in Uganda; Nama a typically rural area and Mukono Town council an urban area. Mukono North HSD is 22 kilometers from the capital city Kampala with a population of 39248 U5s (Mukono district profile). Mukono North HSD was selected because it is the largest HSD in Mukono district and is composed of both rural and urban populations.

In 2011, pneumonia was the leading cause of death among U5s in Mukono district, with a case fatality rate of 5% (District HMIS 2010/2011). Integrated Community Case Management of Childhood illnesses (ICCM) was introduced in Mukono district two years prior to this evaluation. The ICCM programme includes case management through VHTs[11]. Under ICCM, VHTs are trained to identify, and assess childhood illnesses including pneumonia, malaria and diarrhea. The VHT are given a kit with pre-packaged medicines and diagnostic supplies to manage these common illnesses in order to reduce delays in accessing appropriate care[12], however the functionality has not been evaluated.

Sample size calculation

We estimated a sample size of 278 caretakers using the Kish Leslie 1965 formulae with the assumptions that; 86% of U5s receive cough treatment at home[13] as a proxy for the percentage of caretakers who provide some form of home care for pneumonia; a 5% precision and a 1.5 design effect.

Sampling procedure

Two of the four parishes in Mukono town council and three out of the six in Nama Sub County were randomly selected using a table of random numbers. Both urban and rural parishes were sampled to provide better representation of the district. From a total of 50 villages that were eligible for sampling in all the 5 parishes, 15 villages were selected.

Systematic sampling was used to select households with the eligible respondent who was a caretaker of a child below five years of age. A caretaker was defined as an adult who was found to be in custody or guardianship of the U5 at the time of the evaluation. If several adults were present at the time, the one with the closest relationship to the child was selected due to the decision making power that close relatives hold.

The total number of households in each of the selected villages was obtained from the Local Chairperson (LC-1) and the sampling interval was calculated for each village through dividing the total number of households per village by the number of households targeted for inclusion in each village. The LC-1's household was the starting point for sampling in each village.

To identify eligible respondents, caretakers were asked if the child or any of the children in the household had suffered from cough and fast breathing (probable pneumonia) locally defined as "*Lubyamira*" two weeks prior to that day. The caretakers, who affirmed to this, were enrolled if they consented to participate. If a household had no child who had suffered from cough and fast breathing two weeks prior to the evaluation, the next nearest household within the same direction was selected.

Data collection

Quantitative data was collected using a pretested structured questionnaire which was developed based on a modified optimal care seeking framework (OCSF) by Baume, with themes on symptom recognition, appropriate home care and monitoring, and treatment at a health facility[14].

The steps in the framework represent critical decision points at which performance of optimal behavior maximizes the likelihood that the illness will be resolved. For example, if a caretaker gives the correct antibiotics, in the correct dose with appropriate supportive care like breast feeding and keeping the child warm, the child is likely to recover, and it is not necessary to proceed with the other steps in the model. Conversely, failure to perform optimal behaviors at a given step can have serious consequences.

The questionnaire was administered to the caretakers in the local language (Luganda) by trained research assistants. Responses elicited included; most common childhood illnesses, knowledge about danger signs in children and actions taken by the caretaker when a child presents with cough and fast breathing. The responses were unprompted and caretakers were asked to mention all the options that they knew, followed with the prompt "anything else?"

After the quantitative survey, we conducted in-depth and key informant interviews to explain some of the findings observed. The reasons for the observed practices among caretakers were elicited through in-depth interviews with caretakers whose children had suffered from cough and fast breathing two weeks prior to the evaluation. Ten in-depth interviews were conducted including five from Mukono town council and five from Nama. Key informant interviews were conducted with five VHTs from each of the five rural villages that were randomly selected from Nama. The key informant interviews focused on the VHTs' experiences managing children with pneumonia, and their perceptions of the actions taken by the caretakers. No key informant interviews were conducted with VHTs from the urban area since no VHTs had been trained in the urban setting.

Ethics

Written informed consent was sought from each caretaker prior to the structured and in-depth interviews.
This evaluation was conducted as part of the Mukono district monitoring and evaluation activities to inform adjustments in the district interventions. Hence we did not obtain approval from the institutional review board but rather approval from the Mukono District Health Office. The evaluation was conducted under supervision of Makerere University School of Public Health

Data analysis

Questionnaires were entered in EPI data and analyzed in STATA version[10]. The unit of analysis was the U5 caretaker. Univariate analysis was done to present measures of knowledge about danger signs and actions taken including home management and seeking health care outside the home.

To assess caretaker's knowledge, the danger signs reported by the caretakers were compared to the standard IMCI guidelines and frequencies were used to present measures of knowledge and the actions taken by caretakers.
Qualitative data was analyzed by themes, emerging among caretakers and VHT members.

Results

Socio-demographic characteristics

Majority of the caretakers (96.4%; 268/278) were female and 82.4 % (229/268) were mothers of the children. Most of the caretakers were aged 21-35years, 45.0% (125/278) had attained secondary level education and 76.3% (212/278) were married (Table 1).

Table 1: Caretaker socio-demographic characteristics

VARIABLE	FREQUENCY N= 278	PERCENTAGE (%)
Sex		
Male	10	3.6
Female	268	96.4
Relations with U5		
Father	10	3.6
Mother	229	82.4
Other relative	39	14.0
Age of caretakers		
15-20 years	37	13.3
21-35	190	68.3
36-50	35	12.6
51-70	12	4.3
Do not know	4	1.4
Education level		
None	26	9.3
Primary	119	42.8
Secondary	125	45.0
Tertiary	8	2.9
Marital status		
Single	17	6.1
Married	212	76.3
Separated	36	12.9
Widowed	13	4.7
Occupation of caretaker		
Employed	29	10.4
Unemployed	102	36.7
Trading	79	28.4
Farming	68	24.5

Knowledge about danger signs among children with pneumonia.

Lower chest wall in drawing(a pneumonia specific danger sign) was mentioned by only 9.4% of the caretakers.

Among the IMCI standard general danger signs, inability to feed was the most commonly cited (37.8%) followed by incessant vomiting (10.1%) (Table 2).

Table 2: Danger signs among children under five suffering from pneumonia mentioned by caretakers

Danger sign	Frequency (n=278)	Percentage %
Pneumonia specific		
Lower chest wall in-drawing	26	9.35
Difficult breathing	22	7.91
General danger signs		
Severe weakness	181	65.11
Inability to feed	105	37.77
Incessant vomiting	28	10.07
High fever	23	8.27
Convulsions	18	6.47
Unconsciousness	14	5.04
Do not know any danger sign	36	12.95
	15	5.01

Others = red eyes, dehydration, diarrhea

Multiple responses were given

No caretaker mentioned all the four standard general danger signs. Many caretakers (65.1%) mentioned severe weakness, high fever (8.3%) and difficult breathing (7.9%) as danger signs, although these are not listed among the IMCI pneumonia danger signs.

Caretakers from the urban areas were more knowledgeable about danger signs compared to caretakers from the rural areas; 14.4% of urban caretakers mentioned lower chest wall in drawing compared to 6.7% of rural caretakers. Inability to feed was mentioned by 44.3% of urban caretakers compared to 33.9% of rural caretakers.

Caretakers' practices in the management of children under five years of age with probable pneumonia

About the actions taken when a child presents with cough and fast breathing, most caretakers mentioned giving drinks (49.6%;138/278) and various traditional herbs (45.3%; 126/278), followed by seeking care at a health facility/from a health care worker. Approximately one third (31.7%) of the caretakers said they give antibiotics (Table 3) while some mentioned the names of the drugs such as Amoxicillin and Ampicillin.

Multiple responses were given slightly more caretakers (46.1%) from the rural villages mentioned giving herbs compared to 44.3% from the urban villages.

Table 3: Care practices mentioned by caretakers of children under five suffering from Pneumonia

Home based care practices	Frequency (n=278)	Proportion reporting (%)
Give drinks	138	49.64
Give traditional herbs	126	45.32
Take child to the health worker	103	37.05
Give antibiotics	88	31.65
Give fruits	41	14.75
Give pain killers	31	11.15
Tepid sponging	31	11.15
Child warming	26	9.35
Breast feeding	18	6.47
Give raw eggs	10	3.60

Multiple responses were given

During the in-depth interviews, we identified that many caretakers use traditional forms of treatment instead of and in addition to conventional medicine.

In addition to the low use of antibiotics, there was wide spread use of traditional forms of treatment, such as herbs to manage pneumonia. Three out of the 10 caretakers who participated in the in-depth interviews said they gave their children local remedies as the first action. *"When I saw that the child was coughing and breathing heavily, I knew it was pneumonia/Lubyamira, so I got lemon, mixed with garlic and added egg yolk, and then I gave the child to drink"*. When asked if the child got better, the caretaker said "*after two days the child was not getting better, so I went to the local private clinic and asked for herbal syrup which I gave for three days because I trust herbal remedies, but the child also started getting temperature, then I went back to the same clinic and they gave me Ampicilin, and I saw improvement after four days*". When asked which medicine made the child better, she said "I think it is Ampicilin because it is only after using it, that I really saw improvement" (26- year old mother, rural).

Among the other 7 caretakers, 5 used other drugs like painkillers, which they procured from drug shops, with no provider consultation and only two said they visited a health worker as the first action. From the quantitative interviews with caretakers, 44.2% (123/278) knew about the existence of VHTs. None of the caretakers in the in-depth interviews had ever visited a VHT when their children were ill and one caretaker from an urban village said *"we do not know the VHTs, they are not active"*.

Qualitative interviews with the VHTs revealed several challenges especially the lack of medical supplies. Whereas the VHTs had been trained, they had not been given supplies to diagnose and treat sick children. One VHT from a rural village said *"I can only tell caretakers to go to the government health center since I do not have the drugs… we were promised drugs, but they have not been brought"*.

The caretakers also mentioned challenges in seeking care at health facilities, including long waiting time and drug stock outs. When the caretakers were asked where they get antibiotics from, two mentioned private clinics

(at a cost) while the rest mentioned both private and public facilities. However, those who mentioned public facilities said they faced challenges in trying to access the drugs due to long waiting time "*the government health center has drugs but we wait for long since the drugs are free, but sometimes they get finished and there are only malaria drugs*" (32 year old mother, rural).
Caretakers also cited stock out of antibiotics and other drugs, requiring them to go to private facilities. However, they also noted that the antibiotics are expensive at the private clinics and some said that they were unable to afford them "*we just buy the drugs from private clinics and they are expensive, so I have never used antibiotics on my child I just go buy Vitamin C, pain killers and cough reliefs and the child gets better*" (24 year old mother, urban).

One of the caretakers also noted that they did not need to have a prescription when purchasing drugs such as painkillers, syrups and antibiotics from the drug shops and private clinics.

Some of the reasons for the use of herbs that were cited by caretakers were the remedy being inexpensive, while the reasons for the use of antibiotics included trust in the health worker. One caretaker, a 40 year old mother from an urban village said "*children are complicated, I cannot just give them anything, I go to the health worker and I tell them how the child has been then they know best what to give, I do not give anything else*".

Discussion

This evaluation assessed knowledge and actions taken by caretakers of under-five children with probable pneumonia. The results show inadequate knowledge about danger signs among caretakers in relation to the IMCI guidelines.
There was also wide spread use of traditional forms of treatment to manage pneumonia and antibiotic use, not necessarily by prescription.

Caretakers were not seeking help from VHTs as expected from the programs in place, because the VHT system was not fully functional; for example training of VHTs in the urban setting had not yet been done. Thus it is not surprising that the caretakers were not aware of the existence of the VHT. Additionally, the trained VHT did not always have the required supplies as reported in the qualitative interviews. Caretakers also reported lack of medicines in health facilities among the challenges they faced. Whereas this study did not objectively assess availability of drugs in the facility, this perception by caretakers is important as it can negatively impact on the care seeking behavior.

The results are discussed using three themes from the OCSF by Baume; recognition of signs, appropriate home care and monitoring and treatment at the health facility

Step 1: Recognition of signs:

Over half; 67.6% of the caretakers mentioned pneumonia as one of the childhood illnesses which shows that many caretakers knew that pneumonia was a common childhood illness. This is important since perceptions about how common a disease is may have an influence on interpretation of severity, cause and actions taken by the caretakers[15].
Although caretakers knew some danger signs, improvement is needed since the caretakers were not able to mention the danger signs as outlined in the IMCI guidelines[8].
Inadequate knowledge and perceptions about danger signs have been noted in other studies and is a major concern because it may compromise health seeking behavior[5]. The health belief model shows that if symptoms are perceived as a threat (dangers signs), individuals take action[6]. However, a correct action taken (such as seeking care from the VHT) in this community may not have necessarily led to the desired interventions since this system was not fully functional, with the VHT either not trained or trained but with no required supplies.

Step 2: Appropriate home care and monitoring

All the caretakers reported carrying out at least one home based care practice, which concurs with findings that health care in developing countries occurs at home[7].The majority of the practices mentioned were related to feeding (fruits, drinks, and food), which can be beneficial but not sufficient for improvement of health outcomes for children with pneumonia if appropriate diagnosis and timely antibiotics are not administered by trained providers.

Even when caretakers accessed antibiotics, some did so without a prescription from a trained provider due to gaps in the regulatory mechanisms which make it possible to procure antibiotics without prescription from drug shops and private clinics in Uganda[16]. Some of the caretakers who went to health facilities also did so after trying other remedies and self-medication with inappropriate drugs or antibiotics. This process when protracted may result in delays in seeking care.

Other than low access to antibiotics and seeking of care from trained health workers, the use of other useful home support measures such as child warming, breast feeding and tepid sponging, was also very low, hence the need to promote an entire package of important home management and health care seeking practices[8].

Step 3: Treatment at the health facility

Since the district had a non-functional system for community case management of childhood illnesses, there was a gap in effectively linking the caretakers to the health facilities. This, among other reasons, may explain why the VHTs were never visited and the use of herbal remedies as the first action of care for the child.

Lack of the required supplies at the VHT level and at health facilities as well as other quality issues (e.g. long waiting time) also compromise the trust in the health system. Community education and mobilization efforts should thus be accompanied by improvements in the quality of care at the VHT and facility levels[17].

Limitations

This evaluation had some limitations. Assessing caretakers of U5s with probable pneumonia two weeks prior to the evaluation excluded those whose children had had several episodes but out of our time bracket. However restricting the inclusion to caretakers that had recently had this experience would reduce challenges with recall. Secondly, the care seeking questions in the quantitative survey were general and not specific to the actions taken at the last probable pneumonia episode, which makes appropriate and timely care seeking difficult to assess in a complete manner. In addition, classification of fast breathing and danger signs such as lower chest wall in drawing and lethargy were not objectively defined. Nevertheless, the evaluation provides useful information for program improvement in relation to symptom recognition and care seeking.

Conclusions

This evaluation highlights the challenges in care seeking for pneumonia in a district of Uganda, starting with inadequate knowledge about danger signs among children with pneumonia, insufficient home management practices and, potential for treatment seeking delays along the process. The gaps in the first-line community management system at the VHT level and perceived lack of medicines at the facility level may also exacerbate the poor health seeking behaviors. Comprehensive interventions geared at increasing symptom recognition, improving health seeking behavior and the quality of services at the community level and health facilities are needed to reverse this trend.

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Conflict of interest

We declare no conflict of interest.

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