

Detection and Management of Pneumonia by Community Health Workers – A Community Intervention Study in Rehri Village, Pakistan

Pages with reference to book, From 42 To 45

Aisha Mehnaz, A.G. Billoo, Tabinda Yasmeen, Kelash Nankani (Department of Paediatrics, Dow Medical College and Civil Hospital, Karachi.)

Abstract

This community based, case management intervention study was done to assess the effectiveness of Community Health Workers (CHWs) in case detection and management of pneumonia in children under five years of age. Twenty-two volunteers (school teachers and students) were selected as CHWs from Rehri village, in Sindh, Pakistan and trained on World Health Organization (WHO) recommended National Acute Respiratory Tract Infection (ARI) guidelines at the Department of Paediatrics, Dow Medical College, Civil Hospital, Karachi. The CHWs had no prior health education. The intervention was the use of CHWs to detect and manage pneumonia in children under five years of age in Rehri village. Two medical officers supervised the post-training activities of CHWs in the village during the study period. Between December, 1992 and May, 1993, 442 episodes of pneumonia (very severe disease 10, severe pneumonia 54 and simple pneumonia 378) were detected and managed by trained CHWs. The medical officers agreed with the CHWs for classification and treatment in 356 (81%) cases. This study suggests that in areas where there is a shortage of trained health care professionals, educated community members such as school teachers can be trained to detect and manage pneumonia in their community (JPMA 47:42, 1997).

Introduction

Pneumonia is one of the leading causes of morbidity and mortality in children in developing countries^{1,2}. In Pakistan, over 250,000 child deaths annually are attributed to acute respiratory infections (ARI) and an additional 170,000 to measles³. Pneumonia accounts for 28.5% of deaths in children under age 5 and constitutes two third of deaths due to ARI. Mortality is particularly high in the rural areas of Pakistan where the incidence of ARI is reported to be 30-35%⁴. One reason for the high ARI-related mortality is the limited access of 80% of the population of Pakistan to health facilities; specifically in rural Sindh and Balochistan where on average, patient has to travel upto 14 km to reach the nearest basic health unit (BHU). Even in areas where government health centres are accessible, existing facilities are underutilized⁴. There is also a dearth of trained professionals in the community (one doctor per 3,400 people)⁴. Community participation in health education and training is at present lacking in Pakistan. Only a small number of community health workers exist in the country. These CHWs can have an important role in case detection and management in Pakistan. Various studies have shown reduction in pneumonia related mortality when case detection and management is achieved through CHWs⁵⁻⁸. We believe that the results of these studies can be replicated in our setup. This study was conducted to evaluate the effectiveness of CHWs in case detection and management of pneumonia in their community after receiving training on national standard ARI case management guidelines⁹. This study was done to assess a way in which the national ARI programme implement community based programmes in other areas of Pakistan. This study fall inline with eighth five year plan which envisages to train 33,000 CHWs for 50,000 villages in Pakistan.

Material and Methods

Study site

This study was done in the fishing village of Rehri, situated 40 km east of Karachi on the bank of the Indus River delta. Rehri is semi-isolated, bounded on the south by the Indus and on the north by a cliff¹⁰. The entire village is divided into nine small blocks called paras. For our study we selected three paras, Mosani, Malkai and Khaskhaili. These paras had social and demographic characteristics similar to other paras in the village and were selected because they were close to the Community Health Center (CHC). The CHC was operated by the social organization of Rehri village in collaboration with the Department of Paediatrics, Dow Medical College and Civil Hospital, Karachi (DMC/CHK) and non-government organization (NGO) called the Health and Nutrition Development Society (HANDS). The total population of the village was 25,000 and total population in study paras was 8000 with 966 children under five years of age (based on a survey conducted by the Department of Paediatrics (DMC/CHK) in December 1992). The health service in the study area consisted of one mnby government. The BFHJ was situated outside the village and a physician was present at limited times.

Phase 1: Training Subjects

Twenty-two volunteers (12 females and 10 males) were selected as CHWs from Rehri. All but one were residents of the village. The CHWs were selected with the full approval of the village elders, chiefs, counsellor and school head masters.

The CHWs included 10 primmy school teachers, with an educational level ranging from 9-10 or 11-14 years of schooling. Twelve students with minimum education upto 6-8 years of schooling were also selected, These 22 volunteers were selected mainly because they were the only literate residents in the village. All agreed to work after school hours without salary.

Trainers

Training was conducted by four senior members of the teaching staff of the Department of Paediatrics, DMC/CHK. They were assisted by two non-resident medical officers (MO). The MO had atleast one year of training in paediatrics and both MOs had been trained as ART master trainers in workshops conducted for senior medical personnel. The MOs evaluated the performance of the CHWs after the training.

Training Methods

The CHWs were trained in a ten day training workshop at the Department of Paediatrics, DMC, CHK, on national AR! case management guidelines to detect and manage pneumonia in children under five years of age. The entire national ART manual, including the World Health Organization recommended guidelines on management of child with ARI9 and the national AR! poster was translated into Urdu (the national language) and Sindhi (the local language) for the training of CHWs. The Department of Paediatrics also developed a coloured poster giving home care advice on AR!. The video on ART prepared by WHO/UNICEF was also dubbed into Urdu for training of the CHWs. The training consisted of lectures, demonstrations and discussions, Maximum emphasis was placed on experiential training which included case detection and presentations in the wards and in the outpatient department. Clinical activities of the CHWs were closely observed by the trainers.

Pretest and Post-test

The training was preceded by a pretest to assess the existing knowledge, attitudes and practices (KAY) of the CHWs regarding ARI, especially pneumonia. The pretest. developed at the Department of Paediatrics, DMC, CHK, was based on the national ART case management guidelines. The same questionnaire was used at the end of training to assess the change in KAP of the CHWs regarding AR!.

Phase 2: Preliminary survey

In December, 1992, the 22 trained CHWs alongwith the two MOs carried out a prelirinamy survey of Rehri village to identify the intervention households.

Phase 3: Intervention Home visits:

CHWs were distributed among the three paras. Each worker was assigned 20-50 houses. The CHWs were instructed to visit 5-10 houses daily. In each visit they educated the mothers on how to recognize the signs and symptoms of pneumonia and instructed them to bring children under age five years with these signs and symptoms either to them or to the community health center. The CHWs supervised home management of simple cases of pneumonia, including drug administration. The information obtained for each child with pneumonia was entered in a standard proforma which was divided into three sections: assessment, classification and treatment. In the assessment section, the CHWs were instructed to ask questions about presence and duration of pneumonia and to look for signs of pneumonia in children. They recorded their information in the classification section. The CHW treated the child based on their assessment and classification and recorded this in the treatment section. Location of treatment (home or hospital referral) was recorded when treatment was prescribed at home and the type of antibiotic and dosing schedule were noted. The CHWs were provided with two antibiotics (co-trimoxazole and amoxicillin) and one antipyretic (paracetamol). They were instructed to give only these drugs. The proforma contained a separate section to be filled by the MO who evaluated the CHWs.

Evaluation of CHW's performance

Each CHW was supervised by one of the two MOs. The MOs visited the CHC daily and reviewed in detail the CHWs' performance from the previous day. The MOs re-examined each child classified by the CHW as having pneumonia either in the CHC or at home if the parents had not followed a recommendation to bring the child to the CHC. The MO examined the child and independently assessed the classification and management done by the CHW. If all three components of management (assessment, classification and treatment) were correct the case was considered to be correctly detected and managed. If any component of management was found to be incorrect the case was labelled as incorrectly detected and managed. The MO was also instructed to write his remarks at the end of the proforma. The signed proforma was then examined by the investigators together with the MOs to recheck the entry and validate the findings.

Data analysis

Data from the questionnaire completed by the CHWs and MOs were entered and analysed using EpiTnfo Version 5.1. Data are presented as frequency distributions.

Results

Between December, 1992 and May, 1993, 442 episodes of pneumonia (238 in male and 204 in female children under five years of age) were detected and managed by 16 trained CHWs (27.6 episodes/CHW). Five CHWs never worked after they received training in the ARI workshop and one worker, a teacher who was not a resident of the village, left after the training. Of the five CHWs who did not work, three were students, two left because they were studying and one left to spend time with his family. The remaining two teachers did not give the reason for leaving the study. Of the 442 episodes of pneumonia, the CHWs classified 10 (2%) as very severe disease, 54 (12%) as severe pneumonia and 378 (85.5%) as simple pneumonia (Table I). The MOs examined the children 0-24 hours later. The overall assessment, classification and treatment administered for various classification by the CHWs were correct in 356 (80.5%) cases (Table 1).

Table I. Correct case management of pneumonia by CHWs.

CHWs classification of pneumonia	Medical officers assessment of CHWs management (assessment, classification, treatment)					
	Correct		Incorrect		Total	
	No	(%)	No	(%)	No	(%)
Very severe disease	7	(70.0)	3	(30.0)	10	(2.3)
Severe pneumonia	47	(87.0)	7	(13.0)	54	(12.2)
Simple pneumonia	302	(79.9)	76	(20.1)	378	(85.5)
Total	356	(80.5)	86	(19.5)	442	(100)

The MO confirmed the assessment classification and treatment in 7 cases (70%) of severe disease, 47 (87%) cases of severe pneumonia and 302 (79.9%) of 378 cases of simple pneumonia. The 7 CHWs who were school teachers saw 329 (74.5%) cases: they assessed, classified, and treated 289/329 (87.8%) correctly. The nine CHWs who were students, saw 113(26%) cases and correctly assessed 67/113 (59.3%). Of the 86(20%) cases that were incorrectly classified or managed by the CHWs, assessment and classification were correct in 64 (74%), but treatment administered by the CHWs was incorrect (Table II).

Table II. Evaluation of CHWs performance in detection and management of pneumonia.

Community Health workers	Correct	Incorrect	Total cases seen by CHWs
	No	No.	No.
Teachers	289	40	329
Student	67	46	113
Total	356	86	442

Other errors are shown in Table III.

Table III. Analysis of incorrect management of pneumonia by CHWs.

Incorrect management (assessment &/or classification &/or treatment)	CHWs classification of pneumonia			
	Simple Pneumonia No.	Severe Pneumonia No.	Very severe Disease No.	Total No. (%)
Treatment	57	5	2	64 (74.4)
Assess+Class+Treat	14	1	0	15 (17.4)
Classification+Treat	4	0	1	5 (5.8)
Assess+Treatment	1	0	0	1 (1.2)
Classification	0	1	0	1 (1.2)
Total	76 (88%)	7 (8%)	3 (4%)	86

Of the 64 cases of incorrect treatment, the CHWs had selected correct antibiotics, but errors were made in the dosage and dosing schedule. These errors were corrected by the MOs. The CHWs identified 1059 cases of no pneumonia". Of these 1039(98%) cases were correctly assessed and managed by CHWs (on the basis of proforma. not evaluation). None of these "no pneumonia" cases died.

Discussion

This study has demonstrated that carefully selected CHWs can be trained to detect and treat simple pneumonia in children under 5 years of age. They can also be trained to identify and refer patients with severe or very severe pneumonia. These results are similar to results in community -based studies done in other developing countries^{7,11}. These studies indicate effective control of pneumonia need not depend solely on physicians. Our study shows that CHWs without previous health education can fulfill this role. The encouraging results of this study have resulted from careful selection and specialized training of CHWs. Selection of school teachers as CHWs may have contributed to the success of this study. School teachers were able to count respiration rates and enter the information on precoded proforma and may have skills in educating the mothers. To our knowledge, this is the only study in which school teachers have been selected and trained as CHWs. These CHWs were easily accessible to mothers for help and advice since they were residents of the same village and spoke their language. Use of school teachers can be viewed as an extension of education through mohalla (neighbourhood) mosques and schools. These institutes can play an important role in dissemination of health information and education. Teachers in neighbourhood schools, mosques and adult literacy centres may be able not only to detect and manage pneumonia, but also can assist with other important health priorities such as immunization, breast feeding and nutrition.

The teaching materials (Urdu and Sinthi translation) of WHO recommended case management guidelines on ARI9, national ART Chart, colour poster on home management and dubbed (Urdu) video on ART developed and prepared at Department of Paediatrics DMC/CHK may have been one ke to

successful training of CHWs. The experiential training offered to CHWs during the workshop and continuing education and supervision in the field trained MOs may have also improved performance of CHWs. Further analyses of 86 incorrectly treated cases in our study suggested areas for improvement in future extension of training programme on ART for CHWs. The major difficulty was in the calculation of drug dosage. The CHW prescribed 'under dosage' (they administered less than the recommended dosage). Under dosage may have resulted in poor response. We recommend that dose calculations be emphasized during the training and reinforced in the field by the trainers.

Although this intervention study created a high level of community awareness about childhood pneumonia, one major problem that our CHWs faced was failure of parents to follow CI-IWs recommendation to bring a sick child to the hospital. Only six of 64 cases of severe pneumonia and very severe disease were hospitalized. The rest were treated at home by the CHWs using the same antibiotics used for treating simple pneumonia. Our MOs intervened and changed the antibiotics if they noticed no improvement within 48 hours or less according to standard case management guidelines. Our project ensured an uninterrupted supply of medicine to CHWs so that the children could be treated even if parents refused to bring the child to the hospital for admission. To improve compliance, we recommend that the community should also be educated about childhood pneumonia and its sequelae if inappropriately treated.

Our study had several limitations. Firstly, upto 24 hours elapsed between the initial CHWs evaluation of the child and the MOs examination, clinical status and classification may have changed. This limitation cannot be assessed from our data, but as only 17 of the 442 (4%) cases were incorrectly classified, therefore, the conclusions of the study are not affected by these cases. Secondly, there was no examination by MO of the 1059 cases identified as "no pneumonia" by CHWs according to WHO recommended guidelines. Logistics and time constraints did not permit us to see all "no pneumonia" cases individually, although information on the proforma indicated that 98% were correctly assessed, classified and treated by CHWs. We were reassured that mortality in the "no pneumonia" cases was zero and none of the case identified as "no pneumonia" entered in the pneumonia categories later on. In future studies, a random subset could provide validation of "no pneumonia" classification.

We conclude that, in areas where there is a shortage of trained health care professionals, educated community members, such as school teachers, can be motivated and trained to detect and manage pneumonia in children in their community. It is critically important to evaluate the case management of these CHWs to ensure appropriateness of their care. CHWs may be able to play an important role in improving child survival in developing countries.

Acknowledgements

Financial support for this project was provided by the Applied Diarrhoeal Disease Research Project at the Harvard Institute for International Development by means of a cooperative agreement with the United States Agency for International Development (USAID). We gratefully acknowledge the contributions of Dr. Richard Cash for assistance in the development of the research proposal, Mr. Jonathon Simon for administrative support and expert advice during the project, Dr. Sheikh Tanveer and Dr. Mohammed Ashraf Memon for their support during the workshop and our 16 CHWs who worked voluntarily on this project. We are specially grateful to the people of Rehri village for their cooperation. Our special thanks to the mothers and children of Rehri village for their trust bestowed on us. We gratefully acknowledge the assistance and cooperation offered by Health and Nutrition Development Society (HANDS), during this project. Our thanks are also due to Miss Sajida Naqvi and Mr. Aslam Khan for their secretarial help.

References

1. Leowski, J, Mortality from acute respiratory infection in children under 5 years of age, Global estimates, World Health Stat. Q., 1986;39: 138-144.
2. Government of Pakistan, Health and Health related statistics of Pakistan. Islamabad, Planning Commission. Government of Pakistan, 1978, pp. 93-96.
3. Khan, M.A., Qazi, S.A. and Rehman, ON. Control of ARI in Pakistan. Present status and future development in ARI. National programme for the control of ARI in Pakistan. Edited by Khan, MA., Qazi, SA. and Peeperskom. R. Islamabad, Federal ARI cell. Ministry of Health, Government of Pakistan, 1990, p.32.
4. UNICEF A review of the situation of children. SAARC conference on South Asian children in cooperation with UNICEF, New Delhi, UNICEF, 1986, pp. 25-34.
5. Khan, A.J., Khan, J.A., Akbar, M et al. 'Acute respiratory infection in children. A case management intervention in Abbottabad District, Pakistan. Bull. WHO., 1990;68:577-585.
6. Bong, AT., Bang, R.A., Tale, O. et al. Reduction in Pneumonia mortality and total childhood mortality by means of community based intervention trial in Gadchiroli, India. Lancet, 1990;336:201-206.
7. Pandey, MR., Daulaire, N.M.P., Starbuck, ES. et al. Reduction in total under-five mortality in Western Nepal through community based antimicrobial treatment of pneumonia. Lancet, 1991 ;338 : 993- 997.
8. Fauveau, v. Stewark, M.K., Chakraborty, J. et al Impact on mortality of a community based program to control acute lower respiratory tract infections. Bull, WHO., 1992;70:109-116.
9. Management of the young child with acute respiratory infection. Ministry of Health, Government of Pakistan. Islamabad, Federal ARI Cell, Children Hospital, PIMS. In Collaboration with WHO and UNICEF Pakistan, 1990.
10. Amartric, F and Banuri, T Population, Environment and de- responsabilization. Islamabad. Sustainable Development Policy Institute, 1992.
11. Zeitz, P.S., Harrison, L.H., Loper, M. et al. Community Health Worker competency in management of acute respiratory infections of childhood in Bolivia. Bull. Pan. Am. Health Organ., 1993:27(2).