Management of childhood pneumonia by traditional birth attendants[*]

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In a field trial in Gadchiroli, India, we trained 30 paramedical workers (PMWs), 25 village health workers (VHWs) and 86 traditional birth attendants (TBAs) from 58 villages to diagnose childhood pneumonia and treat it with sulfamethoxazole + trimethoprim. Continued training, the development of a breath counter, and educative supervision progressively reduced errors in case management made by the TBAs. Over the 3.5-year period 1988–91, 2568 attacks of childhood pneumonia were managed and the case fatality rate was 0.9%, compared with a rate of 13.5% in the control area. The case fatality rates for the three types of worker were similar. The TBAs were superior to the other workers in terms of their availability, outreach, access to neonates, and cost. Satisfaction with the VHWs, TBAs, and PMWs was expressed by 85%, 69% and 18% of users, respectively. In the intervention area the mortality rate attributable to pneumonia among neonates declined by 44% (P <0.01) while the total neonatal mortality fell by 20%, presumably because of the involvement of TBAs in the control of acute respiratory infections (ARI). If adequately supported by the health system, TBAs can successfully manage childhood pneumonia in villages at the lowest possible cost and with a high degree of community acceptance. TBAs and VHWs are the most suitable community-based health workers for ARI control programmes in developing countries.

Introduction

In 1990, acute respiratory infections (ARIs) caused 33% of global mortality among under-5-year-olds.[a] Bacterial pneumonia, which can be treated with antimicrobial agents, accounted for most of these deaths (1). WHO recommends case management as the main strategy for reducing child mortality associated with such infections (2). This involves a simple standard plan for the management of children having a cough and/or respiratory difficulty, resulting in the early diagnosis and treatment of pneumonia.[b] Field trials have shown convincingly that the strategy is feasible and effective in reducing child mortality (3–6). Many developing countries have drawn up plans for introducing national ARI control programmes, and WHO, UNICEF, UNDP and approximately 60 countries recently resolved to launch

a global programme using case management as the main strategy (7).

Because of the shortage of physicians in rural areas, ARI control programmes have to train non-physician health workers in case management (7). In previous field trials, paramedical workers (PMWs) and village health workers (VHWs) have been trained to provide this service in villages (3, 5, 6). In a field trial in Gadchiroli, India, traditional birth attendants (TBAs) were trained in the case management of pneumonia (4). The present article assesses TBAs as providers of case management in ARI control and compares them with other types of community-based health workers.

Subjects and methods

The field trial was carried out in Gadchiroli, a remote underdeveloped part of central India, by the Society for Education, Action and Research in Community Health (SEARCH), a voluntary organization. Extreme poverty, a female literacy rate of only 11%, and poor means of communication characterize the area. In the villages, health care is provided by traditional healers and private medical practitioners as well as by government paramedical workers, of whom there are 2 per 3000 people.

A census and a baseline survey were conducted in an intervention area of 58 villages and in a control area of 44 villages with populations of 48 377 and

34 856, respectively, and a system of reporting vital events and causes of death was established (4). The inhabitants of the intervention area received extensive education, by means of audiovisual aids, on the signs and symptoms of pneumonia in children and on when to seek care; and health workers were trained to give case management.

Initially, only PMWs and VHWs were involved. The 30 PMWs in the intervention area were trained after it had been agreed with the government that the case management of pneumonia would be an extra responsibility for them and that no additional wages or incentives would be given. A total of 25 male VHWs, i.e., 1 per 2000 people in the intervention area, were selected and trained by SEARCH. Their customary duties were to maintain population registers, record vital events, and treat minor ailments such as scabies, wounds, aches and pains. They were paid on a part-time basis by SEARCH but no targets or incentives were given for the management of pneumonia. The PMWs and VHWs worked independently of each other in defined but overlapping populations.

In six sessions, each of 1.5 hours, both groups were trained to follow the standard plan of case management suggested by WHO (16). For a child with a cough or breathing difficulty this included the following:

— taking a history;

— counting the respiratory rate using a wrist-watch;

— looking for referral indications and, if they were present, referring the child; and

— diagnosing pneumonia and treating with sulfamethoxazole + trimethoprim syrup if the respiratory rate exceeded 50 per minute (age-specific criteria for the respiratory rate were subsequently introduced, as recommended by WHO).[c]

Both groups of workers were provided with sulfamethoxazole + trimethoprim syrup and with paracetamol and salbutamol tablets. Case management for childhood pneumonia became available in the intervention area in July 1988. Information about treated cases was recorded by the workers and verified 15 days later by field supervisors when they visited the families concerned. Parents, sensitized by the mass health education, began to seek care for children affected by ARI.

During the first 6 months of the intervention, outreach was limited because the 55 trained workers were based in 25 relatively large villages. Moreover,

although most deaths were among neonates, parents often failed to seek help for the treatment of sick neonates. To overcome these problems, we involved TBAs in ARI control, since they were more numerous and were already visiting mothers and newborn infants daily for 1–2 weeks after delivery.

The 91 TBAs in the intervention area were contacted and offered training by SEARCH; 86 of them joined the programme. An earlier study of local words for ARIs proved valuable in establishing communication with the TBAs, who were asked at the outset to describe their beliefs, practices, and experiences relating to coughs and breathing difficulties in children. After describing various traditional remedies, most TBAs stated that *dabba* or *dudhfulli* (childhood pneumonia) was a fatal disease for which there was no effective traditional remedy. This gave us an opportunity to train the TBAs in the diagnosis and management of children with pneumonia. As before, the training was provided in six sessions of 1.5 hours each. The following messages were emphasized:

— most coughs and colds do not need to be treated with modern medicine;

— fast breathing and/or respiratory difficulty are the most important clues in the diagnosis of pneumonia;

— a child with pneumonia should be treated with sulfamethoxazole + trimethoprim syrup;

— feeding should be continued; and

— referral indications should be looked for.

Almost all the TBAs were illiterate and only partially numerate, and consequently could not count respiratory rates. They were therefore asked to rely on their visual judgment of fast breathing (*lahak* or *dhapa*) and/or respiratory difficulty manifested by intercostal indrawing (*pacharya odhane*) or subcostal indrawing (*balkusha odhane*). The TBAs were shown children with normal and fast breathing, and a WHO video on ARIs proved very useful in cultivating visual judgment of fast or difficult breathing. The age-specific doses of sulfamethoxazole + trimethoprim and paracetamol were memorized by the TBAs who then practised their use with the help of games, role playing exercises, and chanting. Pictorial aids were developed to help the TBAs remember the correct doses and the opportunity was taken to retrain them in safe and hygienic delivery and the care of newborn babies. Probably the most significant aspect of the training was the informal homely atmosphere under which it was performed, in which the TBAs felt free to express themselves and learn. The TBAs received no honorarium or incentive money for case management. They were paid in cash or kind by the

family after performing a delivery. SEARCH paid the TBAs US$ 0.1 for each birth they reported.
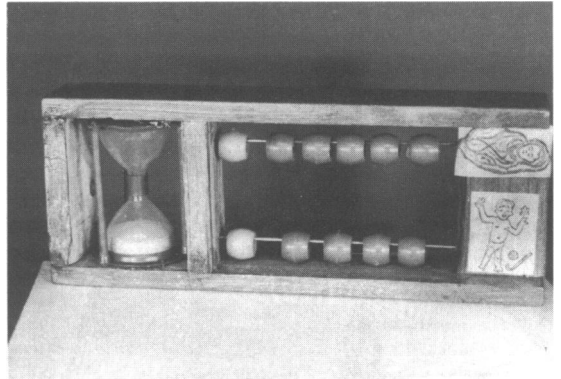
Beginning on 1 January 1989, 6 months after the other workers, the TBAs were given sulfamethoxazole + trimethoprim syrup and paracetamol tablets, and began managing children with a cough or breathing difficulties in accordance with the standard plan taught during training. A supervisor visited each child treated for pneumonia by a TBA within 15 days after treatment, completed the case record by interviewing the family and the TBA, decided whether any errors had been made, and used the opportunity to train the TBA further in correct case management. Regular monitoring revealed that fatalities among the cases treated by TBAs were clustered around eight attendants, three of whom had disabilities such as partial deafness, partial blindness and senile amnesia. These three TBAs were withdrawn from the programme.

Stocks of medicine were replenished by the supervisors on their fortnightly visits to TBAs or during monthly meetings. Meetings for review and continued education were organized once a month separately for the three types of worker. In one such meeting we compared the conclusions reached by TBAs on the basis of visual judgment with those made for the same children following counts of respiratory rates. There was agreement in only 59% of cases (8).

To help the TBAs to make correct diagnoses, we developed a simple breath counter (Fig. 1), consisting of a one-minute sand-timer and an abacus with two rows of beads; the first row, for infants up to 2 months of age, was of five green beads and a red bead; the second, for infants aged 2–11 months, was of four green beads and a red bead. The device was started by being turned upside down. The TBAs, most of whom were able to count up to 12, counted breaths in tens, and after every 10 breaths a green bead in the row appropriate to the age of the child was moved. If the red bead was moved before the sand had completely transferred from one bulb of the timer to the other the respiratory rate exceeded 60 per minute for babies aged up to 2 months or 50 per minute for those aged 2–11 months, which indicated pneumonia according to the revised age-specific criteria.[d] The device was tested on 10 TBAs by comparing the proportions of correct diagnoses of pneumonia in five children with borderline respiratory rates (WHO cut-off point ± 10 breaths) with and without the use of the breath counter.

In July 1991, community acceptance of the different types of worker was assessed by interviewing

Fig. 1. **The simple breath counter used in the study.**

a random sample of 128 families who had used the case management.

The vital events in the intervention and control areas were recorded prospectively by the VHWs; in addition, 6-monthly surveys were conducted, and verification of the reported results was provided by field supervisors. The causes of death in children were determined by verbal autopsy (9, 10).

Results

The personal characteristics, functions and wages of the three types of worker are compared in Table 1, while Table 2 shows their availability, outreach, and access to neonates. The case fatality rates, an indica-

Table 1: **Personal characteristics, functions, and wages of the different types of worker in the ARI control study, Gadchiroli**

	Type of worker:[a]		
	PMW	VHW	TBA
Number	30	25	86
Average age (years)	33	29	51
Gender	M/F	M	F
Education (years)	10	10	Zero
Previous health training	1.5 years	1 month	Zero
Experience (mean)	7 years	3 months	20 years
Functions performed[b]	1,2,4,5,6,7,9	1,5,8,9	1,2,3
Salary/honorarium (US$ per month)	70	3	0.12[c]

[a] PMW = paramedical worker; VHW = village health worker; TBA = traditional birth attendant.
[b] 1 = vital statistics reporting; 2 = maternal care; 3 = neonatal care; 4 = immunization; 5 = treatment of illnesses; 6 = family planning; 7 = control of communicable diseases; 8 = health education; and 9 = surveys.
[c] TBAs were paid US$ 0.1 for each birth reported, of which there were 15 per year, on average.

Table 2: **Availability, outreach, access to neonates, and case management by the three types of worker in the ARI control study, Gadchiroli, 1988–91**

	Type of worker:[a]			
	PMW	VHW	TBA	Total
No. of villages per worker (average)	1.9	2.3	0.67	
Population per worker	1 600	1 920	558	
No. of villages with workers based in them	14 (24)[b]	24 (41)	54 (93)	54 (93)
No. of pneumonia cases managed among under-5-year-olds	499 (19.4)	1 418 (55.2)	651 (25.4)	2 568 (100)
No. of neonatal pneumonia cases managed	7 (7.7)	33 (36.7)	50 (55.6)	90 (100)
No. of neonatal pneumonia cases managed as % of total cases managed	1.4	2.3	7.7	3.5

[a] PMW = paramedical worker; VHW = village health worker; and TBA = traditional birth attendant.
[b] Figures in parentheses are percentages.

tor of the quality of case management for treated children of different age groups, are shown in Table 3; since high-risk neonates were excessively represented among the cases managed by TBAs, the case fatality rates after exclusion of neonates and of cases managed by the three TBAs with learning disabilities are shown separately.

The errors made by TBAs in case management that were detected by the field supervisors are shown in Table 4. The proportion of error-free case management by TBAs increased as the programme continued from 56.7% in the first year to 68.6% and 83.4% in the second and third, respectively ($P<0.0001$). No information was obtained that would permit comparison of the knowledge and skills of the TBAs before and after training.

The proportions of users who were satisfied with their source of treatment and were prepared to seek care for pneumonia in future from the same workers were as follows: 84.5% for VHWs; 69% for TBAs; and 18% PMWs (the difference between VHWs and TBAs was nonsignificant).

As reported elsewhere (8) the proportion of correct diagnoses of pneumonia by 10 TBAs increased from 60% to 82% when the breath counter was used. It should be borne in mind that the cases in question involved borderline respiratory rates that were difficult to diagnose. Parallel treatment from other sources of care was infrequent; thus, among 121 infants aged under 2 months who were treated for pneumonia in the first 2 years of the study, referral or parallel treatment was sought for only two cases.

The significant decline in pneumonia-specific and total child mortality in the intervention area during the first year of the study has been reported previously (4). The cause-specific mortality rates among neonates in the control and intervention areas during the three years of intervention are shown in Fig. 2. There was a significant decline in the neonatal mortality rates due to pneumonia (44%) and birth asphyxia/injury (27%). The total neonatal mortality rates between July 1988 and June 1991 were 78.7 per 1000 live births (254/3226) and 62.8 per 1000 live births (290/4620) in the control and intervention areas, respectively ($P <0.01$).

Discussion

The TBAs played an important role in providing case management of childhood pneumonia in the

Table 3: **Case fatality rates for pneumonia cases managed by the three types of worker, 1 July 1988 to 31 December 1991**

	Case fatality rate, by worker:[a]							
Age group	PMW		VHW		TBA		Total	
0–29 days	1/7	(14)[b]	3/33	(9)	8/50	(16)	12/90	(13.3)
1–11 months	0/257	(0)	3/594	(0.5)	2/282	(0.7)	5/1 133	(0.44)
12–59 months	0/235	(0)	4/791	(0.5)	3/319	(0.9)	7/1 345	(0.5)
0–59 months	1/499	(0.2)	10/1 418	(0.7)	13/651	(2)	24/2 568	(0.9)
1–59 months (neonates excluded)	0/492	(0)	7/1 385	(0.5)	5/601	(0.8)	12/2 478	(0.5)
Excluding neonates and those cases managed by three TBAs with learning disability[c]	0/492	(0)	7/1 385	(0.5)	3/584	(0.5)	10/2 461	(0.4)

[a] PMW = paramedical worker; VHW = village health worker; and TBA = traditional birth attendant.
[b] Figures in parentheses are percentages.
[c] Deafness, blindness, and senile amnesia.

Table 4: Types of error made by traditional birth attendants (TBAs) and the associated case fatality

Type of error	No. of errors among all cases managed by TBAs (n = 709)[b]	No. of case fatalities in pneumonia cases managed by TBAs (n = 651):[a]		
		In cases with error	In error-free case management	P
Indicated case not referred	29 (4.1)[c]	5/27 (18.5)	5/479 (1)	<0.001
Wrong dose of sulfamethoxazole + trimethoprim	100 (14.1)	4/95 (4.2)	5/479 (1)	<0.05
Advised sulfamethoxazole + trimethoprim for wrong number of days	32 (4.5)	1/22 (4.5)	5/479 (1)	NS[d]
Dispensed sulfamethoxazole + trimethoprim without seeing the case	15 (2.1)	0/10 (0)	5/479 (1)	NS
Did not advise oral rehydration therapy for associated diarrhoea	18 (2.5)	0/15 (0)	5/479 (1)	NS
Other	27 (3.8)	1/23 (4.3)	5/479 (1)	NS
Prescribed sulfamethoxazole + trimethoprim for simple cough or in absence of a respiratory symptom	44 (6.2)	—	5/479 (1)	—
Child >5 years of age	17 (2.4)	—	5/479 (1)	—

[a] Cases in which the child was aged over 5 years and/or cases with pneumonia are excluded.
[b] There was more than one error in some cases; they are counted in each instance.
[c] Figures in parentheses are percentages.
[d] Not significant.

study villages. They were available in almost every village, enjoyed cultural access to neonates (the infants most at risk of dying from pneumonia), and provided their services at a lower cost than did other workers. When properly trained and backed up, the TBAs successfully managed cases of childhood pneumonia, thereby substantially reducing pneumonia-specific as well as total neonatal mortality. Their community acceptance was high, although second to that of the VHWs. TBAs were a universal response of the rural communities to their health needs in the past. They have been trained and used in modern maternal and child health care programmes in many parts of the world and should certainly be involved in ARI control programmes.

Table 2 illustrates the availability and outreach advantages of TBAs: a relatively low population/ worker ratio; their presence in almost every village; and the only community-based health workers in almost half the villages, invariably the smaller, isolated communities that otherwise were deprived of health care. In the larger villages the TBAs supplemented the work of the VHWs and the PMWs.

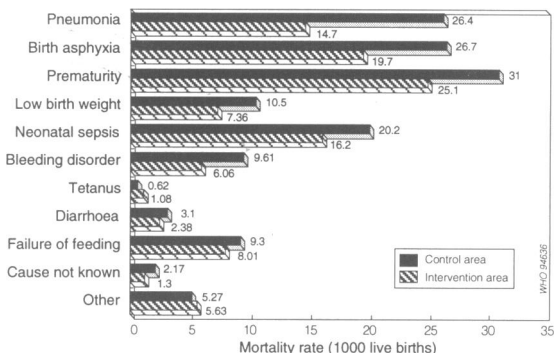The TBAs also had better access than other workers to neonates. This is important, since WHO considers that neonatal pneumonia should be accord-ed the highest priority in ARI control programmes.[e] In the control area, 59% of the deaths from childhood pneumonia were among neonates (4). Traditionally, neonates, even if they are ill, are not taken out of their homes to attend medical facilities; only the TBAs enjoyed ready access to them. As can be seen in Table 2, 55.6% of the management of neonatal pneumonia was provided by TBAs, compared with 36.7% by VHWs and 7.7% by PMWs.

In the intervention area, mortality caused by pneumonia in neonates was reduced by 44% (Fig. 2). This field trial is the first to have reported a significant reduction in pneumonia mortality in the neonatal period (11). Since previous trials involving VHWs and/or PMWs have not reported such an effect, we infer that the reduction was attributable to the TBAs.

Neonatal mortality due to other causes, for example, birth asphyxia and prematurity, also declined, although to a smaller extent (Fig. 2). This could have resulted from the training of the TBAs in

Fig. 2. **Cause-specific mortality rates among neonates in the control and intervention areas, 1988–91.** Pneumonia, $P < 0.001$; birth asphyxia, $P < 0.05$; others not significant.

estimated indirectly for cases of childhood pneumonia in the control area (4) using the relationship:

$$\frac{\text{Total pneumonia deaths in children}}{\begin{array}{l}\text{Total number of expected attacks of}\\ \text{pneumonia in children estimated from}\\ \text{a parallel morbidity study on a subsample}\end{array}}$$

By treating 651 cases of pneumonia, TBAs prevented at least 75 deaths, since there were 88 expected ($651 \times 13.5\%$) and 13 actual case fatalities. Even this is an underestimate because an overall case fatality rate of 13.5% in the control area was assumed even for neonatal pneumonia, which has a fatality level of 22–55% among cases treated in hospitals in India (13–15).

● The case management by the TBAs was 74% error-free, one or more errors being made in the remaining 26% of cases (Table 4). Although such detailed data were not available for the VHWs and PMWs, it was clear that the proportion of errors in their management was low. Many errors made by the TBAs were minor and did not affect outcome. There were, however, two important errors: failure to refer when it was indicated; and the administration of incorrect doses of sulfamethoxazole + trimethoprim by parents. More emphasis on the recognition of referral criteria should therefore be made during training. However, it should be noted that parents often refused referral, despite the advice of the TBAs, who were consequently forced to manage cases as best as they could. Since most of the babies needing referral were neonates, of whom the majority were managed by the TBAs, this problem was more frequently experienced by them than by the other workers. Moreover, the TBAs worked in the least accessible villages, where referral was particularly difficult.

Thus a large proportion of the higher case fatality rate among cases managed by TBAs arose because they dealt more frequently with cases of high-risk neonatal pneumonia than did the other workers and because they worked under relatively difficult circumstances.

Two measures improved the quality of care given by TBAs. First, with continued training, educative supervision and experience, the proportion of error-free case management by TBAs increased from 56.7% in the first year to 83.4% in the third year. Second, the breath counter improved the accuracy of diagnosis from 60% to 82% in a sample of 10 TBAs; it provided a quantitative basis for diagnosis and gave a definite end-point.

improved neonatal care and the continued contact with the neonates. It could also have been a consequence of successful pneumonia management, since many premature or asphyxiated babies would otherwise have died of associated pneumonia. The overall effect was a 20% reduction in neonatal mortality, a reliable estimate of the impact since the baseline comparability of the intervention and control areas was established previously (12).

The case fatality rates among children aged up to 59 months who were treated for pneumonia by PMWs, VHWs and TBAs were 0.2%, 0.7%, and 2%, respectively. Three factors explain these marginal differences, as discussed below.

● The TBAs managed a higher proportion of cases of neonatal pneumonia (Table 2), which has a higher risk of fatality. After excluding the neonates, the case fatality rates among children aged 1–59 months were 0% for PMWs, 0.5% for VHWs, and 0.8% for TBAs ($P < 0.5$).

● Each VHW was selected from several candidates, whereas all the TBAs who wished to do so were allowed to join the programme. The three TBAs with learning difficulties were poor performers and were associated with a case fatality rate of 24%. In future, such TBAs should be excluded at the beginning of training. To make a fair comparison, we excluded the cases of neonatal pneumonia and the cases managed by TBAs with learning disability (Table 3). The case fatality rate among the 584 cases managed by the remaining 83 TBAs was 0.5%; the corresponding values for PMWs and VHWs were 0% and 0.5%, respectively ($P < 0.5$). It should be noted that even the crude case fatality rate of 2% for the cases managed by TBAs was much lower than the 13.5% rate

Community acceptance weighs heavily in selecting a type of health worker. VHWs were the most popular and most frequently used source of case management, followed by TBAs. Of the total of 2568 treated cases, 55.2% were managed by VHWs, 25.4% by TBAs, and 19.4% by PMWs. The users expressed the same order of preference: 85% were satisfied with VHWs, 69% with TBAs, and 18% with PMWs. VHWs were preferred because they were from the community and were more readily available than PMWs; they provided medicines for other illnesses as well, and were able to count breaths by means of a wrist-watch, something the TBAs could not do. The TBAs fared well because they were the most accessible workers and were willing to help; they liked their new curative role since it enhanced their social status and self-image. Their enthusiasm to learn and provide case management partly compensated for their lack of education, and their comparatively small share of cases (25.4%) was to some extent explained by their late introduction into the programme.

The PMWs were the least used and least preferred group, although their case fatality rate was the lowest. The reasons for this, as stated by the users, were as follows: PMWs were often absent, uninterested or unwilling to walk an appreciable distance to see sick children; and they were perceived as being concerned mainly with family planning and immunization activities. The PMWs explained that they were already burdened by a whole range of functions, and that their supervisors placed no pressure on them to carry out ARI case management. Although they liked this new curative task they were not in a position to accord it high priority.

Wages form the largest component of the cost of health care. These were almost zero for the TBAs, low for VHWs, and highest for the government PMWs who, however, performed other functions as well (see Table 1).

Since childhood pneumonia requires urgent treatment and because a part-time worker may not always be available or acceptable to the whole community, training more than one such worker in each village is desirable. We trained an average of 2.3 workers per village during the study period. The PMWs, employed from outside the villages and who were often absent, were not really community-based. In this respect, the VHWs and TBAs were superior to the PMWs for the ARI control programme.

Some of the difficulties and limitations that were encountered with the TBAs, together with possible solutions, are discussed below.

● Illiteracy; reduced by using different training methods, memory aids, and continued training and supervision.

● An inability to count respiratory rate meant dependence on visual judgement, which can be overcome through the use of the breath counter.

● Many management errors were innocuous, having no effect on outcome; however, referral and the administration of correct doses needed more attention.

● Probably the most important problem would be the low status accorded to TBAs by the health care system, which often regards them as cheap, substitute labour of poor quality. There is a wide cultural and psychological chasm between the TBAs and the health care system and a tremendous effort will be required by the health care system to be able to work productively with TBAs and to help the TBAs reach their full potential.

The TBAs felt very relaxed during the training sessions organized by SEARCH and said that attending them was like visiting their parents' homes. Initially, this emotional bond was crucial for their involvement, and once properly trained and confident they rapidly gained social acceptance. The TBA in one village was so popular as the provider of ARI case management that children with pneumonia were referred to her from eight to ten surrounding villages, even by rural medical practitioners. Also, in another village a TBA successfully managed a case of neonatal pneumonia that a private doctor in the town had failed to treat.

Although their role as providers of health care may vary from place to place, the TBAs could become an important source of case management of pneumonia in children, their special advantages being availability, outreach, access to neonates, community acceptance, and low cost. If TBAs are adequately supported by the health system, their work could substantially reduce neonatal mortality caused not only by pneumonia but also by other causes. They should be involved in the case management of pneumonia, and careful attention should be given to their needs for special training and support. TBAs and VHWs form the best possible combination for providing community-based case management in the ARI control programme.

Acknowledgements

Résumé

Prise en charge de la pneumonie infantile par les accoucheuses traditionnelles

Dans le monde, 33% des décès chez les moins de 5 ans sont provoqués par des infections respiratoires aiguës (IRA). Pour faire face à la situation, l'OMS a préconisé une stratégie de prise en charge des cas. Jusqu'ici, le personnel paramédical ou les agents de santé de village avaient été employés pour mettre en œuvre cette stratégie au niveau du village. Dans la présente étude, on s'est intéressé à la prise en charge de la pneumonie infantile par les accoucheuses traditionnelles et on a comparé leurs résultats à ceux du personnel paramédical et des agents de santé de village.

L'étude a été menée à Gadchiroli, en Inde; 30 membres du personnel paramédical gouvernemental, 25 agents de santé de village attachés à la Society for Education, Action and Research in Community Health (SEARCH) et 86 accoucheuses traditionnelles, formées à diagnostiquer une pneumonie chez l'enfant au moyen des critères simples proposés par l'OMS et à la traiter par le sulfaméthoxazole + triméthoprime y ont participé. Ces accoucheuses ont été formées par des méthodes informelles et on leur a fourni un appareil simple permettant de compter les respirations.

Les accoucheuses se sont avérées supérieures au personnel paramédical et aux agents de santé de village dans les domaines suivants: présence jusque dans les villages les plus reculés, accès aux nouveau-nés et coût. Elles étaient présentes dans 93% des villages, ont prodigué 56% des traitements contre les pneumonies néonatales et n'ont coûté que US$ 0,12 par mois, contre US$ 3 par mois pour les agents de santé de village et US$ 70 par mois pour le personnel paramédical.

Le taux de létalité général pour les 2568 cas de pneumonie infantile pris en charge par ces trois types de personnel a été de 0,9%. Après exclusion des cas à haut risque, ces taux de létalité sont les mêmes pour les trois catégories de personnel. Grâce à la formation que les accoucheuses traditionnelles ont reçue et à la supervision dont elles ont fait l'objet, la proportion des cas qu'elles ont pris en charge sans commettre d'erreur s'est améliorée, jusqu'à atteindre 83% au cours de la troisième année d'intervention. Le fait de ne pas transférer les malades en temps utile et d'utiliser des doses incorrectes de sulfaméthoxazole + triméthoprime sont des erreurs qui ont eu des conséquences graves sur l'issue de la maladie. Les croyances des parents concernant les nouveau-nés, la non observance des conseils dispensés par les accoucheuses et les difficultés de transfert des malades dans les villages reculés ont été en partie responsables des erreurs commises.

Au cours de la période 1988–1991, la mortalité néonatale par pneumonie a baissé de 44% et la mortalité néonatale totale de 20% dans la zone d'intervention, par rapport à la zone témoin. On a observé d'autres diminutions (plus petites) des taux de mortalité liée à d'autres causes, telles que l'asphyxie à la naissance et la prématurité, qui résultent de la meilleure technique des accoucheuses et du traitement de la pneumonie qui peut leur être associée.

Une enquête a révélé que 85% des utilisateurs étaient satisfaits des agents de santé de village, 69% des accoucheuses traditionnelles et seulement 18% du personnel paramédical. Ce personnel paramédical, constitué d'employés du gouvernement à temps complet, est souvent inatteignable lorsqu'on en a besoin pour la prise en charge d'une pneumonie et est surchargé par ses nombreuses autres attributions; ce qui explique surtout la meilleure acceptation des agents de santé de village et des accoucheuses traditionnelles est leur plus grande disponibilité.

Les accoucheuses traditionnelles étant pour la plupart illettrées, il a fallu les former correctement sous supervision étroite; leur capacité limitée à compter a été surmontée par l'introduction d'un appareil servant à compter les respirations. Le principal obstacle que l'on pourrait rencontrer pour faire participer les accoucheuses traditionnelles à la prise en charge des cas d'IRA est peut-être le fossé culturel qui les sépare des autorités sanitaires et il conviendra de faire les efforts voulus pour faire évoluer la situation.

Les résultats de cette étude indiquent que les accoucheuses traditionnelles et les agents de santé de village constituent le personnel le mieux à même d'appliquer les programmes de lutte contre les IRA dans les pays en développement.

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