Evaluation of quality of ARIC standard case management provided by health care workers

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Rattanadilok Na Bhuket T, Sunakorn P, Pongparit S, Kasetchareon Y, Walaisathein T, Prasarnthong R. Evaluation of quality of ARIC standard case management provided by health care workers. Chula Med J 1997 Apr; 41(4): 265-76

Objective	:	*To evaluate the quality of providing ARIC standard case management by health care workers and health facilities.*
Setting	:	*Twenty nine district hospitals and 48 health centers in Ubonrajchathani, Saraburi, Surin, and Yala Provinces.*
Research design	:	*Cross-sectional descriptive*
Patients/material	:	*Under five years of age children with cough and/or difficult breathing who received services at the above mentioned hospitals and centers during 9-20 January 1995.*
Methods	:	*Each of the patients enrolled was examined and given treatment by local health workers and then again by surveyors. The results of the examination, diagnosis, and treatment provided by the surveyors (following ARIC standard case management) will be*

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used as standard criteria for measuring the quality of ARIC case management provided by health workers. The availability of essential drugs and the ARIC recording logbooks were also surveyed. Descriptive statistics (percentages and frequency) were used for analysis of major indicators for the quality of the health workers and the health facilities. Cross-tabulation was used to analyse the agreement of examination, diagnosis, and treatment between the local health workers and the surveyors.

Results : A total of 77 health facilities and 563 cases of acute respiratory infection were examined. The agreement on disease classification between the surveyors and the local health workers among all of 563 cases was 80.5%. Local health workers gave correct treatment for 57.9% of the pneumonia cases. Thirty-four percent of the non-pneumonia cases were given overtreatment with antibiotics. Ninety-eight percent of the health facilities were able to provide ARIC standard case management.

Conclusion : The quality of the health facilities for providing ARIC standard case management was satisfactory high. In contrast, the quality of local health workers for providing ARIC standard case management was unsatisfactory and needs to be improved.

Key words : ARIC, standard case management, quality, health care workers.

วัตถุประสงค์	:	เพื่อประเมินผลคุณภาพของบุคลากรทางการแพทย์และสาธารณสุขในการให้การบริบาลมาตรฐานโรคติดเชื้อเฉียบพลันระบบหายใจในเด็ก
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วิธีการศึกษา	:	ผู้ป่วยที่อยู่ในการศึกษาจะได้รับการตรวจรักษาโดยบุคลากรทางการแพทย์และสาธารณสุข ณ สถานพยาบาลแต่ละแห่งตามปกติ โดยผู้ป่วยจะได้รับการตรวจและให้การรักษา (สมมุติ) อีกครั้งโดยทีมสำรวจซึ่งเป็นกุมารแพทย์ที่ได้รับการอบรมการบริบาลมาตรฐานมาแล้ว โดยผลการตรวจรักษาของทีมสำรวจจะถือเป็นเกณฑ์มาตรฐานในการเปรียบเทียบและวัดคุณภาพการให้การบริบาลผู้ป่วยโรคติดเชื้อระบบหายใจในเด็กที่ทำโดยบุคลากรทางการแพทย์และสาธารณสุขของสถานพยาบาลเหล่านั้น การจัดหาและความเพียงพอของยาจำเป็นและการบันทึกการเจ็บป่วยของผู้ป่วยโรคติดเชื้อในระเบียนรายงานจะได้รับการสำรวจเช่นกัน การวิเคราะห์ดัชนีหลักของทั้งคุณภาพของสถานพยาบาลและบุคลากรทางการแพทย์และสาธารณสุขในการให้การบริบาลผู้ป่วยใช้ร้อยละและความถี่ cross tabulation ใช้ในการวิเคราะห์ความตรงกัน (agreement) ของการประเมินอาการป่วย, การวินิจฉัยและการรักษาระหว่างทีมสำรวจ และบุคลากรของสถานพยาบาล

ผลการศึกษา : การสำรวจมีจำนวนสถานพยาบาล, ผู้ป่วยโรคติดเชื้อระบบหายใจ และผู้ป่วยปอดบวมทั้งสิ้น 77 แห่ง และ 563 รายตามลำดับ มีความ เห็นตรงกันในด้านการวินิจฉัยผู้ป่วยทั้งหมดระหว่าง บุคลากรของ สถานพยาบาลและทีมสำรวจ ร้อยละ 80.5 บุคลากรของสถานพยาบาล ให้การรักษาผู้ป่วยปอดบวมทุกความรุนแรงถูกต้องร้อยละ 57.9 และ ให้การรักษาผู้ป่วยโรคหวัดเกินความจำเป็นด้วยยาปฏิชีวนะร้อยละ 34 ร้อยละ 98 ของสถานพยาบาลสามารถให้การบริบาลมาตรฐานโรคติด เชื้อระบบทางเดินหายใจในเด็กได้

สรุป : คุณภาพของสถานพยาบาลในการให้การบริบาลมาตรฐานโรคติดเชื้อ ระบบหายใจในเด็กสูงเป็นที่น่าพอใจ ในขณะที่คุณภาพของบุคลากร ทางการแพทย์และสาธารณสุขยังต่ำกว่าเป้าหมาย

Acute Respiratory Infections in Children (ARIC) is a major health problem in Thailand with high morbidity, mortality and excessive use of unnecessary drugs.[1] Serious lower respiratory infections, mainly pneumonia, rank as the leading cause of deaths among infecious diseases of children under five.[2]

The management of ARI has been modified from the WHO module,[3,4] and a 2-day training course for health workers was developed in 1989. The ARI prevention and control program was launched in 1990 with a definite national plan and in 1993 the program covered the whole country. In other words, since 1993 doctors and nurses at the district level and health care workers in every health center have had the ability to provide ARI standard case management to sick children.[5]

We wished to evaluate the quality of ARIC case management provided by health care workers who had already been trained and assess the health facilities regarding the provision of ARIC standard case management. The objectives of this study were to determine the quality of ARI case management at first-level health facilities in term of the quality of the health care facilities and the competance of the health care workers in providing ARI standard case management, and also to determine weaknesses and problems that may impede standard case management.

Materials and methods

One survey team visited one health facility (either a health center or a district hospital) each day to observe all ARI cases of children under five years who were examined by local health workers, and to interview all caretakers of ARI patients and all health workers dealing with ARI. The drug supply was checked, ARI cases previously visited rechecked and the treatment was also reviewed from the logbooks.

- Surveyors who observed health workes' practice on SCM were called "surveyor-1".

- Surveyors who re-examined the children (after the children were examined by health workers) were called "surveyor-2". The results of examinations made by surveyor-2 were used as the gold standard. All of the surveyor-2 personnel were well-trained physicians.

- Caretakers were interviewed by the surveyor-2 after they had received drugs from the pharmaceutical section of the health facilities. This was so as to understand the treatment advised by the health care workers and pharmacists.

Inclusion criteria:

All children under five years of age with cough and/or difficulty breathing who sought care at health facilities during the survey period.

Exclusion criterias:

1. Children with or without cough/difficulty breathing who also had ear problems.

2. Children with or without cough/difficulty breathing who were diagnosed with asthma by surveyors or health workers.

Results

Quality of Health Facilities

1. Health Facilities

The 77 health facilities surveyed consisted of 29 district hospitals (37.7%) and 48 health centers (62.3%). Each survey team of 2 surveyors was able to survey 1 health facility per day.

There were 563 ARI cases enrolled in this survey. In most of them (98.9% or 557 cases) the patients were over 2 months of age. In only 6 cases (1.1%) were they under 2 months of age. More than half of all the children enrolled (64.7%) were found at health centers.

The 130 health workers interviewed in the survey consisted of 40 doctors (30.8%), 2 nurses (1.5%), 23 technical nurses (17.7%), 36 midwifes (27.7%), and 29 junior sanitarians (22.3%).

The proportion of staff treating ARI who had been trained in both health centers and in district hospitals was 51.6%.

2. Availability of recommended drugs

The pharmacies of the hospitals and health centers were checked. The drugs which were available at the time of survey and had not been out of stock in the last 12 months included Amoxycillin (96.1%), Cotrimoxazole (89.6%), oral penicillin (98.7%), paracetamol (96.1%), salbutalmol or terbutaline (74%), and recommended cough syrup (glyceryl guaiacolate or ammonium carbonate) (77.9%). None of the district hospitals were short in recommended antibiotics for treatment of non-severe pneumonia (amoxycillin or cotrimoxazole). In some health centers (3.9%) amoxycillin was not available, but most of these health centers also had cotrimoxazole as an alternative drug for treatment of non-severe pneumonia.

3. Health facilities' ability to give ARI standard case management

All of the 29 district hospitals in this survey were able to provide standard case management. They had at least 1 staff member trained, and recommended antibiotics had not been out of stock in the last 12 months. Almost 100% of the health centers (47 out of 48 or 98.7%) were able to give standard case management.

4. ARI training/health education materials

ARI training/health education materials in the health facilities (written guidelines, ARI charts, and home care cards) were checked. The results revealed that 90.9% had written standard case managment guidelines, 89.6% had ARI charts displayed, and 81.8% had home care cards. The availability of these 3 training/education materials was higher in health centers than in district hospitals.

5. ARI recording system

Only 1 out of 48 health centers did not have a logbook while all of the district hospitals had logbooks for recording information of health services provided.

Quality of Health Workers

1. Classification of ARI cases

Agreement on classification between the surveyors and the health workers among all ARI cases (no pneumonia, non-severe pneumonia, severe pneumonia, and very severe disease) was 80.5%. When defining non-severe pneumonia, severe pneumonia, and VSD cases as a single classification (= "Antibiotic-required cases" or "all pneumonia cases"), health workers gave correct classifications in 24.6% cases and gave under and over-classification in 75.4% for this group as shown in table 1 below. In addition, for no pneumonia cases, health workers gave over-classification in 3.6%, as shown in table 1 below.

Table 1. Agreement on classification of illness between surveyor and health worker.

Health worker's classification	surveyors's classification				Total
	VSD	SP	P	No.P.	
VSD	0 (a)	1 (b)	0 (c)	1 (d)	2
SP	0 (e)	0 (f)	0 (g)	0 (h)	0
P.	2 (i)	0 (j)	14 (k)	17 (l)	33
*No P.	3 (m)	5 (n)	37 (o)	439 (p)	484
Other	2 (q)	0 (r)	5 (s)	37 (t)	44
Total	**7**	**6**	**56**	**494**	**563**

Remarks: (from table 1)

- VSD = very severe disease   SP   = severe pneumonia

  P   = pneumonia   No P = no pneumonia

- Healh workers classified disease correctly among all pnemonia cases

$$= \frac{a+b+c+e+f+g+i+j+k}{a+b+c+e+f+g+i+j+k+m+n+o+q+r+s} \times 100$$

$$= \frac{17}{69} \times 100 \qquad = 24.6\%$$

- Health workers classified disease incorrectly (over clasified) among no pneumonia cases

$$= \frac{d+h+l}{d+h+l+p+t} \times 100$$

$$= \frac{18 \times 100}{494} = 3.6\%$$

Reasons for providing under-diagnosis among 52 out of 69 antibiotic-required cases by health workers were as follows:

- not counting respiratory rate (51.9%),

- incorrect respiratory rate counting (25%),

- not looking for an indrawn chest (25.5%),

- not assessing other signs of danger (25.5%).

- counted RR (and fullfilled criteria for diagnosis as pneumonia) but did not use the results for classification (25%).

2. Treatment of ARI cases

Health workers gave appropriate treatment to 57.9% of the antibiotic-required cases (including non-severe pneumonia, severe pneumonia, and VSD cases) with antibiotics at home or admission. Sixty-six percent of the non-pneumonia cases were correctly not given antibiotics. In other words, overtreatment of non-pneumonia cases by giving antibiotics was 34%. Undertreatment of antibiotic-required cases by giving home care was 42%, as shown in table 2. The reasons for under-treatment of P+SP+VSD cases was the same as the reasons for the under-classification described above.

3. Agreement in both classification and treatment

Among the 69 antibiotic-required cases (non-severe pneumonia, SP, and VSD) diagnosed by the surveyors, 15 cases (21.7%) were correct in both classification and treatment (with and without advice) by the health workers while only 4 cases (5.8%) were given both incorrect classification and incorrect treatment.

4. Health workers assessment

Most of the ARI patients had their temperatures measured (80.1%), were asked about their ability to drink (67.7% and 83.3% for children over and under 2 months of age, respectively), were assessed for stridor (66.7 and 72.4% for children over and under 2 months of age, respectively), but the proportion of children assessed for important signs was unsatisfactory (66.9% for indrawn chests and 58.6% for respiratory rate). Among the 58.6% of the ARI children that were assessed for respiratory rate by the health workers, agreement on assessment of fast breathing (by WHO criteria) between the health workers and the surveyors was 77.5%. Among the 46 cases that were assessed by the surveyors as having fast breathing, only 25 cases (54%) were similarly assessed by the health workers.

Among the 66.9% of the ARI children assessed with indrawn chests by the health workers, the agreement on assessment with the surveyors was 96.3%. Even though all of the cases (100%) assessed by the surveyors as having indrawn chests were similarly by assessed health worker, the number was too small to determine if the quality of the health workers on assessment of chest indrawing was satisfactory.

Table 2.   Relation of surveyor's and health worker's treatment.

Health worker's Treatment	Surveyor's Diagnosis and treatment			
	VSD, SP/Refer, admit	P/AB	No P./Home care	Total
Home care	4 (a)	15 (b)	232 (c)	251
Home care*	0 (d)	10 (e)	94 (fo	104
AB	6 (g)	25 (h)	157 (i)	188
AB*	0 (j)	4 (k)	11 (l)	15
Refer/admit	3 (m)	2 (n)	0 (o)	5
Total	13	56	494	563

Remarks :   (from table 2)

- Home care   = No antibiotic + no advice

- Home care*   = No antibiotic + correct home care advice

- AB   = Antibiotic at home + no explanation about dosage

- AB*   = Antibiotic at home + explanation about dosage

- Health workers gave appropriate treatment among all pneumonia cases $= \dfrac{g+h+j+k+m+n}{a+b+d+e+g+h+j+k+m+n} \times 100$

$$= \dfrac{40 \times 100}{69} = 57.9\%$$

- Health workers gave treament correctly to no pneumonia cases $= \dfrac{c+f}{c+f+i+l+o} \times 100$

$$= \dfrac{326 \times 100}{494} = 65.9\%$$

5. *Health worker's knowledge on ARIC Standard case management* (by interviewing)

Among the 132 health workers interviewed for knowledge about ARI standard case management, 90 (68.2%) had already been trained in ARI standard case management and the remaining 42 (31.8%) had not been trained. There were 10 questions regarding assessment, classification, and treatment on SCM, and each question had 1 point for a total possible score of 10.

The results of comparing mean scores between trained and untrained health workers on assessment, classification, treatment, and total score revealed that only the assessment scores of the trained personnel was significant higher than for the untrained personnel.

Comparing the proportion of scores of more than five between the trained and untrained health workers revealed no significant difference. But when comparing after stratification by type of health worker (doctors and paramedical officers) a significant difference appeared only among the paramedical officers.

6. Communication with mothers

Among patients given antibiotics, 67.8% of the health workers provided antibiotic use instruction to the mothers but most of them (60.4%) gave incomplete instruction. In other words, only 7.4% gave complete instruction (correct type of antibiotic and correct dosage and correct duration and instruct then to return within 2 days).

Among the cases diagnosed as no-pneumonia by the surveyors, 68.2% of the health workers provided at least 1 danger sign or home care instructions to the caretakers, but only 24.3% of these gave both danger signs and home care instructions.

7. Review of health facility logbook

A total of 1,540 ARI cases (20 cases per health facility) were isolated from 4,867 children under five years of age who sought help from health services, and this was a 31.6% rate. Pneu-monia cases diagnosed and treated at the health facilities accounted for 7.7% of the total ARI cases. The workload of ARI cases at the district hospitals was 2.27 cases/day, and at the health centers was 0.79 cases/day. Ninty-five percent of the pneumonia cases diagnosed by the health workers received appropriate antibiotics. Thirty-nine percent of the no-pneumonia cases received unnecessary antibiotics, which was quite similar to the number calculated from observation of the health workers' practice by the surveyors.

Discussion

The number of health facilities enrolled in our study was 77 and this is a large enough number to identify problems in the quality of case management prabably existing at other health facilities not enrolled in our study and can help guide future efforts of the ARI program to correct the problems (the smallest number of health facilities enrolled, as recommended by WHO, was 30). Moreover, the 69 antibiotic-required cases (non-severe pneumonia, severe pneumonia, and VSD) was large enough to generalize the results of the survey as to the population of under five children (the smallest number of antibiotic-required cases recommended was 60).

The percentage of staff who had been trained in ARI standard case management in the district hospitals (48.7%) was lower than in the health centers (58.9%) This is likely due to the rapid turn over of staff at the district hospital level. The overall percentage of trained staff

(51.6%) was satisfactory, but needs to be increased and maintained by training for new staff.

The availability of recommended drugs in most of the health care facilities was satisfactory, except for low levels (77.1%) of recommended cough syrups in health centers. To overcome this problem, pharmacists who are members of ARI Provincial Committees and pharmacists of district hospitals (which are drug storage facilities for health centers) need to play a major role for drug purchasing and supply.

The percentage of health care facilities able to give ARI standard case management was satisfactorily high (98.7%). Only 1 health center in this survey had no trained staff.

The availability of ARI written guidelines, ARI charts, and home care cards were high at 90.9%, 89.6%, and 81.8% respectively. All 29 district hospitals had logbooks for the recording of ARI services, while only 1 out of 48 of health centers had no logbook (availabilty at health centers was 98.7%).

The underdiagnosis by health workers is of much concern because when an underdiagnosis has been made in antibiotic-required cases (non-severe pneumonia, severe pneumonia, and VSD), it will result in undertreatment of those cases and can result serious complications or even death. In this survey, correct diagnosis had been made by health workers in 80.5% of all ARI cases. Moreover, among antibiotic-required cases, the correct diagnosis by health workers was only 24.6%,

which is lower than in 1993 (42%). Among the 69 antibiotic-required cases, the appropriate treatment was given to only 57.9% of the cases which was below the 80% target. In addition, among these 69 cases, the rate of both correct diagnosis and correct treatment by health workers was only 21.7% (15 cases) which was unsatisfactorily low. Another important weakness in the quality of case management by health workers was insufficient and inefficient communication to caretakers in both groups of patients who received antibiotics and those who did not. One explanation for this was low numbers of staff trained in standard case management at the time of the survey (52%).

The results of reviewing ARI case log-books demonstrated that lack of time was not the most important problem for the health workers. Instead, not counting their respiratory rates and not looking for indrawn chests, for which they did not recognize the benefit, was more important.

From the results of this survey, we can conclude that the quality of ARI case management by health workers is not currently satisfactory, particularly in the assessment of ARI cases and communication to caretakers. The contributing factors for this dissatisfactory result were not from the following:

- The unavailability of drugs (except recommended cough syrup in some health centers).

- The unavailability of training materials.

- The unavailability of ARI trained staff.

The identified contributing factors were:

- They do not recognize the benefits of ARI standard case management (even in the trained staffs).

- Lack of time?

Recommendations from this survey

1) The quality of most of the health facilities is satisfactory and must be maintained.

2) The quality of the health workers needs to be improved through close supervision and intensive training focusing on assessment, particularly on the importance of counting respiratory rates, looking for indrawn chests and communication to caretakers). In addition, expansion of staff training might be one of the better solutions.

Not only health workers but also all levels of responsible agencies in the ARIC program (central, regional, provincial and local), should use these results as an assessment of the whole program for further improvement.

3) Recommended cough syrup, even though increased over the previous survey, regularly needs to be supplied to every health center. Pharmacists of district hospitals and of Provincial ARI Committees will play an important role here.

4) To cope with the problem of shortages of trained doctors, particularly in district hospitals, the integration of ARIC standard case management into medical school curriculum might be very halpful.

5) There should be adjustment of the program's targets in accordance with the actual situation. For example, reduce target levels of correct management of children with pneumonia.

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