

Impact of National Protocol on management of Acute Respiratory Infections in children

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ABSTRACT

Objective: To measure the impact of implementation of the national protocol on the prescribing patterns for acute respiratory infections among children attending a large primary health care center in Abha City.

Method: This study was carried out during December of 1997 and February of 1998 in Abha City, Asir Region, Kingdom of Saudi Arabia. One quarter of the prescriptions which were issued in those 2 months were selected randomly and assessed for age, sex, diagnosis and the prescribed drugs before and after intensive training of the primary health care physicians on the implementation of the national protocol for acute respiratory infections.

Results: One hundred and forty five and 123 prescriptions

were selected and assessed pre and post the implementation of this protocol. Our findings showed a decrease in the prescription of antibiotics from 53% to 33%, anti-cough drugs from 43.5% to 6%, and anti-histaminics from 20% to 10%.

Conclusion: Training on the national protocol and its implementation will decrease the rate of prescribing and misuse of unnecessary drugs such as antibiotics, anti-cough and anti-histamines.

Keywords: Impact, national protocol, acute respiratory infections.

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Acute respiratory infection (ARI) is a common health problem in Saudi Arabia. It was found in many studies and reports from different regions in Saudi Arabia that this problem was the main reason for visiting primary health care centers (PHCCs).¹⁻⁵ Many researchers found that this health problem was responsible for the over-prescribing of antibiotics and other drugs which did not prove to be cost-effective.⁶⁻¹¹ In order to reduce mortality, morbidity, misuse of antibiotics and diagnostic procedures the General Directorate of Primary Health Care at the Ministry of Health in Saudi Arabia issued the National Protocol for Diagnosis and Treatment of Acute Respiratory Infections (NPARI) among Children in 1997.⁷ In one country such as Pakistan, it was found that using the standard protocol for management of ARI tended to decrease the rates of

mortality, morbidity, and prescribing unnecessary drugs.¹² To our current knowledge, there was no national study carried out to measure the impact of this protocol on the diagnosis and treatment of ARI in Saudi Arabia. The objective of this study is to measure the impact of the implementation of the national protocol on the patterns of prescribing for ARIs among children in one of the largest PHCCs in Abha City, Asir Region, Kingdom of Saudi Arabia.

Methods. This study was carried out during December 1997 and February 1998 at Wasat Abha Primary Health Care Center (WAPHCC) which is one of the largest 6 PHCCs in Abha city, the capital of Asir Region, Saudi Arabia. Five general practitioners, one family physician, 10 nurses, a

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radiology technician, 2 pharmacists, a lab technician, a health inspector, and one administrator staff this PHCC. It serves approximately 15,000 inhabitants, 20% of which are under 5 years old.¹³ At the end of 1997, the health team discussed the action plan of WAPHCC. One of the health problems that was discussed by the health team was ARIs. Acute respiratory infection was considered as a health problem among the children for the following reasons: 60% of the children presented to WAPHCC with ARI,¹³ most of these cases did not need antibiotics prescribed, however, parents of those children insisted on prescribing antibiotics and cough syrups in spite of the clinical diagnosis. During the last week of January 1998, the family physician and the technical director who had previously attended an intensive course on the implementation of the national protocol of ARIs conducted daily group discussion sessions for the health team at WAPHCC. At the end of that week, the PHCC team agreed upon implementation of the protocol, conducting face to face health education during consultation and distribution of health education pamphlets on ARIs. To measure the impact of these interventions, one 4th of total prescriptions which were issued one month before and one month after these interventions (December of 1997 and February of 1998) were selected randomly by using the table randomization method. The inclusion criteria for this study was: children under 5 years, who live in the catchment areas and have medical records at WAPHCC, and have the clinical diagnosis of ARI. The essential structures for the ARI program were assessed by a checklist which was developed and used by Al-Khaldi et al in a previous study.¹¹ The checklist of the essentials items of ARI was scored on a 3 point scale: 2 (if the item was available all time), 1 (if the item was available sometime), and 0 (if the item was not available at all). The total score of each structure is 16 points. The structures constitute as adequate if the total score was ≥ 12 points and inadequate if it was less than 12 points (Table 1). Data of the selected prescriptions was entered into and analyzed by the SPSS statistical package program. Chi-square test was used to find out the differences between the categorical data. The significant test was considered significant if P value was less than 0.05.

Results. A total of 268 prescriptions were randomly selected, 145 of them were selected before and 123 of them were selected after the implementation of the NPARI. Table 2 displays the characteristics of the target children of this study. All the studied characteristics were similar except the age group ($P < 0.05$). The patterns of the ARIs according to clinical diagnosis are shown in Table 3. Common cold was the most common morbidity. The impact of the NPARI on the patterns of prescribing is summarized in Table 4. Generally, the rates of

Table 1 - Availability of essential structures for optimal ARI care at WAPHCC before and after implementation of protocol.

| Items | Scale* | | |
|--------------------------------------------------------------------|---------------------|---|----------------------|
| | 0 | 1 | 2 |
| | Pre-protocol | | Post-protocol |
| 1. Primary health care physicians attended training course in ARI. | 0 | | 2 |
| 2. Availability of essential drugs: | | | |
| a - Penicillin - V/Amoxicillin. | 2 | | 2 |
| b - Erythromycin/co-trimazole | 2 | | 2 |
| c - Normal saline nasal drop | 0 | | 1 |
| 3. Availability of health education material (Posters, pamphlets). | 0 | | 2 |
| 4. Number of physicians proportionate to the population size. | 2 | | 2 |
| 5. Availability of protocol for ARI management. | 0 | | 2 |
| 6. Presence auditing system for ARI. | 0 | | 0 |
| Total | 6 | | 13 |

ARI - Acute respiratory infection
WAPHCC - Wasat Abha Primary Health Care Center
*Scale: 0 = not available at all; 1 = available most of the time
2 = available all the time

Table 2 - Profile of children presented with ARIs at WAPHCC.

| Characteristics | Pre-protocol N = 145 (%) | Post-protocol N = 123 (%) | P-value |
|-----------------|-----------------------------|------------------------------|---------|
| Age | | | |
| <1 year | 33 (23) | 47 (38) | 0.004 |
| <5> 1 year | 112 (77) | 76 (62) | |
| Sex | | | |
| Male | 76 (52) | 76 (62) | 0.07 |
| Female | 69 (48) | 47 (38) | |
| Nationality | | | |
| Saudi | 136 (94) | 109 (89) | 0.2 |
| Non-saudi | 9 (6) | 14 (11) | |

ARI - Acute respiratory infection
WAPHCC - Wasat Abha Primary Health Care Center

Table 3 - Patterns of ARI before and after implementation of NPARI.

| Diagnosis | *Pre N = 145 (%) | **Post N = 123 (%) |
|-------------------------|------------------|--------------------|
| Common Cold | 56 (39) | 58 (47) |
| Tonsillitis/Pharyngitis | 15 (10) | 18 (15) |
| Bronchitis | 14 (10) | 2 (2) |
| Otitis meda | 0 (0) | 14 (11) |
| Non-specific URTI | 60 (41) | 28 (23) |

ARI - Acute respiratory infection; NPARI - National Protocol of Acute Respiratory Infections. *Pre - Before implementation of NPARI
**Post - After implementation of NPARI;
URTI - Upper respiratory tract infection

Table 4 - Pattern of prescribed drugs before and after implementation of NPARI.

| | *Pre-protocol N = 145 (%) | **Post-protocol N = 123 (%) | P-value |
|----------------|------------------------------|--------------------------------|---------|
| Antibiotics | 77 (53) | 41 (33) | 0.01 |
| Cough Syrup | 63 (43.5) | 7 (6) | 0.00 |
| Antihistamines | 29 (20) | 12 (10) | 0.02 |
| Normal Saline | 0 (0) | 6 (5) | 0.01 |

NPARI - National Protocol of Acute Respiratory Infections.
*Pre - Before implementation of NPARI
**Post - After implementation of NPARI;

prescribing of all drugs decreased significantly after the implementation of the NPARI ($P < 0.05$).

Discussion. Introducing good health care services at PHCCs depends on many pillars. The most important one is the provision of infrastructure items such as essential drugs and clinical protocols.¹⁴ In a large country such as Saudi Arabia, it was found that PHCC physicians come from different countries, graduated from various medical schools and they have their own approach to management of ARI.⁶ As a result, the Directorate General of Primary Health Care in the Ministry of Health (MOH) established the NPARI to unite the clinical approach in order to manage this common health problem in a cost-effective manner.⁷

Before implementation of any protocol, it is essential that the health team should be trained on such a protocol and the essential items of the infrastructure should be provided. To overcome this problem, the health team was trained, the action plan for our practice was discussed, the pharmacy was provided the essential drugs, and a copy of NPARI manual was distributed to all physicians at our PHCC.

All these interventions were predicted to illicit positive changes on the patterns of diagnosis and prescribing. The rates of diagnosis of common cold, tonsillitis and otitis media increased, on the other hand the diagnosis of bronchitis and non-specific upper respiratory infections (URTI) decreased. These positive changes could be due to the impact of the NPARI on the knowledge and attitude of PHC physicians regarding the clinical approach which, was simply illustrated in the NPARI manual⁷ and due to the intensive group discussion sessions which were conducted for one week in our practice. These findings revealed the importance of continuing medical education, which has been recommended by many studies from Saudi Arabia.¹⁵⁻¹⁸ The implementation of the NPARI showed another positive impact on the patterns of prescribing for ARI

in our practice. Although, there was an increase in the diagnosis of the conditions which require the use of antibiotics such as tonsillitis and otitis media, the rate of prescribing antibiotics decreased from 53% to 33%. Furthermore, the prescribing of cough syrups and anti-histamines decreased dramatically. These findings agreed with those reported by Qazi and Khan in Pakistan¹² and another conducted study from the United Kingdom.¹⁹ In spite of the practicality and simple approach of the NPARI, it is difficult to attribute these dramatic changes to its implementation only. Daily health education of the community through distribution of the pamphlets by the receptionists and face to face health education during consultations could attribute significantly to these positive changes also.

In conclusion, this pilot study showed that the practical implementation of the NPARI improved the clinical diagnosis and decreased the irrational prescribing of drugs especially antibiotics. Health education of the community is necessary to support this success. A countrywide study on the impact of the training of this protocol on the knowledge and attitudes of physicians and community is suggested.

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