

Primary Care Physicians' Knowledge and Attitude towards Prescribing Medication for Acute Respiratory Infection

Khalid S Al Gelban, MD, SSCFM* Yahia M Al Khaldi, MD, CABFM** Mohammed M Diab, MD, MRCGP* Ali S Al Asmari, MD** Salah Eldeen M Elamin, MD**

Objective: This study was performed to assess primary care physicians' knowledge and attitude towards prescribing medications for acute respiratory infections (ARIs).

Setting: Aseer Region Primary Care Physicians.

Design: Cross sectional study.

Method: A cross sectional study using a self-administered, questionnaire carried out during March and April 2004, among all primary care physicians.

Result: Out of 320, 268 questionnaires were returned (response rate=83.75%). The mean rank of score in knowledge on ARIs was 16 (SD = 2.0) out of 21. More than 80% of respondents have heard about the National Protocol for ARIs (NP-ARIS). One-third has attended a training course on the protocol, while a third did not want to attend such type of training. Of the 153 physicians who had copies of the protocol, 145 read it. However, only 85 physicians of those who read it comply with it. Physicians with experience more than 5 years in primary health care centres attended more training courses on the NP-ARIs (44% vs 20%, $p = 0.01$), had a positive attitude towards it (70% vs 60%, $p = 0.04$). Those who were trained on the protocol, prescribed anti histamines and vitamin c less frequently (38% vs 60%, $p = 0.04$) and (38% vs 61%, $p = 0.04$) respectively.

Conclusion: Over-prescribing for acute respiratory infections is a common behaviour among primary care physicians, despite their good knowledge of the health problem.

Bahrain Med Bull 2009; 31(1):

Acute respiratory infection (ARIs) is defined as an infection of upper, or lower respiratory tract for less than 30 days duration¹. It is the most common group of illnesses for which children, and adults seek medical attention^{2,3}.

Worldwide, ARI is responsible for four-million deaths annually, and 50% morbidity rate among children⁴. Research consistently, indicates that viruses are the prominent cause⁵. Based on that, evidence-based guidelines point to the self-limiting nature of the majority of these conditions⁶. However, more guidelines are written than implemented⁷.

* Department of Family and Community Medicine
College of Medicine, King Khalid University

** Department of Family and Community Medicine
Aseer General Directorate of Health affairs
Kingdom of Saudi Arabia

Globally, medications are frequently over-prescribed to ARIs patients⁸. In 2006, a study in the United States showed that antibiotics were prescribed for 65% of ARIs episodes which is the same percentage in 2000⁹. In Saudi Arabia, some aspects of management for this health problem have been tackled¹⁰⁻¹¹. Al-khaldi et al reported that prescriptions for ARIs patients were antipyretics 78%, antihistamines 48%, antibiotics 45% and anti-tussive 25% of the episodes³. If these unnecessary prescriptions can be curtailed, individuals as well as the whole community will benefit¹². To promote good practice in management of ARIs, the Saudi ministry of health issued the National Protocol for Acute Respiratory Infections - (NP-ARIs) in 1999¹³. However, national studies show that ARIs patients receive a significant proportion of medications prescribed each year^{3,10-11}. One possible reason for that is the physicians' knowledge on this health problem, or their attitude towards the NP-ARIs. Research shows that doctors' opinions are the strongest determinants of prescribing^{6,14}.

The aim of this study is to assess primary care physicians' knowledge and attitudes towards prescribing medications for ARIs.

METHOD

A cross sectional study using a self-administered, questionnaire carried out during March and April 2004, among all Aseer Region primary care physicians (PCPs). The questionnaire had four parts. The first part is personal and professional data. The second part contains 21 true/false statements to assess the participants' knowledge on ARIs. The third part consists of seven yes/no questions to address the primary care physicians' attitudes towards ARIs. The last part was designed to address the physicians prescribing behavior through nine yes/no questions. All health technical supervisors of the sixteen health sectors have been trained on the questionnaire. Three hundred and twenty copies of the questionnaire were distributed, filled and returned to the researchers under close supervision of the supervisors. Data were entered and analyzed using a personal computer. Statistical Package for Social Sciences (SPSS) software version 12 was employed. Appropriate tests were used accordingly, and p-value was considered a significant if it is less than 0.05.

RESULT

A total of 268 PCPs were enrolled in this study, giving a response rate of 83.75%.

Table 1, shows the personal and professional characteristics of the study population. Their mean age was 41 (SD= 5.8) years with 6:1 male to female ratio. The physicians of Arab nationalities formed around three quarters of the respondents. The physicians' experience since their graduation from medical school were 16 (SD=6.2 years), and they have been in general practice for nine (SD=6.2) years. Most physicians (84%) have MBBS qualification only.

Table 1: Personal and Professional Characteristics of Primary Care Physicians (N= 268)

Characteristics	No (%)
Age	41 (SD* = 5.8)
Sex:	

Male	227 (84.7%)
Female	41 (15.3%)
Total	268 (100)
Nationality:	
Arabs	191 (71.3%)
Non-Arabs	77 (28.7%)
Total	268 (100)
Duration since graduation from medical school	16(SD = 6.8) years
Experience in primary health care centers	9 (SD= 6.2) years
Qualification:	
MBBS only	225 (84%)
Diploma	24 (9%)
Master	15 (6%)
Board Certified	1 (0.4%)
Not Stated	3 (1.4%)
Total	268 (100)

*SD= Standard deviation.

Table 2, displays the participants' knowledge on ARIs. The mean rank of score was 16 (SD = 2.0) out of 21. All physicians exceeded the passing mark (60%) except in the item stated "normal saline nasal drop is adequate remedy in treatment of runny nose" which was answered correctly by 58% of the respondents.

Table 2: Primary Care Physicians' Knowledge of Acute Respiratory Infections (N=268)

Answer	Statement	Response =268		
		Correct	Incorrect	DK*
Correct Statement	Most children suffering from common cold are below 5 years	214 (79.9)	46 (17.2)	8 (3.0)
	Normal saline nasal drop is adequate in treating of runny nose	155 (57.8)	102 (38.1)	11 (4.1)
	Viral agents are usually the cause of sore throat	198 (73.9)	69 (25.7)	1 (0.4)
	White exudates indicate streptococcal pharyngitis	194 (72.4)	69 (25.7)	5 (1.9)
	Pneumonia in infants below two months old is serious	211 (78.7)	53 (19.8)	4 (1.5)
	Mothers should be educated about the serious signs of ARIs	237 (88.4)	31 (11.6)	0
	The drug of choice for otitis media is amoxicillin	218 (81.4)	47 (17.5)	3 (1.1)
	Vaccination of children could reduce the incidence of ARIs	170 (63.4)	93 (34.7)	5 (1.9)
	Bronchiolitis affect infants more frequent than older children	212 (79.0)	45 (17.0)	11 (4.0)
	Personal hygiene is essential in prevention of ARIs	229 (85.4)	35 (13.1)	4 (1.5)
Incorrect Statement	Most of children with URTI* develop LRT*	41 (15.3)	226 (84.3)	1 (0.4)
	Stridor is an expiratory sound	33 (12.3)	230 (85.8)	5 (1.9)
	Fever is a rare presentation of LRTI*	30 (11.2)	231 (86.2)	7 (2.6)
	Strider is a common finding in LRTI*	52 (19.4)	208 (77.6)	8 (3.0)
	Bacterial agents are usually the cause of bronchiolitis	43 (16.0)	220 (82.1)	5 (1.9)
	Otitis media is mostly caused by viral agents	48 (17.9)	218 (81.3)	2 (0.8)
	Breast-feeding. is contra indicated in the presence of vomiting	37 (13.8)	229 (85.4)	2 (0.8)
	Acute otitis media can be treated with eardrops	69 (25.7)	195 (72.8)	4 (1.5)
	Antibiotics reduce the duration of symptoms of sore throat	84 (31.3)	179 (66.8)	5 (1.9)
	Wheezing is exclusively found in bronchial asthma	75 (28.0)	192 (71.6)	1 (0.4)
Cotrimoxazole is safe in infants below two months	43 (16.1)	222 (82.8)	3 (1.1)	

*DK: Do not Know, URTI: Upper respiratory tract infections; LRTI: Lower respiratory tract infections

Table 3, describes the physicians' attitude towards the NP-ARIs. More than 80% of them have heard about it, one third have attended a training course while a third did not want to attend such type of training. Of the 153 physicians who had copies of the protocol, 145 read it. However, only 85 physicians of those who read it comply with it. Physicians with

experience of more than 5 years in PHCCs and attended more training courses (44% vs 20%, $p = 0.01$) had a better compliance with the protocol (70% vs 60%, $p = 0.04$).

Table 3: Primary Care Physicians' Attitudes towards the National Protocol for Acute Respiratory Infections (NP-ARIs) (N= 268)

Question	Response		Total
	Yes	No	
Did you hear about NP-ARIs?	223 (83%)	45 (17%)	
Did you attend a training course on NP-ARIs?	89 (33%)	179 (67%)	
Do you want to attend a training course on NP-ARIs?	183 (68.5)	84 (31.5)	268 (100%)
Do you have a copy of NP-ARI?	153 (57%)	114 (43%)	
If you have a copy, did you read it?	145 (94.8%)	8 (5.2%)	153 (57.5%)
If you read it, do you comply with NP-ARI?	85 (59%)	60 (41%)	
Did you face any difficulty in reading NP-ARIs?	32 (22%)	113 (77.9)	145 (54.1)

Table 4, illustrates the respondents believe in medications prescribing for ARIs. Those with experience less than 5 years in PHCCs believe that using antibiotics reduces ARIs complications (28% vs 21%, $p = 0.01$) and, using vitamin-c reduces severity of the infection in children (70% vs 63%, $p = 0.03$). Those who were trained on the protocol, prescribe anti histamines and vitamin c less frequently (38% vs 60%, $p = 0.04$) and (38% vs 61%, $p = 0.04$) respectively.

Table 4: Primary Care Physicians' Belief in Prescribing for Acute Respiratory Infections (N=268)

Statement	Response (%)		
	Yes	No	DK*
Antibiotics cure most cases of ARIs among children	61 (22.8)	168 (62)	39 (14.5)
Antibiotics reduce complications viral of ARIs	60 (22.4)	172 (64.2)	36 (13.4)
Antibiotics are necessary in treating otitis media	237 (88.4)	19 (7.1)	12 (4.5)
Vitamin c reduces the severity of common cold	163 (60.8)	85 (31.7)	20 (7.5)
Anti-histamines reduces the severity of common cold	197 (73.5)	59 (22)	12(4.5)
Salbutamol relieves symptoms of acute bronchitis	172 (64.2)	77 (28.7)	19 (7.1)
Implementation of NP-ARI reduces the prescription of antibiotics	252 (94)	11 (4.1)	5 (1.9)
NP-ARI increases public awareness about ARIs nature	238 (88.8)	18 (6.7)	12 (4.5)
Eardrops have an important role in management of otitis media	50 (18.7)	179 (66.8)	39 (14.5)

*DK: Do not know

DISCUSSION

The findings in this study indicate that primary care physicians in Aseer Region have a good knowledge on ARIs. However, their attitude towards the NP-ARIS and their prescribing habits are not coherent with evidence-base guidelines.

These findings are in agreement with previous national, regional and international studies^{3,12,16-19}.

Unlike the majority of previous studies, all primary care physicians in the region were included in this research. This has the advantage that sampling error could be minimized. However, there are some limitations in this study; it relied on self-reporting and it is not known how accurate the information is. Besides this, physicians' or other professionals' reports of their behaviour may not correspond to their actual behaviour as they might have the tendency to give desirable answers.

Physicians' characteristics had no relation to their knowledge, attitude, or prescribing habits. All physicians had at least minimum score in knowledge about ARIs, which might be related to the common presentations of such problem. However, they scored low in the following statement "normal saline nasal drop is adequate in treatment of runny nose" which might indicate that they are disease rather than patient-oriented in their daily practice.

Although more than three-quarters of the participants have copies of the NP-ARIs, and they can read it without difficulties. However, less than half of them comply with it, this indicates that more guidelines are written than are implemented¹². Physicians with more experience in PHCCs were more compliant with the protocol. It appears that these physicians had the privilege of being trained with the protocol, and would therefore, be more likely to have been familiar with it. One-third of the population did not want to be trained with this protocol. This can be explained by their lack of awareness about the protocol, and its importance, or they might disagree with it as they came from different countries and graduate from different schools that may follow different guidelines.

This study showed that physicians have the tendency to prescribe antibiotics for ARIs despite it is well known that over-prescribing of antibiotics is the primary factor causing resistance. This finding is similar to other international and national studies^{3,6,12,16-19}. In Belgium, more than 50% of patients in primary health care setting complaining of sore throat receive antibiotics⁶. In USA, Gonzales et al reported that office visit for ARIs accounting for 21% of all antibiotics prescriptions to adults²⁰. Nash DR et al reported that almost half of the patients with upper respiratory tract infections receive antibiotics²¹. The reason for unnecessary and excessive prescription of antibiotics are complex, but it may include pressures from patients, parents, and constraints on physician time, plus a lack of appreciation of possible impact on resistance²²⁻²³. In this study, physicians reported that they prescribe medications for ARIs in the following frequencies: antibiotics (19%), vitamin c (20%), Anti-histamine (44%) and anti-cough (34%). Antihistamines is the second order on the prescription list, this implies that a big amount of costly drugs were prescribed which have no proven benefits, or even harmful for self-limiting illness²⁴. PCPs of fewer years experience in PHCCs believe that using antibiotics reduce ARIs complications, and vitamin c reduces severity of ARIs in children. This can be attributed to patients' pressure, lack of training and continuing medical education program¹⁹.

There have been many forms of interventions aimed at changing physicians' prescribing behaviour^{12,25}. The majority have shown positive effects including savings, use of fewer and cheaper prescriptions, but sometimes old habits supersede, which suggests the need for repeating the intervention at frequent intervals²⁵.

CONCLUSION

Primary care physicians in Aseer Region have a good knowledge of ARIs. However, their attitude towards the NP-ARIs and prescribing habits for this health problem are not matching the best available evidence. Health authorities should develop policies to support judicious use and evaluate whether existing policies may unintentionally promote over-prescription.

REFERENCES

1. Benenson AS. Control of Communicable Diseases Manual. An Official Report of the American Public Health Association, 16th ed. Washington DC, American Public Health Association 1995; 395-400.
2. World Health Organization (WHO). The Management of Acute Respiratory Infections in Children: Practical Guidelines for Outpatient Care: WHO, 1995.
3. Al-Khaldi YM, Diab MAA, Al-Gelban KS, et al. Prescribing Patterns for Acute Respiratory Infections in Primary Health Care, Aseer Region, Saudi Arabia .Journal of Family & Community Medicine 2005; 12: 121-5.
4. Cattano A. Current Role of Vaccination in Preventing Acute Respiratory Infections in Children in Developing Countries. Monaldi Archives for Chest Disease 1994; 49: 57-60.
5. Arroll B, Kenealy T. Antibiotics for the Common Cold and Acute Purulent Rhinitis Cochrane Database Syst Rev 2005; 20(3): CD000247.
6. Dreil ML, Sutter AD, Devugele M, et al. Is Sore Throat Patients Who Hope for Antibiotics? Actually, Asking for Pain Relieved. Ann Fam Med 2007; 4: 494-99.
7. Grismshaw J, RussseIT. Effect of Clinical Guidelines on Medical Practice: a Systematic Review of Rigours Evaluation. Lancet 1993; 342: 1317-22.
8. Grol R, Halhuijsen J, Thomas S, et al. Attributes of Clinical Guidelines in General Practice Observation Study. BMJ 1998; 317: 858-61.
9. Hickner J.A. New Look at an Old Problem: Inappropriate Antibiotics for Acute Respiratory Infections. Ann Fam 2006; 4: 484-5.
10. Bawazir S. Prescribing Patterns of Ambulatory Care Physicians in Saudi Arabia. Ann Saudi Med 1993; 13: 172-7.
11. Al Faris EA, Al Taweel AA. Audit of Prescribing Patterns in Saudi Arabia Primary Health Care: What Lessons Can be Learned. Ann of Saudi Med 1999; 14: 317-21.
12. Khoja TA, Al-Mohammad KK, Aziz KM. Setting the Scene for An ARI Control Program: Is It Worthwhile in Saudi Arabia? Eastern Mediterranean Health Journal 1999; 5:111-17.
13. Khoja TA, Al-Mohammad KK, Aziz KMS. National Protocol for Diagnosis and Treatment of Acute Respiratory Infections among Children in Health Centers, First ed. Riyadh, Ministry of Health 1999; 5(1): 111-7.
14. Cockburn J, Pit S. Prescribing Behavior in Clinical Practice: Patients' Expectations and Doctors' Perceptions of Patients' Expectations-a Questionnaire Study. BMJ 1997; 315: 520-23.
15. Saudi Ministry of Economy and Planning <http://www.planning.gov.sa/i-mop/home/>.
16. Al Ayed IH, Shaikh JA, Qurashi MI. Pattern of Paediatric Emergency Room Visits at King Khalid University Hospital, Riyadh. Ann Saudi Med J 1991; 11: 171-4.
17. Dakubo GB, Commey JO. Acute Respiratory Infections in Young Children: Comparative Findings in Emergency Rooms in Accra (Ghana) and Harare (Zimbabwe). West Afr JM 1996; 15:181-5.

18. Bashour HN, Webber RH, Marshal TF. A Community-based Study of Acute Respiratory Infections among Preschool Children in Syria. *Journal of Tropical Paediatrics* 1994; 49:207-13.
19. Little P, Dorward M, and Warner G, et al. Importance of Patient Pressure and Perceived Pressure and Perceived Medical Need for Investigations, referral, and Prescribing in Primary Care: Nested Observational study. *BMJ* 2004; 328: 444-7.
20. Gonzales R, Steiner JF, Sande MA. Antibiotic Prescribing for Adults with Colds, Upper Respiratory Tract Infections, and Bronchitis by Ambulatory Care Physicians. *JAMA* 1997; 278: 901-5.
21. Nash DR, Harman J, Wald ER, et al. Antibiotics Prescribing by Primary Care Physicians for Children with Upper Respiratory Tract Infections. *Arch Pediatr Adolesc Med* 2002; 156: 1114-9.
22. Weis MC, Fitzpatrick R, Scott DK, et al. Pressures on the General Practitioners and Decisions to Prescribe. *Fam Pract* 1996; 13: 432-8.
23. Chan Acting SF. Parental Knowledge, Attitudes and Antibiotics Use for Upper Respiratory Infection in Children Attending a Primary Healthcare Clinic in Malaysia. *Singapore Med J* 2006; 47: 266-70.
24. Lucks D, Anderson MR. Antihistamines and the Common Cold: a Review and Critique of the Literature. *J Gen Intern Med* 1996; 11: 240-4.
25. Al Khaldi YM, Al Sharif AI, Al Gelban KS, et al. Impact of National Protocol on Management of Acute Respiratory Infections in children. *Saudi Med J* 2001; 22: 780-3.
26. Stewart-Brown S, Surender R, Bradlow J, et al. The Effects of Fund Holding in General Practice on Prescribing Habits Three Years after Introduction of the Scheme. *BMJ* 1995; 31: 1543-7.