

# Primary care physicians' perceptions and practices on asthma care in Aseer region, Saudi Arabia

*Abdulrhman Abudahish, FCCM, SBFM, Hassan Bella, DTM&H, PHD.*

---

## ABSTRACT

**Objective:** To determine the primary health care (PHC) physicians' knowledge, attitudes, and practices on asthma care in the sectors of Abha and Khamis Mushayt, Aseer Region, Kingdom of Saudi Arabia.

**Methods:** We conducted a cross-sectional study in Aseer region, Saudi Arabia during the period from June to July 2001. Sixty-one PHC physicians were selected randomly through 2-stage stratified sampling with proportional allocation. Self-administered questionnaires were used covering PHC physicians' knowledge, attitudes and

practices. Scoring of case scenarios on asthma care were established.

**Results:** The mean total score for the case scenarios was poor, which was 37.7% of the total marks.

**Conclusion:** The knowledge of PHC physicians on asthma care in Aseer region was not satisfactory. The study recommends the establishment of new strategy to implement and disseminate the National Protocol for Asthma Management.

**Saudi Med J 2006; Vol. 27 (3): 333-337**

---

Asthma is a common and serious health problem throughout the world. The prevalence of asthma has increased in the past 3 decades in children and adults in the US,<sup>1,2</sup> as well as Australia.<sup>3</sup> A study in the United Kingdom indicated an increase in the prevalence of asthma by more than 5.5-12%.<sup>4</sup> Saudi Arabia is not an exception, the prevalence of asthma among school children has increased significantly from 8% in 1986 to 23% in 1995.<sup>5,6</sup> Therefore, guidelines were established in many countries, including Saudi Arabia, to control and prevent this increase.

In 1995, the first edition of the National Protocol for the Management of Asthma in Saudi Arabia was published with a stepwise approach.<sup>7</sup> With the changes in classification of severity of asthma, and emphasis

on the anti-inflammatory medications as well as improvement in the health education section, the third edition of the national protocol<sup>8</sup> was published in the year 2000. Primary health care (PHC) physicians, who provides care for most cases of bronchial asthma in Saudi Arabia are the target population for the National Protocol for the Management of Asthma. Eliciting their perceptions and their beliefs on the protocol are therefore of paramount importance in addition to assessing their practices. The objective of this study is to determine PHC physicians' knowledge, attitudes, and practices on asthma care in Abha and Khamis Mushayt sector, Aseer Region, Kingdom of Saudi Arabia.

---

From Health Affairs in Eastern Province, Division of Primary Health Care (Abudahish) and from the Department of Family and Community Medicine (Bella), King Faisal University, Dammam, Kingdom of Saudi Arabia.

Received 25th September 2005. Accepted for publication in final form 5th February 2006.

Address correspondence and reprint request to: Dr Abdulrhman Abudahish, PO Box 40203, Al-Khobar 31952, Kingdom of Saudi Arabia. Tel. +966 (3) 8433611. Fax. +966 (3) 8431771. E-mail: Dahish\_99@yahoo.com

**Methods.** A cross-sectional study was designed to achieve the study objectives. The urban and rural PHC centers located in Abha and Khamis Mushayt sectors were randomly selected for inclusion in the study. The method used was self-reporting of PHC physicians. Sixty-one out of 97 physicians working in Abha and Khamis Mushayt sectors were chosen randomly. Two-stage stratified a random sample with proportional allocation had been used to select the sample size. In the first stage the PHC centers were divided into 2 strata (urban and rural PHC centers), 13 urban PHC centers were selected, and 28 out of 36 rural PHC centers were also randomly selected. In the second stage, a sample of PHC physicians was randomly selected proportionally from each stratum. Thirty physicians were from those who work in urban PHC centers, while 31 physicians were from rural PHC centers. The sample size was based on previous studies,<sup>9,10,11</sup> the average proportion of adherence of PHC physicians to asthma guidelines was calculated to be 0.6. Type I error was considered to be 0.05, and type II error to be 0.2 with the power equals to 0.8. The expected difference between proportion of the study population, and that of literature is to be 0.1. All PHC physicians who work in PHC centers for at least one year, and who are directly under supervision of the Directorate of Health Affairs in Aseer Region were included in the study. They have probably attended workshops and seminars on asthma management and practice on the National Protocol.

A self-administered questionnaire was designed to achieve the research objectives. The questionnaire was based primarily on a previous study carried by Chicago Asthma Surveillance Initiative (CASI) members in the USA. Permission was sought to modify and use the questionnaire from CASI. Likert scale, Delphi scale, and closed/open questions were used in the questionnaire. The scoring system on 7 case scenarios was used to cover physicians' knowledge on severity of bronchial asthma, treating patient with mild intermittent asthma, follow up, and referral of patients with moderate persistent asthma. The total score was 7 for 7 items. Letters were sent to the randomly selected PHC physicians to attend administering the questionnaire without informing them regarding the study. This was carried out to avoid bias that may arise if physicians have known and prepared themselves. Sixty-one PHC physicians attended at the same time to administer the questionnaires in 2 big halls in Abha and Khamis Mushayt sectors, in the presence of investigators to avoid any discussion between physicians.

Statistical Package for Social Sciences was used for statistical analysis. Data analysis was performed

both in descriptive and inferential fashions. Significant level was set to be  $p$  less than 0.05. Frequency distribution tables were constructed with the mean and standard deviation. Chi-square, t-test, analysis of variance (ANOVA) were used as appropriate. Fisher exact test and Kruskal- Wallis test were used. The questionnaire was validated through extensive review of the 3 editions of the National Protocol for Management of Asthma. According to this review, decisions were made to modify the questionnaire that was used in the USA by CASI. The reliability of data was tested by calculating the reliability coefficient ( $\alpha$ ), which was reliable ( $r=0.48$ ).

**Results.** As shown in **Table 1**, the mean total score for all the 7 case scenarios was  $2.64 \pm 1.27$  (37.7%  $\pm$  18.1%) namely; nearly one-tenth of PHC physicians achieved a score of 5 out of 7 (71% of the total scores), while most of PHC physicians (90.2%) scored below 60% of the total marks as shown in **Table 2**.

The first item represents case scenarios assessing PHC physicians' knowledge to classify asthma severity according to the national protocol; the mean total score of the 3 case scenarios related to severity classification achieved by PHC physicians was  $1.26 \pm 1.03$  (42%  $\pm$  34%) (**Table 1**). Few (16.4%) PHC physicians achieved the full marks while more than a quarter of PHC physicians (26.2%) achieved zero mark **Table 2**.

In the second item, PHC physicians achieved mean total score of  $0.28 \pm 0.64$  (14%  $\pm$  32%) for the 2 case scenarios related to treating asthma patients with mild intermittent asthma in children and adult (**Table 1**) namely, approximately one-tenth of PHC physicians (9.8%) achieved a full mark in contrast to most of PHC physicians (82%) who scored zero (**Table 2**).

The third item represents the appropriate follow up of well-controlled, moderate, persistent asthma cases at PHC centers. The PHC physicians achieved a mean score of  $0.68 \pm 0.48$  (68%  $\pm$  48%) (**Table 1**), and two-thirds of PHC physicians (66.7%) answered the question correctly (**Table 2**).

The fourth item represents answers for a case scenario that related to referring a child with moderate persistent asthma at PHC level. The mean score as shown in **Table 1** was  $0.43 \pm 0.5$  (43%  $\pm$  50%); and 42.6% of PHC physicians answered the question correctly (**Table 2**).

The age of PHC physicians, their experience since finishing from medical school, and their experience in PHC centers in Saudi Arabia have no effect on the scores of the case scenarios. When Chi-square test was used, no difference was found between the higher qualified physicians and the non-qualified in answering

**Table 1** - Scoring for case scenarios to assess primary health care physicians' knowledge on asthma care.

Case scenarios	Total number of items and their scores	Mean score $\pm$ SD of items correctly answered	Percentage of (mean $\pm$ SD)
Severity classification	3 (3)	1.26 $\pm$ 1.03	42 $\pm$ 34
Appropriate medication	2 (2)	0.28 $\pm$ 0.64	14 $\pm$ 32
Appropriate follow up	1 (1)	0.68 $\pm$ 0.48	68 $\pm$ 48
Moderate asthma	1 (1)	0.43 $\pm$ 0.5	43 $\pm$ 50
<b>Total score</b>	<b>7 (7)</b>	<b>2.64 <math>\pm</math> 1.27</b>	<b>37.7 <math>\pm</math> 18.1</b>

**Table 2** - Scoring achieved by primary health care physicians for case scenarios of asthma patients.

Case scenarios	Score	N=61 (%)
Item (1)	0	16 (26.2)
Severity classification	1	23 (37.7)
	2	12 (19.7)
	3	10 (16.4)
Item (2)	0	50 (82)
Appropriate medication for step 1	1	5 (8.2)
	2	6 (9.8)
Item (3)	0	20 (33.3)
Appropriate follow up for step 3*	1	40 (66.7)
Item (4)	0	35 (57.4)
Referral for step 3	1	26 (42.6)
<b>Total score (out of 7)</b>	0	2 (3.2)
	1	9 (14.7)
	2	18 (29.5)
	3	18 (29.5)
	4	8 (13.1)
	5	6 (9.8)
<b>*One missing</b>		

**Table 3** - Availability of essential needs for asthma care according to what physicians reported: comparison between urban and rural primary health care centers

Variable	Urban (N=30) N (%)	Rural (N=31) N (%)	Total (n=61) N (%)	P value*
<b>Peak flow meter</b>				
Available	11 (36.7)	13 (41.9)	24 (39.3)	NS
Not available	19 (63.3)	18 (58.1)	37 (60.7)	
<b>Steroid inhaler</b>				
Provided	2 (6.7)	1 (3.2)	3 (4.9)	NS
Not provided	28 (93.3)	30 (96.8)	58 (95.1)	
<b>Sodium cromoglycate</b>				
Provided	3 (10)	5 (16.1)	8 (13.1)	NS
Not provided	27 (90)	26 (83.9)	53 (86.9)	
<b><math>\beta</math>2 agonist</b>				
Provided	30 (100)	29 (93.5)	59 (96.7)	NS
Not provided	0 (0)	2 (6.5)	2 (3.3)	
NS - not significant, *Chi-square				

**Table 4** - Opinion and behavior of PHC physicians on management of asthma.

Opinion and behavior of PHC physicians	Uncertain N (%)	Never N (%)	Rarely N (%)	Sometimes N (%)	Often N (%)
Usefulness of home PFM	21 (34.4)	6 (9.8)	4 (6.6)	13 (21.3)	17 (27.9)
Usefulness of office PFM	17 (27.9)	3 (4.9)	3 (4.9)	20 (32.8)	18 (29.5)
Prescribing steroid inhaler	NA	19 (31.1)	19 (31.1)	21 (34.4)	2 (3.3)
Prescribing cromoglycate inhaler*	NA	12 (20)	11 (18.3)	29 (48.3)	8 (13.3)
Develop treatment plan*	NA	2 (3.3)	6 (10)	15 (25)	37 (61.7)

PHC - primary health care, PFM - peak flow meters, NA - not applicable, \*One missing

case scenarios. As shown in **Table 3**, nearly, 40% of all urban and rural PHC physicians reported that their PHC centers were supplied with peak flow meters (PFM) with no significant difference between urban and rural. Few PHC physicians reported that they had steroid inhalers and sodium cromoglycate inhalers while almost all urban and rural PHC physicians (96.7%) reported that their PHC centers were supplied with  $\beta$ 2 agonist, and there is no significant difference between urban rural PHC centers.

**Table 4** shows PHC physicians' opinions, and practices on usefulness of PFM at home and in the office, and how often they prescribed anti-inflammatory medications and developed treatment plan. Nearly one-third of PHC physicians were uncertain on the usefulness of PFM in the office and at home. More than quarter of physicians thought that using PFM at home was often useful and 29.5% of them thought that using PFM at office was often useful. Nearly two-thirds of physicians never or rarely prescribed the steroid inhaler for their patients, while approximately half of physicians sometimes prescribed sodium cromoglycate for their patients. Nearly two-thirds of physicians reported they often developed treatment plan for their patients.

**Discussion.** As seen from the results, the status of PHC physicians' knowledge on their practices on asthma care in Aseer region was not satisfactory. For each case scenario the results were very poor, except the item number 3, which is related to the follow up of patient with well-controlled moderate persistent asthma at PHC (**Table 1 & 2**). The mean total score percentage was  $37.7\% \pm 18.1$ . Nearly one-tenth of PHC physicians achieved a score of 5 out of 7 (71% of the total scores), whereas most of PHC physicians (90.2%) scored below 60% of the total marks. This result is unexpected, when compared with the mean total score percentages of Al-Hadad et al<sup>12</sup> (61%), Finkstien et al<sup>9</sup> (74%), and Doerschug et al<sup>10</sup> (60%)

studies. Considering different study populations and methods of data collection in Finkstien et al,<sup>9</sup> and Doerschug et al<sup>10</sup> might help to explain the differences in the results. Also, primary care physicians in USA include internist, pediatricians, and family physicians. Moreover, in Doerschug et al<sup>10</sup> study, chest specialists were included in the study sample. The mean total score in estimating severity of asthma in our study was  $42\% \pm 34$  while in Doerschug et al<sup>10</sup> study, no group of physicians scored at least 65% in estimating disease severity, and the mean total score was 46%. The high standard deviation in the current study may explain the degree of variation of ability of physicians to determine asthma severity.

The classification of severity of asthma in the protocol was written in paragraphs, then was rewritten in Tables as part of pharmacological management of asthma for children and adults. Confusion may occur when classification between children and adults regarding symptoms of asthma, nocturnal symptoms or exacerbation, peak expiratory flow between attacks, PEF variability. The reason for confusion is probably related to the way of writing classification of severity. The classification is not based on cut off point of age group such as children more than 5 years, and 5 years and younger, as the former age group could not use the PFM. Some mistakes were noticed in the tables of severity classification of asthma in the national protocol when compared with what were written in the paragraphs. Although, most cases seen usually at PHC are mildly intermittent asthma and the drug of choice is simply  $\beta$ 2 agonist, most of PHC physicians (82%) achieved zero mark when they were assessed in the selection of the appropriate medications for mild intermittent asthma in children and adults. These poor results were unexpected, and may be related to misunderstanding of the national protocol if compared with the results of Doerschug et al<sup>10</sup> study. Two-thirds of PHC physicians (66.7%) answered correctly the question related to the follow up of the patient with

well-controlled moderate persistent asthma at PHC every 2-3 months as indicated in the national protocol. Significantly, younger PHC physicians had better answers than older physicians in the follow up of patients with moderate persistent asthma. More than half of those who answered the scenario incorrectly did not prefer to follow up on their patients except if they are symptomatic. Despite moderate persistent asthma as an indication for referral to specialists as mentioned in the national protocol, only 43% of physicians preferred to refer these patients to the specialists. The rest of the physicians who did not prefer to refer achieved zero mark.

In summary, these poor results achieved by PHC physicians indicate that there is a poor understanding of the National Protocol for Management of Asthma.

A randomized clinical trial proved the long-term impact of an interactive seminar during education program for physicians.<sup>13</sup> Questions should be raised on effectiveness of the courses carried out for training physicians. Even if effective education program is carried out, lack of PFM in the PHC centers, might lead trained physicians after a period of time to be unfamiliar with using PFM. Nearly 40% of the PHC physicians reported that their PHC centers were supplied with PFM. Awarding continuing medical education (CME) credit when improved adoption is demonstrated could link patient outcomes to physician education, thus gaining physicians support for such programs.<sup>13</sup> The current study showed that knowledge, attitudes, and practices of PHC physicians on asthma management in Abha and Khamis Mushayt sectors, Aseer region, was consistently low. Factors that might have led to this result include: The National Protocol was not written in simple comprehensible style in the section of severity classification of asthma; inadequate training of physicians on the national protocol; unavailability of the essential needs in the management of asthma, and lack of auditing system, weak background of PHC physicians' knowledge, and attitudes toward asthma management.

The authors recommend to review the strategy of implanting the national protocol and establishing effective CME on these protocols.

**Acknowledgment.** We would like to thank all PHC physicians who participated in the study. Special thanks to Dr. Abdulla Al-Sharif; General Director of Aseer Health Affairs for

his valuable support. Our thanks also extended to the Chicago Asthma Surveillance Initiative (CASI) for supplying us with the origin of the questionnaire. Our deep thanks are due to Dr. Ahmad Bahnassy, for his help in statistical analysis. In addition, our thanks for Dr. Abdul-Aziz Al-Sabiani for his review the article.

## References

1. Burney PG, Chinn S, Rona RJ. Has the prevalence of asthma increased in children? Evidence from the national study of health and growth 1973-86. *BMJ* 1990; 300: 1306-1310.
2. Burr ML. Is asthma increasing? *J Epidemiol Community Health* 1987; 41: 185-189.
3. Peat JK, Van Den Berg RH, Mellis CM, Leeder SR, Wolcock AJ. Changing prevalence of asthma in Australian children *BMJ* 1994; 308: 1591-1596.
4. Burr ML, Butland BK, King S, Vaughan-Williams E. Changes in asthma prevalence: two survey 15 years apart. *Arch Dis Child* 1989; 64: 1452-1456.
5. Al-Frayh AR, Bener A, Al-Jawadi TQ. Prevalence of asthma among Saudi school children. *Saudi Med J* 1992; 13: 521-524.
6. Al-Frayh AR, Shakoor Z, Gad EL, Rab MO, Hasnain SM. Increased prevalence of asthma in Saudi Arabia. *Ann Allergy Asthma Immunol* 2001; 86: 292-296.
7. The National Scientific Committee of Bronchial Asthma. National Protocol for Management of Asthma. 1st edition. General Directorate of Health Centers, Ministry of Health (MOH); Saudi Arabia; 1995.
8. The National Scientific Committee of Bronchial Asthma. National Protocol for Management of Asthma. 3rd edition. General Directorate of Health Centers, Ministry of Health (MOH); Saudi Arabia; 2000.
9. Finkelstein JA, Iozono P, Shulruff R, Inui TS, Soumerai SB, Ng M, et al. Self-reported physician practices for children with asthma: are national guidelines followed? *Pediatrics* 2000; 106: 886-896.
10. Doerschug KC, Peterson MW, Dayton CS, Kline JN. Asthma guidelines, an assessment of physician understanding and practice. *Am J Respir Crit Care Med* 1999; 159: 1735-1741.
11. Grant EN, Moy JN, Turner-Roan K, Daugherty SD, Weiss KB. Asthma care practices, perceptions, and beliefs of Chicago-area primary-care physicians. *Chest* 1999; 116: 145S-154S.
12. Al-Haddad N, Al-Ansari SS, Al-Shari AT. Impact of asthma education program on asthma knowledge of general practitioners. *Ann Saudi Med* 1997; 17: 550-552.
13. Clark NM, Gong M, Schork MA, Kaciroti N, Evans D, Roloff D, et al. Long-term effects of asthma education for physicians on patients satisfaction and use of health services. *Eur Respir J* 2000; 16: 15-21.