

Assessment of family and internal medicine physicians knowledge and practice of bronchial asthma at Riyadh city

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ABSTRACT

Background: The prevalence of bronchial asthma (BA) is increasing in the Kingdom of Saudi Arabia. The knowledge and adherence to guidelines by physicians can play a major role in controlling asthma. **Aim:** To assess the knowledge and practice of family medicine and internal medicine physicians about BA at King Saudi University medical city in Riyadh, Kingdom of Saudi Arabia. **Methodology:** A cross-sectional survey study was conducted. All family and internal medicine physicians at King Khalid University Hospital were included. A total of 180 physicians participated. The questionnaire was developed according to the Global Initiative for Asthma (GINA) guideline to assess the knowledge and practice of physicians towards bronchial asthma, included questions (diagnosis, severity classification, management, and referral). **Results:** All participated physicians knowledge and practice level about BA was low; the average scores were around 50%. The comparison between family and internal medicine physicians' knowledge shows insignificant differences. The only exception is the management part; family medicine physicians show better results than internal medicine physicians. The years of experience and higher qualification show significant improvement in the level of the knowledge scores. **Conclusion:** The knowledge of physicians about the diagnosis, assessment of severity, management, and referral of BA was unsatisfactory. We recommend an adoption of a special asthma clinic for teaching, supervising, and managing purposes assigned to an expert consultant.

Keywords: Asthma, family medicine physicians, internal medicine physicians, knowledge, practice, primary care physicians

Introduction

Asthma is a major cause of disability, health resource utilization, and a poor quality of life for those who are affected. It is the most common chronic disease among children and young adults.^[1] Worldwide it has been estimated that annually 15 millions Disability-Adjusted Life Years (DALYs) lost due to uncontrolled

asthma.^[2] This estimation means that asthma is responsible for approximately 1% of DALYs lost, similar to diabetes, cirrhosis, or schizophrenia.^[2] This issue reflects the high prevalence and severity of the disease. Asthma prevalence in Saudi Arabia is 3.54–4.62% as it is listed at the top of the common chronic diseases in Saudi Arabia.^[3] Moreover, worldwide asthma prevalence is 4.5%, thus the current world population of 7 billion translates to 315 million individuals with asthma.^[1]

Asthma control is a considerable concern in Saudi Arabia. A study was carried out to evaluate asthma control in Saudi Arabia concluded that only 64% were uncontrolled.^[4] Many important factors play a role in extending of this burden, such

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as poor knowledge, hesitancy when using new drugs, and poor awareness of the importance of controlling asthma.^[5] These factors are common among primary care physicians caring for asthma patients.^[5] One European study suggested that general practitioners (GPs) were competent at excluding those who did not have asthma (specificity 99%) but less competent in correctly diagnosing those who had current asthma (sensitivity 59%), which suggests an under-diagnosis of asthma.^[6] An observation found in Saudi Arabia at the North-West Armed Forces Hospital in Tabuk City, reported that the general knowledge, diagnosis, classification of severity, and management of bronchial asthma by family physicians was low.^[7] Another study also found that primary health care (PHC) physicians' knowledge of asthma care in Asser Region, Saudi Arabia was not satisfactory.^[5] Offering the best possible treatment strategy, implementing the recommended follow-up durations, and assuring adherence to the treatment plan on patients, all these interventions were mostly affected by physicians' knowledge and practice.^[8] The optimal method to enhance the control of the disease is to improve physicians knowledge and practice.^[9] Evidence-based clinical guidelines provide last updated scientific knowledge to the clinical practice, which offers both evidence and instructional components.^[9] The global initiative for asthma (GINA) is one of the most used guideline worldwide.^[10] Many countries adopt their national asthma protocols from GINA. Saudi initiative for asthma (SINA) is local guideline developed from GINA in 2009.^[7] This study conducted to assess the level of knowledge and practice of family and internal medicine physicians in approach to patients with asthma based on GINA recommendations, at King Saud University medical city, Riyadh.

Methodology

A cross-sectional study was conducted at King Saud University medical city in Riyadh. All family and internal medicine physicians, including consultants, registrars, residents, and GPs on duty from March to June 2016 were invited to participate in this study. The questionnaire was developed according to GINA guidelines to assess the knowledge and practice of physicians towards bronchial asthma (BA). The questionnaire was divided into two parts; 1st part included socio-demographic data (age, gender, specialty, qualification, experience years, and clinical position), 2nd part included questions assessing clinical practice and theoretical knowledge about bronchial asthma (diagnosis, severity classification, management, and referral). The questionnaire was developed after revision and validation by two family medicine and two internal medicine consultants. A pilot study was conducted to assess the clarity and reliability of the questionnaire and the time needed to complete it by 3rd and 4th year family medicine residents during the half day releasing activity. The questionnaires were distributed to all staff members in family and internal medicine departments; physicians were offered to fill the questionnaire after taking their consent and the explanation of the study aim. The questionnaires were distributed during the clinic breaks, clinical activity, half day releasing activity, and daily morning reports. The collected

data was verified and analyzed by Statistical Package for Social Science (SPSS) Version 21. A descriptive analysis of the data was done and presented in tables. The physicians were instructed to choose the single best answer among the 11 multiple choice questions on the knowledge of BA. Each correct answer was given a score of 1 and an incorrect answer a score of 0. The mean knowledge score was calculated by the summation of scores. For quantitative analysis, an independent t-test and one-way ANOVA were employed. The level of significance was taken as $P < 0.05$.

Administrative approval was obtained from the research ethics committee at King Saud University medical city. Physicians were invited to participate in the study after the objectives were explained. They were reassured of the confidentiality of the collected information.

Result

180 physicians out of 255 were included in the study; the response rate was 71%. The response rate was almost similar among family and internal medicine physicians (71% and 70%).

Table 1 summarized the socio-demographic characteristics of the participated physicians. Almost 43% of participated physicians were of the group age of 25–29 years and 53% were males. Internal medicine participants were more than family medicine; (56% VS 44%). The majority of physicians are qualified with a bachelor degree (MBBS) 61% and 24% holding board/Ph.D. The half of the physicians are residents and their experience less than five years 50%, the participated consultants 35 (19%) were more than senior registrar and GPs.

Table 2 shows the distribution of the correct answers by physician's specialty. The questions about diagnosis criteria and confirmation of diagnosis by reversibility test for all were under 50%, on the otherhand diagnosis confirmation by pulmonary function test was the highest with 72% correct answer for all physicians, the difference was insignificant in the diagnosis questions between family and internal medicine. Severity assessment by BA symptoms control tool was the highest percentage 64% in the severity assessment questions part, whereas the ability of physicians to determine the severity level for an asthmatic patient by peak expiratory flow meter were very poor 35%. Stepwise approach treatment adjustment and treatment adjustment period questions were 59% and 53% respectively. The physicians who answered correctly about pregnancy category for short-acting bronchodilator medications were very low 31%. More than 67% of physicians answered correctly about when they have to refer an asthmatic patient in urgent and uncontrolled conditions.

Table 3 shows mean knowledge scores between family and internal medicine physicians in four practice aspects. The overall knowledge scores were around 50% for both family and internal medicine physicians. For diagnosis, severity classification, and referral the difference was statistically insignificant. The

management scores demonstrate that family medicine better than internal medicine in the management part and it is the only aspect that had significant difference.

Table 4 shows mean knowledge scores with physicians' background. According to the age groups, the overall knowledge scores are increasing with the increasing of the age. The lowest

level of knowledge was the youngest group (25 to 29 years) and their average scores is 46%, the highest level was for the oldest age group (40 to 49 years) and their average scores is 55%. The difference between the four age groups is statistically significant. Also the qualifications of physicians overall knowledge scores were improving with increasing of the qualifications. The lowest level of knowledge were (diploma or master degree) physicians their average scores 45%, the highest level was (subspecialty or fellowship degree), and their average scores is 57%. The difference between the qualifications levels is statistically significant. Again the scores are improving with longer experience duration, the lowest scores were (5 years and less group), and the highest scores are for (>16 years group), the difference was statistically significant. The consultants had the highest scores 58%, the service residents (GPs) were better than residents on training with a small difference. The difference between the five clinical positions was statistically significant. About 61% of the study sample follows guidelines in their management, 33% sometimes follow and the difference were statistically insignificant.

Table 5 demonstrates the mean knowledge scores of physicians with the different types of guidelines followed. The physicians who followed SINA guideline had the highest knowledge score 56% than GINA 53%, the difference was statistically insignificant. The majority of the physicians followed GINA 108 (60%), the least followed British thoracic society 9%.

Discussion

Asthma is still significant health issue in Kingdom of Saudi Arabia due to the high number of BA cases and their negative impact on costs and potential productivity. The lack of appropriate knowledge and practice may contribute for the high number of uncontrolled asthma.^[11,12] Therefore, we focused on the current knowledge and practice of the physicians in approach to BA patients.

All participated physicians' knowledge and practice level about BA is suboptimal including diagnosis, assessment of severity, management, and referral. This result is consistent with the findings of previous National studies. Study conducted among primary care physician and family residents that showed the level

Table 1: Socio-demographic characteristics of the participated physicians (n=180)

Variable	Frequency	Percentage
Age (years)		
25-29	77	42.8
30-39	49	27.2
40-49	32	17.8
>50	22	12
Total	180	100.0
Gender		
Male	96	53.33
Female	84	46.67
Total	180	100.0
Specialty		
Family Medicine	78	44
Internal Medicine	101	56
Total	179*	100.0
Qualification		
MBBS	109	60.7
Diploma/Master	4	2.3
Board/PHD	44	24.6
Subspecialty/Fellowship	22	12.4
Total	180	100.0
Years of experience		
< 5y	90	50
6 - 10y	22	12
11 - 15y	20	11
> 16y	48	27
Total	180	100.0
Clinical position		
Service Resident	22	12.2
On Training Resident	90	50.0
Senior Registrar	33	18.3
Consultant	35	19.4
Total	180	100.0

* One physician did not state his/her specialty.

Table 2: Distribution of correct answers by physician's specialty (n=180)

Knowledge or practice aspect	FM* Freq. (%)	IM* Freq. (%)	Total Freq. (%)
BA* diagnostic criteria	33 (42%)	46 (45%)	79 (43%)
Confirmation of diagnosis by bronchodilator reversibility test	34 (44%)	51 (50%)	85 (47%)
Confirmation of diagnosis by pulmonary function test	57 (73%)	72 (71%)	129 (72%)
BA* severity assessment retrospectively	39 (50%)	52 (51%)	91 (50%)
Severity assessment by BA* symptoms control tool	54 (69%)	62 (61%)	116 (64%)
Determine the patient severity level by PEF*	25 (32%)	39 (39%)	64 (35%)
Treatment adjustment by stepwise approach	45 (58%)	62 (61%)	107 (59%)
Treatment adjustment period by stepwise approach	50 (64%)	45 (45%)	95 (53%)
Short bronchodilators and pregnancy contraindication status	28 (36%)	28 (28%)	56 (31%)
Urgent referral indication	54 (69%)	66 (65%)	120 (67%)
BA* specialist referral indication	55 (69%)	67 (65%)	122 (68%)

* FM=Family Medicine, IM =Internal Medicine, BA =Bronchial Asthma, PEF =peak expiratory flow meter.

Table 3: Mean knowledge scores of family and internal medicine physicians in four practice aspects (n=180)

knowledge aspects	Specialty	Mean (SD)	Mean %	T-test P
Diagnosis	Family Medicine	1.59 (±0.874)	53	0.520
	Internal Medicine	1.67 (±0.850)	56	
Assessment of Severity	Family Medicine	1.51 (±0.698)	50	0.987
	Internal Medicine	1.51 (±0.890)	50	
Management	Family Medicine	1.58 (±0.748)	53	0.031
	Internal Medicine	1.34 (±0.725)	45	
Referral	Family Medicine	1.05 (±0.622)	52	0.316
	Internal Medicine	0.96 (±0.582)	48	
Total scores	Family Medicine	5.73 (±1.633)	52	0.348
	Internal Medicine	5.49 (±1.803)	50	

Diagnosis: 3 items, Severity: 3 items, management: 3 items, referral: 2 items, total: 11 items.

Table 4: Mean knowledge scores of physicians according to their socio-demographic characteristics and guidelines follow. (n=180)

Variable	Mean (SD)	Mean %	P
Age (years)*			
25-29	5.05 (±1.87)	46	0.003
30-39	5.84 (±1.54)	53	
40-49	6.09 (±1.5)	55	
> 50	6.18 (±1.29)	56	
Gender**			
Male	5.65 (±1.95)	51	0.637
Female	5.52 (±1.43)	50	
Specialty**			
Family Medicine	5.73 (±1.63)	52	0.348
Internal Medicine	5.49 (±1.80)	50	
Qualification*			
MBBS	5.21 (±1.78)	47	0.001
Diploma/Master	5.0 (±2.16)	45	
Board/PHD	6.20 (±1.44)	56	
Subspecialty/Fellowship	6.32 (±1.42)	57	
Years of experience*			
< 5y	5.11 (±1.82)	46	0.001
6 - 10y	5.59 (±1.62)	51	
11 - 15y	5.95 (±1.53)	54	
> 16y	6.33 (±1.19)	58	
Clinical position*			
Service Resident	5.41 (±1.33)	49	0.002
On Training Resident	5.18 (±1.84)	47	
Senior Registrar	6.03 (±1.57)	55	
Consultant	6.34 (±1.45)	58	
Following guidelines*			
Following	5.64 (±1.70)	51	0.168
Not following	4.64±2.33)	42	
Sometimes	5.67 (±1.62)	52	

* ANOVA test. ** Two-independent samples t-test

of knowledge was 41% with poor knowledge. Another study reported that the general knowledge, diagnosis, classification of severity, and management by family physicians was low.^[7,12] Poor understanding and adherence to asthma guidelines strategies and insufficient efforts by physicians to improve their knowledge along with training are the reasons that may account for this low knowledge finding.^[13,14] Ernest in South Africa noted that

most general practitioners do not fully adhere to the clinical guideline recommendations.^[15] This finding could reflect on the asthmatic patients' outcome and may play a major role in the poor control of the disease resulting in frequent emergency visits and admissions. A clinical trial finding shows significant relation between physicians' knowledge and better control of the disease.^[16]

The comparison between family and internal medicine physicians was insignificant regarding the total knowledge scores, except in the management section family medicine physicians were better than internal medicine with a significant difference. Two studies reports show that internal medicine and family medicine physicians almost similar, where the difference was found to be insignificant.^[16,17] It is difficult to identify the reasons of the similarities between both groups, but may be they have equal chances in the exposure to patients, quality of educational training program, and clinical setting on BA cases. Regarding the superiority of family physicians in the management part, this could be attributed to the fact that family physicians have more chances to see asthmatic patients in their clinics. This result probably reflects increased exposure to the guidelines in forums such as publications, professional meetings, and other forms of continuing education.^[13] Al Khobar's study also found the management part scores for family physicians were better than others and statistically significant.^[12]

During the study we recognized an important finding showing positive impact of years of experience and the highest qualification on the level of knowledge, increasing of experience years or improving qualification shows significant improvement in the degree of the knowledge. Other studies agree with our finding and approve the relation between the experience and qualification factors with the level of knowledge.^[16,18,19] This approves that the variations among the physicians based on personal self-improvement along with his/her clinical training period had an effect on the level of knowledge. Despite the positive impact of experience and qualifications, all physician groups displayed under expectation scores.

The study found a low level of asthma knowledge among both guideline and non-guideline users. Also, it shows an insignificant difference in the knowledge between both of them and they were almost equal. Consistent with the study done about diabetes guideline concluded a low level of diabetes-related knowledge among both guideline and non-guideline users. However, clinical guideline use is associated with significantly better diabetes-related knowledge, and this is against our findings.^[20] A previous study supports the guidelines use had no significant change on the level of knowledge.^[21] The interpretation of the findings is limited by the size of the study population of both groups which are small, that could make the percentages misleading.

In conclusion, this study demonstrated that the knowledge and practice of physicians at Riyadh, King Saud University medical city on the diagnosis, severity assessment, management, and referral about BA are low. These findings are consistent with most of the

Table 5: Mean knowledge scores of physicians with different types of guidelines follow. (n=180)

Guidelines followed*	n (%)	Mean (SD)	Mean %	P
GINA	108 (60)	5.83 (±1.55)	53	0.227
SINA	58 (32)	6.12 (±1.56)	56	
NICE	59 (33)	5.46 (±1.98)	50	
American thoracic society	32 (18)	5.81 (±1.35)	52	
British thoracic society	17 (9)	5.59 (±1.58)	50	

*GINA=Global Initiative for Asthma, SINA =Saudi Initiative for Asthma, NICE =National Institute for Health and Care Excellence

national and international studies, in spite of the high percentage of the participants who use guidelines in their practice, all physicians show under expected knowledge. Based on the study findings such as: age, years of experience, clinical positions, and highest qualifications and its positive impact on the knowledge level, we recommend to organize special asthma clinics for teaching, supervising, and ideal managing purposes assigned to expert consultants.

Limitations

The sample size of physicians participated in the study were insufficient for statistically conclusive results. Therefore, the results cannot be generalized. Further investigations with larger population size are recommended.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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