

Knowledge, attitude, and practice of physicians toward asthma inhaler techniques in Qassim, Saudi Arabia

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ABSTRACT

Introduction: Asthma is a chronic inflammatory disease of the airways. Inflammation in airways leads to hypersensitivity and airway obstruction which is responsible for the symptoms of asthma like wheezing, dyspnea, chest tightness and cough that aggravates in the morning. The prevalence ranges from 1.1 to 9.9% in adults. Systemic therapy and inhalational therapy comprising of bronchodilators and steroids are the two major treatment options. **Aims & objectives:** To assess physicians knowledge, attitude & practice toward asthma inhaler devices and inhalation techniques, and classify physician's attitudes as either poor or adequate. **Methodology:** A cross sectional study was conducted in Qassim, Saudi Arabia among health care providers for a duration of 6 months. Practicing physicians in the three major cities in Qassim were included in the study while non-practicing physicians and those practicing in the small cities and peripheries were excluded. Data collection was done by using a predesigned self-reported online questionnaire consisting of 22 items under 3 major sections- demography, knowledge and practice of physicians. Templates were generated in MS Excel sheet and analysis of data was done using SPSS software. Chi square test was the test of significance used and $p < 0.05$ was considered significant. **Results:**

Metered-dose inhaler (MDI) with a spacer (56, 62.2%) was the most preferred device among dry powder inhalers (18, 20%) and nebulization solution (16, 17.8%). Most of the physicians responded correctly that the first and foremost step in correct MDI inhalation was shaking the device (67, 74.4%). More than three-fifths (57, 63.3%) of physicians claimed to have taught the caregivers oneach visit to use an inhaler. The increasing age of the physician was found to be associated with a better understanding, positive attitude and good practice. A significant difference was seen based on the nationality ($p = 0.003$) and the speciality of the physician ($p = 0.012$) in their understanding of inhaled corticosteroids. **Conclusion:** Older male physicians and a family physicians rather than a general physician were found to have better knowledge and a positive attitude toward advising patients regarding inhalers.

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INTRODUCTION

Bronchial asthma (BA) is one of the most common chronic health problems. It is characterized by inflammation of the airways. The airway constricts in response to one or perhaps more triggers such as extrinsic stimulants, irritants, cold air, fatigue or emotional stress, culminating in an inflammatory response and intermittent airway obstruction.¹ The pathophysiology centers around bronchial hyperresponsiveness caused by an inflammatory process driven mostly by T-helper type 2 cells in genetically susceptible persons. Cough, chest tightness, shortness of breath, and expiratory wheezing, especially late at night or early in the morning, are the most noticeable symptoms of an asthma attack.²

According to the World Health Organization, asthma affected 262 million people in 2019 and killed 455,000 people.³ It affects up to 300 million individuals globally, with an additional 100 million people expected to develop bronchial asthma by 2025.⁴ The prevalence of bronchial asthma in adults varies by nation and ranges from 1.1 to 9.9% in adults.⁵ Asthma was formerly assumed to be more common in high-income countries than in low-income countries; however, new data suggests an increased clustering of cases in low- and middle-income countries, implying an increased global burden.⁶

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Table 4: Association of age with knowledge levels, attitude, and practices of physicians towards asthma inhaler techniques

The number of asthma patients per week :	1-10	26	96.3	23	76.7	23	69.7	72	80.0	0.032
	11-20	1	3.7	7	23.3	10	30.3	18	20.0	
Your knowledge of inhaler use comes mainly from :	Attending meetings, courses, or workshops organized by scientific societies	8	29.6	10	33.3	19	57.6	37	41.1	0.024
	Reading articles or books specializing in the topic	9	33.3	8	26.7	2	6.1	19	21.1	
	Learned from practice or other physicians at your center	7	25.9	5	16.7	8	24.2	20	22.2	
	Attending meetings, courses, or workshops organized by pharmaceutical industries	0	0.0	5	16.7	4	12.1	9	10.0	
	Reading the leaflet included with the inhaler devices	3	11.1	2	6.7	0	0.0	5	5.6	
Which device do you prefer?	Metered-dose inhaler (MDI) with spacer (aero chamber)	15	55.6	19	63.3	22	66.7	56	62.2	0.273
	Dry powder inhaler (DPI)	8	29.6	3	10.0	7	21.2	18	20.0	
	Nebulization solution	4	14.8	8	26.7	4	12.1	16	17.8	
The first step for correct MDI (with aero chamber) inhalation is:	Shake the device before Use	20	74.1	21	70.0	26	78.8	67	74.4	0.375
	Exhale deeply before inhalation	0	0.0	3	10.0	2	6.1	5	5.6	
	Connect MDI to a spacer	5	18.5	2	6.7	4	12.1	11	12.2	
	Inhale deeply and forcefully	2	7.4	2	6.7	0	0.0	4	4.4	
	Continue deep, slow inspiration	0	0.0	2	6.7	1	3.0	3	3.3	
The second step for correct MDI (with aero chamber) inhalation is :	Connect MDI to a spacer	14	51.9	13	43.3	23	69.7	50	55.6	0.107
	Inhale deeply and forcefully	0	0.0	5	16.7	3	9.1	8	8.9	
	Continue deep, slow inspiration	6	22.2	3	10.0	1	3.0	10	11.1	
	Shake the device before inhalation	4	14.8	4	13.3	4	12.1	12	13.3	
When you instruct a child caregiver to use a spacer (aero chamber), where do you fix the end of the spacer (mask type)?	Over nose	12	44.4	4	13.3	5	15.2	21	23.3	0.043
	Over mouth	4	14.8	6	20.0	8	24.2	18	20.0	
	Over nose and mouth	11	40.7	20	66.7	20	60.6	51	56.7	
The next step for correct MDI inhalation after activation of the device once is :	To take 3 breaths	10	37.0	4	13.3	14	42.4	28	31.1	0.134
	To take 6 breaths	9	33.3	12	40.0	9	27.3	30	33.3	
For how long you should wait before the next actuation of the device:	To wait for 5 seconds	8	29.6	14	46.7	10	30.3	32	35.6	0.365
	10 seconds	17	63.0	13	43.3	19	57.6	49	54.4	
	20 seconds	5	18.5	12	40.0	7	21.2	24	26.7	
	30 seconds	5	18.5	5	16.7	7	21.2	17	18.9	
Which of the following is true regarding the use of inhaled corticosteroids:	Wash your mouth after each use to prevent thrush	9	33.3	19	63.3	24	72.7	52	57.8	0.087
	To minimize its use due to side effects	7	25.9	5	16.7	4	12.1	16	17.8	
	It can stunt children's growth	9	33.3	5	16.7	5	15.2	19	21.1	
	Inhaled steroids are harmful	2	7.4	1	3.3	0	0.0	3	3.3	
The most important step for correct DPI inhalation is :	Exhale deeply before inhalation	4	14.8	12	40.0	12	36.4	28	31.1	0.174
	Shake the device before inhalation	8	29.6	7	23.3	5	15.2	20	22.2	
	Inhale deeply and forcefully	8	29.6	3	10.0	10	30.3	21	23.3	
	Firing the device after beginning inspiration	6	22.2	4	13.3	3	9.1	13	14.4	
	Continue deep and slow inspiration	1	3.7	4	13.3	3	9.1	8	8.9	
Do you always teach the child's guardian about the use of inhalers?	Only first time	17	63.0	9	30.0	4	12.1	30	33.3	0.000
	In each visit	8	29.6	21	70.0	28	84.8	57	63.3	
	Never	2	7.4	0	0.0	1	3.0	3	3.3	



Factors	Categories	Gender						P-value
		Male		Female		Total		
		N	%	N	%	N	%	
When you instruct a child caregiver to use a spacer (aero chamber), where do you fix the end of the spacer (mask type)?	Over nose	7	16.3	14	29.8	21	23.3	0.215
	Over mouth	11	25.6	7	14.9	18	20.0	
	Over nose and mouth	25	58.1	26	55.3	51	56.7	
The next step for correct MDI inhalation after activation of the device once is :	To take 3 breaths	12	27.9	16	34.0	28	31.1	0.489
	To take 6 breaths	13	30.2	17	36.2	30	33.3	
	To wait for 5 seconds	18	41.9	14	29.8	32	35.6	
For how long you should wait before the next actuation of the device:	10 seconds	23	53.5	26	55.3	49	54.4	0.891
	20 seconds	11	25.6	13	27.7	24	26.7	
	30 seconds	9	20.9	8	17.0	17	18.9	
Which of the following is true regarding the use of inhaled corticosteroids:	Wash your mouth after each use to prevent thrush	27	62.8	25	53.2	52	57.8	0.811
	To minimize its use due to side effects	7	16.3	9	19.1	16	17.8	
	It can stunt children's growth	8	18.6	11	23.4	19	21.1	
	Inhaled steroids are harmful	1	2.3	2	4.3	3	3.3	
	Exhale deeply before inhalation	14	32.6	14	29.8	28	31.1	
The most important step for correct DPI inhalation is :	Exhale deeply before inhalation	17	31.5	11	30.6	28	31.1	0.824
	Shake the device before inhalation	13	24.1	7	19.4	20	22.2	
	Inhale deeply and forcefully	11	20.4	10	27.8	21	23.3	
	Firing the device after beginning inspiration	9	16.7	4	11.1	13	14.4	
	Continue deep and slow inspiration	4	7.4	4	11.1	8	8.9	
Do you always teach the child's guardian about the use of inhalers?	Only first time	23	42.6	7	19.4	30	33.3	0.064
	In each visit	29	53.7	28	77.8	57	63.3	
	Never	2	3.7	1	2.8	3	3.3	
When is it recommended to wash the spacer with warm water and a detergent:	After each use	25	46.3	13	36.1	38	42.2	0.075
	Once weekly	8	14.8	13	36.1	21	23.3	
	Once monthly	12	22.2	8	22.2	20	22.2	
	Never wash	9	16.7	2	5.6	11	12.2	
	The patient's preference	12	22.2	10	27.8	22	24.4	

Table 7: Association of Medical Specialties with knowledge levels, attitude, and practices of physicians towards asthma inhaler techniques

Factors	Categories	Medical specialty						P-value
		General practitioner		Family Medicine		Total		
		N	%	N	%	N	%	
The number of asthma patients per week :	1-10	48	80.0	24	80.0	72	80.0	1.000
	11-20	12	20.0	6	20.0	18	20.0	
Your knowledge of inhaler use comes mainly from :	Attending meetings, courses, or workshops organized by scientific societies	23	38.3	14	46.7	37	41.1	0.930
	Reading articles or books specializing in the topic	13	21.7	6	20.0	19	21.1	
	Learned from practice or other physicians at your center	14	23.3	6	20.0	20	22.2	
	Attending meetings, courses, or workshops organized by pharmaceutical industries	6	10.0	3	10.0	9	10.0	

Factors	Categories	Medical specialty				Total	P-value	
		General practitioner		Family Medicine				
Which device do you prefer?	Reading the leaflet included with the inhaler devices	4	6.7	1	3.3	5	5.6	0.409
	Metered-dose inhaler (MDI) with spacer (aero chamber)	37	61.7	19	63.3	56	62.2	
	Dry powder inhaler (DPI)	14	23.3	4	13.3	18	20.0	
	Nebulization solution	9	15.0	7	23.3	16	17.8	
The first step for correct MDI (with aero chamber) inhalation is:	Shake the device before Use	43	71.7	24	80.0	67	74.4	0.213
	Exhale deeply before inhalation	5	8.3	0	0.0	5	5.6	
	Connect MDI to a spacer	9	15.0	2	6.7	11	12.2	
	Inhale deeply and forcefully	2	3.3	2	6.7	4	4.4	
	Continue deep, slow inspiration	1	1.7	2	6.7	3	3.3	
The second step for correct MDI (with aero chamber) inhalation is :	Connect MDI to a spacer	33	55.0	17	56.7	50	55.6	0.323
	Inhale deeply and forcefully	3	5.0	5	16.7	8	8.9	
	Continue deep, slow inspiration	7	11.7	3	10.0	10	11.1	
	Shake the device before inhalation	10	16.7	2	6.7	12	13.3	
	Exhale deeply before inhalation	7	11.7	3	10.0	10	11.1	
When you instruct a child caregiver to use a spacer (aero chamber), where do you fix the end of the spacer (mask type)?	Over nose	14	23.3	7	23.3	21	23.3	0.508
	Over mouth	14	23.3	4	13.3	18	20.0	
	Over nose and mouth	32	53.3	19	63.3	51	56.7	
	To take 3 breaths	20	33.3	8	26.7	28	31.1	
The next step for correct MDI inhalation after activation of the device once is :	To take 6 breaths	22	36.7	8	26.7	30	33.3	0.294
	To wait for 5 seconds	18	30.0	14	46.7	32	35.6	
	For how long you should wait before the next actuation of the device:	10 seconds	33	55.0	1	53.3	49	
20 seconds	15	25.0	9	30.0	24	26.7		
30 seconds	12	20.0	5	16.7	17	18.9		
Which of the following is true regarding the use of inhaled corticosteroids:	Wash your mouth after each use to prevent thrush	30	50.0	22	73.3	52	57.8	0.012
	To minimize its use due to side effects	9	15.0	7	23.3	16	17.8	
	It can stunt children's growth	18	30.0	1	3.3	19	21.1	
	Inhaled steroids are harmful	3	5.0	0	0.0	3	3.3	
The most important step for correct DPI inhalation is :	Exhale deeply before inhalation	17	28.3	11	36.7	28	31.1	0.487
	Shake the device before inhalation	13	21.7	7	23.3	20	22.2	
	Inhale deeply and forcefully	17	28.3	4	13.3	21	23.3	
	Firing the device after beginning inspiration	9	15.0	4	13.3	13	14.4	
	Continue deep and slow inspiration	4	6.7	4	13.3	8	8.9	
Do you always teach the child's guardian about the use of inhalers?	Only first time	19	31.7	11	36.7	30	33.3	0.438
	In each visit	38	63.3	19	63.3	57	63.3	
	Never	3	5.0	0	0.0	3	3.3	
When is it recommended to wash the spacer with warm water and a detergent:	After each use	24	40.0	14	46.7	38	42.2	0.903
	Once weekly	15	25.0	6	20.0	21	23.3	
	Once monthly	14	23.3	6	20.0	20	22.2	
	Never wash	7	11.7	4	13.3	11	12.2	



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