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SHORT REPORT

Do pediatric healthcare providers know how to use metered dose inhaler plus spacer devices?☆

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Summary We tested whether health practitioners correctly used MDI-spacer devices. Of 122 subjects, 89% had instructed a patient on using a spacer. Whilst performance with the AeroChamber was the best, only 3% correctly demonstrated all the steps for that device.

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Introduction

Over the past several years, there has been a surge in the manufacture of different types of spacer devices for use with metered dose inhalers (MDIs). The mode of use for these devices differs, depending particularly upon the presence or absence of a valved chamber. Pediatric healthcare providers frequently instruct patients on the use of MDI and spacer devices. However, no studies have tested whether or not providers are themselves able to use different spacer devices correctly.

We report on a pilot study to determine whether pediatric health practitioners correctly used the MDI-spacer devices that they prescribe and demonstrate to patients.

Method

We surveyed pediatric attendings, residents and nurses at an inner-city academic medical center in the Bronx. The study was approved by the Institutional Review Board of Montefiore Medical Center. First, subjects were asked whether they had ever prescribed spacer devices, and whether they had ever instructed patients in their use. Then, they were shown a series of commonly used spacer devices: (1) the two-way valve AeroChamber Plus with mask (Monaghan Medical, Plattsburgh, NY); (2) the one-way valve OptiChamber with mouth-piece (HealthScan Products Inc., Cedar

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Table 1 Proportion of pediatric healthcare providers who correctly demonstrated the steps of MDI-spacer use for three spacer devices ($N = 122$).

	Aerochamber Plus ^a	Optihaler ^b	Optichamber ^c
Shakes MDI	67%	3%	33%
Assembles MDI-S correctly	89%	2%	41%
Forms tight seal (for mask)	61%	N/A	N/A
Instructs patient to breathe in	11%	1%	7%
Correct no. breaths/length to hold breath	31%	0%	7%
Waits correct interval/resets for next puff	23%	2%	12%
NO steps correct	7%	97%	59%
ALL steps correct	3%	0%	3%

The criterion standard for correct demonstration was the manufacturers' instructions.

^a two-way valve AeroChamber Plus with mask (Monaghan Medical, Plattsburgh, NY).

^b one way valve OptiChamber with mouth-piece (HealthScan Products Inc., Cedar Grove, NJ).

^c no-valve OptiHaler (HealthScan Products Inc., Cedar Grove, NJ).

Grove, NJ); and (3) the no-valve OptiHaler (HealthScan Products Inc., Cedar Grove, NJ). Subjects were asked to demonstrate how they would instruct a patient to use each device to administer two puffs of albuterol. Using the manufacturers' instructions as the criterion standard, the investigator coded the subject's performance as correct or incorrect.

Results

122 subjects participated in the study (30 generalist attendings, 42 nurses and 50 residents). 100% of the physicians had prescribed an MDI-spacer; of these, 23% write a prescription for "spacer" without specifying a particular brand of spacer. Of those who do specify a brand, 94% prescribe AeroChamber, 3% prescribe the Optihaler, 2% prescribe "other brands" and none prescribe the Optichamber. Overall, 89% of subjects had shown a patient how to use a spacer device. Whilst performance with the Aerochamber was the best, only 3% of subjects

correctly demonstrated all the steps for that device (Table 1).

Conclusion

The National Asthma Education and Prevention Program recommends that health care providers routinely check patients' use of MDI-spacers and correct their technique [1]. In this study, we found that while practitioners often prescribed MDI-spacers and instructed patients on their use, the majority did not know how to use a spacer device themselves. Asthma quality improvement efforts should include formal assessment of practitioner ability to use MDI-spacer devices, and formal instruction to ensure proper technique.

Reference

- [1] National Institutes of Health. Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma. National Institutes of Health, National Heart, Lung, and Blood Institute. Bethesda MD, July 1997; NIH Publication no. 97-4051.

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