Effect of inhaler technique education on acute exacerbation and disease control in patients with asthma and COPD in Sawanpracharak Hospital (Preliminary report)

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Background

Asthma and COPD affect up to 7-19% of the population[1,2]. Inhaled therapy is the most widely used to treat patients with asthma and COPD. There are differences inhaler devices available but up to 80% of them do not use their inhalers correctly[1]. Inhaler technique education may improve clinical outcomes and decrease exacerbation rates in patients with asthma or COPD.

Objectives

We study to evaluate the effect of inhaler technique education with placebo device training on acute exacerbation and disease control and to investigate factors associated with inhaler technique error in patients with asthma and COPD in Sawanpracharak hospital.

Methods

A quasi-experimental study has been conducted from 2018 to 2020 in asthma or COPD patients who have history ≥ 1 severe exacerbation in the previous year. PIFR was measured by using an In-Check DIAL device. The usage of inhaler was assessed step by step from opening to rinsing the mouth after inhaler use. The intervention was performed at baseline, 3, 6 months later for 1-year follow-up. Severe exacerbation and hospitalization from asthma or COPD, ACT, CAT, mMRC, disease control, pulmonary function were recorded. A total 45 participants were estimated as adequate to detect a 50% reduction in exacerbation rates.

Results

Among 29 patients, 18(58.62%) were women, 14 were asthma, 17 were COPD and 4 were ACO. COPD group D were noted in 79% of COPD patients. The median age (IQR) was 60(48-73) years and 16(55.17%) patients age more than 60 year. The frequent exacerbations (≥ 2) in the previous year were observed in 25(86.21%). At baseline, the mean post-BD FEV_1 was 1.73±0.88 L, the mean PIFR was 57.41±22 LPM. There were 26(89.66%) of the patients used inhaler incorrectly. Severe asthma or COPD exacerbation decrease from 4.58±4.34/year to 0.33±1.05/year (p<0.001). The mean hospitalization from asthma or COPD was decrease from 2.46±3.93/year to 0.16±0.48/year (p=0.004) after inhaler technique education. The mean ACT for asthma was increased from 15.75±7.63 to 21.25±3.30 (p=0.09). The mean CAT and mMRC were not significantly decreased for COPD. Knowledge about inhaler use of the patients were also improved after education.

Table 1. Assessment of inhalation technique and baseline characteristics of participants

Inhalation technique, N (%)	
Correct	3(10.34)
Incorrect	26(89.66)
Asthma Control Test (ACT)	16.50(6.09)
The level of control for asthma patients, N (%)	
Controlled	6 (37.50)
Uncontrolled	10 (62.50)
GOLD ABCD assessment for COPD patients, N (%)	
Group A	0
Group B	2(10.53)
Group C	2(10.53)
Group D	15(78.95)
COPD Assessment Test (CAT)	14.44(7.03)
mMRC, mean (SD)	1.28(1.27)
History of severe exacerbation in the previous year, mean (SD)	4.48(4.47)
History of hospitalization from asthma or COPD exacerbation in the previous year, mean (SD)	2.10(3.66)
Post-bronchodilator FEV_1, mean (SD) (L)	1.73(0.88)
Peak Inspiratory Flow Rate, mean (SD) (LPM)	57.41(22.07)
Number of inhaler use, N (%)	
1	12(42.38)
2	6(20.69)
3	11(37.93)
Number of inhaler use ≥ 2	18(62.07)

Table 2. Factors associated with inhaler technique error

	OR	P-value	95% CI
Age ≥ 60	2.72	0.44	0.22-34.01
Duration of disease, year	0.98	0.69	0.92-1.05
Duration of inhaler use, year	1.18	0.70	0.51-2.74
Number of inhalers use ≥2	0.8	0.86	0.06-10.01
Education			
below secondary school	7.5	0.14	0.53-105.28
Type of devices			
MDI	0.8	0.86	0.63-10.01
Accuhaler	0.89	0.92	0.07-11.28
Turbuhaler	2.33	0.51	0.19-29.04
Handihaler	1.25	0.86	0.99-15.65

Conclusions

Inhaler technique education with placebo-device training reduce severe exacerbation and hospitalizations and improve symptom score in asthma and COPD patients in tertiary care setting. However, this research is continuing to complete data for 1-year follow-up and identify factors associated with inhaler technique error in patients with asthma and COPD.

References
1. Global strategy for asthma management and prevention 2018.
2. Global Strategy for Prevention, Diagnosis and Management of Chronic Obstructive Pulmonary Disease 2019.