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Respiratory Medicine

EFFICACY OF SMART(SINGLE MAINTENANCE & RELIEVER THERAPY) IN MANAGEMENT OF ASTHMA

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ABSTRACT **INTRODUCTION:** SMART regimen has shown to be effective in controlling serious asthma exacerbations. Hospitalisations not only indicate poor control bust are also financial burden for the patient. Hence the need for this study that assesses the exacerbations and also need for hospitalizations in asthmatic patients on SMART regimen especially in the Indian setting.

AIM: To assess the efficacy of SMART in management of asthma: Exacerbations & Hospitalizations

METHODOLOGY: Case control study with 172 patients divided into study group and control group with study group receiving SMART regimen and control group receiving only maintenance. Follow up maintained for 5 years. Number of exacerbations and hospitalizations recorded and tabulated. Test for significance applied and conclusions drawn.

RESULTS: Study group had similar number of exacerbating patients and similar number of exacerbations. The number of hospitalizations was far less in study group.

CONCLUSION: SMART therapy results in statistically lesser hospitalizations.

KEYWORDS : Asthma, Smart, Exacerbation, Hospitalization

INTRODUCTION:

Asthmatic patients often require long term inhalational therapy with inhaled corticosteroids alone or in combination with long acting beta agonists depending upon the severity of the disease. The inhalation of corticosteroid coupled with long-acting β_2 agonist (ICS + LABA) from a single inhalation device twice daily has become a valuable strategy[1]. This combination approach reduces exacerbation risk and increases the likelihood of controlling asthma more often, more rapidly and at a lower dose of ICS than Is seen with ICS therapy alone[2-4].

Typically, combination ICS/LABA therapy has been prescribed with a separate rapid-acting β agonist inhaler used for relief of occasional breakthrough symptoms, but combination ICS/LABA formulations employing formoterol as the LABA component allow patients to employ their usual maintenance inhaler for quick relief as well. This strategy of medication use has been recognised by regulatory authorities and in international guidelines[1]. It has recently been argued that a strategy of using single maintenance and reliever therapy (SMART) offers more than convenience to patients; it is said to provide better improvements in several outcomes with lower ICS dosing than the traditional combination therapy approach of constant maintenance dosing with a separate reliever[5-7].

This study aims to test this claim in the Indian set up.

AIM:

To assess the efficacy of SMART in management of asthma: Exacerbations & Hospitalizations.

MATERIALS AND METHODS:

Case control study was done on patients of asthma who were already on ICS + LABA (Formoterol + Budesonide) inhalational therapy by dry powder inhaler.

172 patients were included in the study and 2 groups of 86 each were made. The first group was the study group which received the SMART therapy for asthma with formoterol + budesonide inhalational therapy by dry powder inhaler. The control group was advised DPI Formoterol + Budesonide as maintenance alone.

The groups were followed up for a period of 5 years and observations with regard their exacerbations during the period and the number of exacerbations requiring hospitalization was studied.

Interpretation of the tabulated data was done and conclusions were drawn.

INCLUSION CRITERIA:

1. Diagnosed case of asthma on inhaled Formoterol + Budesonide by dry powder inhaler.

EXCLUSION CRITERIA:

1. Patients not willing to participate in the study.
2. Patients with history of tremors or nervousness and sleeping difficulties were excluded from the study

SAMPLE SIZE:

172 patients in total were included in the study. Out of which 86 were included in the study population and remaining 86 were taken as control in the study.

DATA COLLECTION TECHNIQUE:

Regular 6 monthly follow up visits of both the groups were scheduled for data collection purposes and schedule handed over to patients on the first day of study. Every visit the patient was asked for the occurrence of any exacerbations and how the said exacerbation was managed? The study group was asked to abide by SMART and the

control group was advised to visit the nearest medical healthcare facility in case of an exacerbation.

The data was then tabulated, interpreted and conclusions drawn.

STATISTICAL TEST USED:
Chi Square Test

OBSERVATIONS:
THE DATA OBTAINED FROM PATIENTS WAS TABULATED AS UNDER:
Table 1: Data Collected of Study and Control Groups (Master table)

Group	Patients	Number of patients who exacerbated	Number of exacerbations in follow up period	Hospitalizations required
Study	86	26	32	7
Control	86	22	36	26

The table indicates that the study group (SMART group) had similar number of exacerbating patients and similar number of exacerbations however the number of hospitalizations was far less than the control group.

STATISTICAL ANALYSIS:
APPROPRIATE TEST OF SIGNIFICANCE WAS APPLIED TO THE DATA : CHI SQUARE TEST
Table 2: Statistical Analysis for Exacerbating Patients

Group	Exacerbating Patients	Non exacerbating patients
Study	26	60
Control	22	64
	p value=	0.496520

The above table shows that the SMART group experienced similar number of exacerbations and almost similar number of patients were exacerbating in the follow up period. The difference between the two groups with regard the exacerbations and number of exacerbating patients was found to be statistically insignificant.(p value= 0.496520 i.e. >0.05)

Table 3: Statistical Analysis for Hospitalizations

Group	Hospitalizations required	Hospitalizations not required
Study	7	25
Control	26	10
	p value=	0.000034

The above table demonstrates that the number of hospitalizations required with regard the exacerbation were much lower in the study population (SMART group) as compared to the control group.

The difference in number of hospitalizations was found to be statistically significant. (p value= 0.000034 i.e. <0.05)

This statistical analysis demonstrates that the SMART group had similar prevalence of exacerbations and number of exacerbating patients, however the need for hospitalization was far less. This can mostly be attributed to the early and patient triggered intervention of inhalational ICS + LABA on development of early symptoms or "aura" of exacerbations.

DISCUSSION:
The largest of the early trials was reported by O'Byrne and colleagues[8]. This 1-year trial assigned patients to (1) budesonide/formoterol 100/6 one puff twice daily with terbutaline reliever; (2) budesonide 400 µg twice daily with terbutaline reliever; or (3) budesonide/formoterol 100/6 one puff twice daily with additional doses as reliever. Time to first severe exacerbation was delayed in the SMART group compared with the other regimens. Secondary outcome variables were also better. The investigators suggested the timing of additional ICS therapy in the SMART group as a possible mechanism to explain the better outcomes with SMART versus budesonide monotherapy at mean daily doses of 300 µg versus 400 µg respectively. They did not discuss the improved outcome of SMART versus conventional combination therapy with SABA reliever, but their data showed that patients on SMART averaged 50% higher daily ICS doses than patients using conventional combination therapy. Thus, this trial confirms that increasing the dose of ICS may be helpful in improving asthma outcomes.

A later blinded trial by Rabe and colleagues compared two conventional combination treatment arms with a SMART treatment arm over 12 months[9]. Patients with poorly controlled asthma were randomised to budesonide/formoterol 200/6 (Symbicort 200) one puff twice daily and one of terbutaline 500 µg, formoterol 6 µg or budesonide/formoterol 200/6 as reliever. The time to first severe exacerbation (defined as hospitalisation, emergency department visit or prednisone use) was longest in the SMART arm, shorter in the formoterol reliever arm and shortest in the terbutaline reliever arm. Although several individual symptom outcomes were statistically better in the SMART arm than in the comparator arms, there was no difference among treatments in the asthma control days or the quality of life. The average daily dose of budesonide was increased by 50% in the SMART-treated patients compared with the comparator arms (604 µg vs 400 µg).

In aggregate, these blinded studies showed no clear safety signals for SMART therapy. They confirmed that combination therapy with ICS/LABA produces better asthma outcomes than ICS monotherapy and that higher doses of ICS/LABA combination therapy produces better results than lower doses.

CONCLUSION:
We can thus conclude that SMART therapy places the control of patients' health in scenarios of exacerbations in the patients hand to some extent and results in statistically lesser hospitalizations. The outcome is most probably due to the timely and early administration of the medications for the symptoms that develop during an exacerbation thus preventing further worsening of the clinical condition of the patients.

REFERENCES:

1. Global Initiative for Asthma (GINA). Global strategy for asthma management and prevention. http://www.ginasthma.com
2. Greening AP, Ind PW, Northfield M, et al. Added salmeterol versus higher-dose corticosteroid in asthma patients with symptoms on existing inhaled corticosteroid. Lancet 1994;344:219–24.
3. Pauwels RA, Lofdahl CG, Postma DS, et al.; Formoterol and Corticosteroids Establishing Therapy (FACET) International Study Group. Effect of inhaled formoterol and budesonide on exacerbations of asthma. N Engl J Med 1997;337:1405–11.
4. Bateman ED, Boushey HA, Bousquet J, et al. Can guideline-defined asthma control be achieved? The Gaining Optimal Asthma Control study. Am J Respir Crit Care Med 2004;170:836–44.
5. Selroos O . A smarter way to manage asthma with a combination of a long-acting beta(2)-agonist and inhaled corticosteroid. Ther Clin Risk Manag 2007;3:349–59.
6. Barnes PJ. Using a combination inhaler (budesonide plus formoterol) as rescue therapy improves asthma control. BMJ 2007;335:513.
7. Humbert M, Andersson TL, Buhl R. Budesonide/formoterol for maintenance and reliever therapy in the management of moderate to severe asthma. Allergy 2008;63:1567–80.
8. O'Byrne PM, Bisgaard H, Godard PP, et al. Budesonide/formoterol combination therapy as both maintenance and reliever medication in asthma. Am J Respir Crit Care Med 2005;171:129–36.
9. Rabe KF, Atienza T, Magyar P, et al. Effect of budesonide in combination with formoterol for reliever therapy in asthma exacerbations: a randomised controlled, double-blind study. Lancet 2006;368:744–53.