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Original Article

Assessment of Asthmatic Patients Treated with Salbutamol: A Hospital Based Study

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***ABSTRACT*:**

Background: Asthma is a common long-term inflammatory disease of the airways of the lungs. It is characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Sympathomimetic beta-2 agonists are the main stay of therapy of acute bronchial asthma. The present study was conducted to assess the asthmatic patients treated with salbutamol. **Materials & Methods:** The present study was conducted on 110 asthmatic patients of both genders. All were prescribed salbutamol for the period of 2 months and all patients were recalled and parameters such as symptoms, side effects were recorded. **Results:** Out of 110 patients, males were 60 and females were 50. The difference was non- significant (P- 1). Common symptoms were wheezing (105) followed by chest tightness (100), coughing (95) and shortness of breath (78). The difference was non- significant (P> 0.05). 13 patients had dizziness, 10 had migraine headache and 8 had high blood pressure with salbutamol. The difference was significant (P< 0.05). **Conclusion:** Asthma is a common bronchial disease affecting significant amount of population. Salbutamol is commonly employed drug found affective in most of the cases.

Key words: Asthma, Bronchospasm, Salbutamol.

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INTRODUCTION:

Asthma is a common long-term inflammatory disease of the airways of the lungs. It is characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Symptoms include episodes of wheezing, coughing, chest tightness, and shortness of breath. These episodes may occur a few times a day or a few times per week. Depending on the person, they may become worse at night or with exercise.[1] Asthma is thought to be caused by a combination of genetic and environmental factors. Environmental factors include exposure to air pollution and allergens. Other potential triggers include medications such as aspirin and beta blockers. Diagnosis is usually based on the pattern of symptoms, response to therapy over time, and spirometry. Asthma is classified according to the frequency of symptoms, forced expiratory volume in one second (FEV1), and peak expiratory flow rate. It may also be classified as atopic or non-atopic, where atopy refers to a predisposition toward developing a type 1 hypersensitivity reaction.[2]

Sympathomimetic beta-2 agonists are the main stay of therapy of acute bronchial asthma. Even with aggressive approach with additional doses of salbutamol, significant airway obstruction remains in most of the cases of acute asthma. This suggests that the residual airway obstruction is related to factors unresponsive to beta-2 agonist bronchodilators, such as mucosal edema, secretions or cholinergic bronchomotor tone.[3] Although acute bronchial asthma exacerbations are associated with increased vagal tone, suggesting a rationale for the use of anticholinergics, the results of clinical trials of anticholinergics have been contradictory. While some studies have found inhaled anticholinergics to be effective bronchodilators in acute asthma others have reported no additional benefit when they are combined with beta adrenergic agonists. Studies that do not report a statistically significant beneficial effect, nevertheless consistantly show that patients receiving combination treatment have slightly

better response than patients receiving only beta-2 agonists.[4] The present study was conducted to assess the asthmatic patients treated with salbutamol.

MATERIALS & METHODS

We planned the present study in the department of pharmacology of M.G. Hospital, Bhilwara, Rajasthan. The present study was conducted on 110 asthmatic patients of both genders. All were prescribed salbutamol for the period of 2 months and all patients were recalled and informed regarding the study and written consent was taken. Ethical clearance was taken prior to the study. Exclusion criteria for the present study included:

- Patients with history of any systemic illness,
- Patients with any known drug allergy,
- Patients with history of any other respiratory pathology,
- Patients on immunosuppressant drug therapy

General information such as name, age, gender etc. was recorded. Parameters such as symptoms, side effects were recorded. Results thus obtained were subjected to statistical analysis. All the results were analyzed by SPSS software. Student t test was used for evaluation of level of significance. P value less than 0.05 was considered significant.

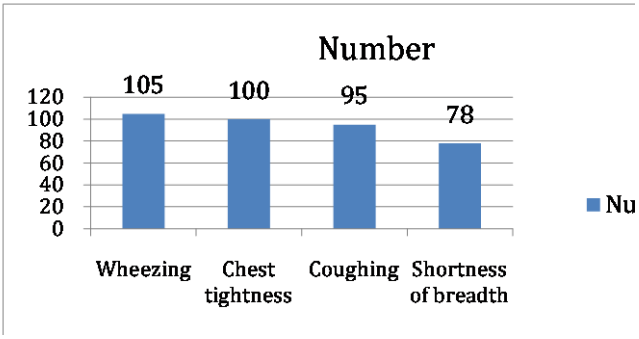
RESULTS

Table I shows that out of 110 patients, males were 60 and females were 50. The difference was non- significant (P-1). Graph I shows that common symptoms were wheezing (105) followed by chest tightness (100), coughing (95) and shortness of breath (78). The difference was non-significant (P> 0.05). Graph II shows that 13 patients had dizziness, 10 had migraine headache and 8 had high blood pressure with salbutamol. The difference was significant (P< 0.05).

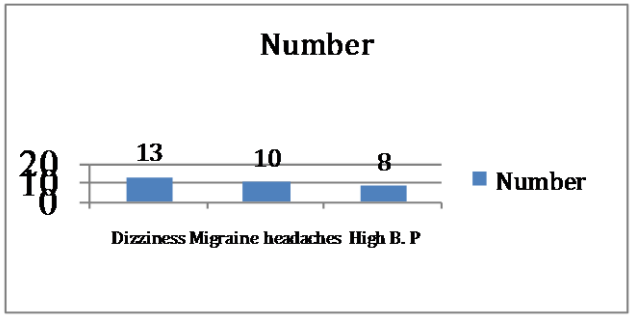
Table 1: Distribution of subjects

Total subjects		110
Gender	Males	60
	Females	50
Mean age (years)		43.1
Mean weight (Kg)		63.4

Graph I: Symptoms in patients



Graph II: Side effects of salbutamol



DISCUSSION

Salbutamol is used in moderate-to-severe persistent asthma following previous treatment with a short-acting β_2 adrenoreceptor agonist (SABA). LABAs should not be used as a monotherapy, instead, they should be used concurrently with an inhaled corticosteroid, such as beclometasone dipropionate or fluticasone propionate in the treatment of asthma to minimize serious reactions such as asthma-related deaths. In chronic obstructive pulmonary disease (COPD), LABAs may be used as monotherapy or in combination with corticosteroids.[5]

In present study, out of 110 patients, males were 60 and females were 50. This is in agreement with Sharma et al.[6] In exercise-induced bronchospasm monotherapy may be indicated in patients without persistent asthma. LABAs should not be used to treat acute symptoms. Short-acting anticholinergic agents have also been studied. We found that common symptoms were wheezing (105) followed by chest tightness (100), coughing (95) and shortness of breath (78). 13 patients had dizziness, 10 had migraine headache and 8 had high blood pressure with salbutamol. This is in agreement with Mittal et al.[7]

In double-blind study by Ajay et al[8], patients who had been diagnosed with asthma for ≥1 year were randomized to two sequences of study medication "as needed" for symptom relief (1–7 day washout before second 4-week treatment period): CVT-MDI/ALB-HFA or ALB-HFA/CVT-MDI. On days 1 and 29 of each sequence, 6-hour serial spirometry was performed after administration of the study drug. Co-primary endpoints were FEV1 area under the curve and peak forced expiratory volume in 1 s (FEV1) response (change from test day baseline) after 4 weeks. A total of 226 patients, ≥18 years old, with inadequately controlled, moderate-to-severe asthma were randomized. The study met both co-primary endpoints demonstrating a statistically significant treatment benefit of CVT-MDI versus ALB-HFA. FEV1 AUC0-6h response was 167 ml for ALB-HFA, 252 ml for CVT-MDI (p <0.0001); peak FEV1 response was 357 ml for ALB-HFA, 434 ml for CVT-MDI (p <0.0001). Adverse events were comparable across groups. Author concluded that CVT-MDI significantly improved acute bronchodilation over ALB-HFA alone after 4 weeks of "as-needed" use for symptom

relief, with a similar safety profile. This suggests additive bronchodilator effects of β2-agonist and anticholinergic treatment in moderate-to-severe, symptomatic asthma. Lavorini F et al evaluated changes in airway patency, lung volumes and perception of breathing discomfort intensity following salbutamol administration via the Diskus dry-powder inhaler (DPI) or a pressurized metered-dose inhaler with the Volumatic valved holding chamber (pMDI +Volumatic) in asthmatic patients with methacholine-induced bronchoconstriction. On six different study days, 18 patients inhaled methacholine until forced expiratory volume in 1 s (FEV1) decreased by approximately 35% of baseline. Following placebo, 200 and 400 µg of salbutamol through the pMDI +Volumatic or the Diskus, changes in FEV1, volume-adjusted mean forced expiratory flow from 25 to 75% of the forced vital capacity (isoFEF25−75), lung volumes and breathing discomfort intensity, assessed by visual analogue scale (VAS) score, were repeatedly measured over a 60-min observation period. Induced bronchoconstriction was accompanied by obvious reductions in lung volumes and increases in VAS score. After salbutamol administration, FEV1 and VAS score changes were similar in all experimental conditions. However, following 400 µg salbutamol via pMDI +Volumatic, isoFEF25−75 values increased up to 4.48 l s−1 (95% confidence interval 4.06, 4.90), a significantly ($P < 0.01$) higher value than those attained in all other experimental conditions. Independently of the salbutamol dose, lung volumes rose to significantly ($P < 0.01$) higher levels in pMDI +Volumatic than in Diskus trials. The low salbutamol dose via the pMDI +Volumatic and the high dose via the DPI increased isoFEF25−75 and lung volumes to similar extents. Salbutamol via the pMDI +Volumatic provides greater isoFEF25−75 and lung volume increases in asthmatic patients with induced bronchoconstriction; salbutamol-induced changes in VAS scores poorly reflect those in small airway patency.[9]

Lavorini F et al evaluated the speed of onset of bronchodilation following salbutamol administered via a metered-dose inhaler with a spacer (pMDI + Volumatic) and a dry-powder inhaler (Diskus), as well as the relative potencies of these devices in asthmatic patients with methacholine-induced bronchoconstriction. Eighteen patients inhaled methacholine (MCh) until FEV(1) decreased by 35% of control. Following administration of placebo, 200 microg salbutamol or 400 microg salbutamol through the pMDI + Volumatic or the Diskus, we calculated the time elapsed from drug administration and the appearance of a 90% increase in post-MCh forced vital capacity (FVC), FEV(1) and volume-adjusted mid-expiratory flow (recovery times). The salbutamol doses to be delivered by the two inhalation devices to achieve similar recovery times and the relative potencies of the devices were calculated by using the 2-by-2 Finney parallel regression method.

For all functional variables, recovery times were significantly ($P < 0.01$) shorter in pMDI + Volumatic than Diskus trials. The salbutamol doses to be delivered by the Diskus to achieve recovery times for FVC, FEV(1) and volume-adjusted mid-expiratory flow similar to those obtained with 200 microg salbutamol administered via the pMDI + Volumatic were 558 (95% CI 537, 579) microg, 395 (95% CI 388, 404) microg and 404 (95% CI 393, 415) microg, respectively, and corresponded to relative potencies of 2.79 (95% CI 2.68, 2.90), 1.98 (95% CI 1.94, 2.02), and 2.02 (95% CI 1.96, 2.07). Administration of salbutamol via the pMDI + Volumatic provides faster reversal of induced bronchoconstriction than via the Diskus.[10]

CONCLUSION

From the above results, the authors conclude that asthma is a common bronchial disease affecting significant amount of population. Salbutamol is commonly employed drug found affective in most of the cases.

REFERENCES

1. Peters SP, Kunselman SJ, Icitovic N, Moore WC, Pascual R, Ameredes BT, et al. Tiotropium bromide step-up therapy for adults with uncontrolled asthma. N Engl J Med. 2010;363(18):1715–26.
2. American Thoracic Society. ATS standardization of spirometry. 1994 update. Am J Resp Crit Care Med. 1994;152:1107–36.
3. Miller MR, Hankinson J, Brusasco V, Burgos F, Casaburi R, Coates A, et al. Standardisation of spirometry. Eur Respir J. 2005;26(2):319–38.
4. Hankinson JL, Odencrantz JR, Fedan KB. Spirometric reference values from a sample of the general U.S. population. Am J Respir Crit Care Med. 1999;159(1):179–87.
5. Juniper EF, Buist AS, Cox FM, Ferrie PJ, King DR. Validation of a standardized version of the Asthma Quality of Life Questionnaire. Chest 1999;115(5):1265–70.
6. Sharma, et al. Tiotropium improves lung function in patients with severe uncontrolled asthma: a randomized controlled trial. J Allergy Clin Immunol 2011;128(2):308–14.
7. Mittal et al. Tiotropium in asthma poorly controlled with standard combination therapy. N Engl J Med 2012;367(13):1198–207.
8. Ajay et al. Tiotropium is noninferior to salbutamol in maintaining improved lung function in B16-Arg/Arg patients with asthma. J Allergy Clin Immunol 2011;128(2):315–22.
9. Lavorini F, Geri P, Luperini M, et al. Clinical and functional responses to salbutamol inhaled via different devices in asthmatic patients with induced bronchoconstriction. British Journal of Clinical Pharmacology. 2004;58(5):512-520.
10. Lavorini F1, Geri P, Mariani L, Marmai C, Maluccio NM, Pistolesi M, Fontana GA. Speed of onset of bronchodilator response to salbutamol inhaled via different devices in asthmatics: a bioassay based on functional antagonism. Br J Clin Pharmacol. 2006 Oct;62(4):403-11.

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