

PROSPECTIVE STUDY ON ROLE OF INHALERS AND ASTHMA EDUCATION IN PREVENTION OF REPEATED EMERGENCY VISITS

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ABSTRACT

Aim: This study aims at assessing the role of inhalers and asthma education in prevention of repeated emergency visits. **Methods:** It is a prospective observational study done for six months. Data was gathered on the basis of questionnaire and interview. Descriptive statistical analysis was performed to analyze the results. **Results and discussion:** Among 160 subjects 87(54.375%) were knowledgeable & 73(45.625%) were not knowledgeable before providing patient education. After educating to the not knowledgeable group (73) the same questionnaire was re administered and 46(28.75%) patients were found to be knowledgeable. 98(61.25%) & 62(38.75%) were in improper inhaler use before providing patient education ($p < 0.0001$). After educating the improper inhaler use group 62(38.75) 47(29.375%) patients were found to be using their inhaler correctly ($p < 0.0001$) and also assessed the number emergency visits before and after education and after intervention were 98 that states

Article Received on
16 Oct 2015,

Revised on 06 Nov 2015,
Accepted on 26 Nov 2015

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the reduction in emergency visits was reduced by 38%. **Conclusion:** Poor knowledge and improper asthma inhaler device use are associated with poor asthma control and more frequent Emergency Department (ED) visits. We also identified characteristic factors leading patients to visit the ED.

KEYWORDS: Asthma education, Inhaler technique, Inhaler devices, Emergency Department visits.

INTRODUCTION

Asthma is a common disease worldwide with significant ethnic and regional variations. An increasing morbidity and mortality, as well as health care burden from asthma have been recognized lately.^[1] Drug inhalation is an important and a common mode of administration of drugs used in the management of Asthma and other obstructive airway diseases. These medications are often administered as pressurized metered dose inhalers (pMDI), dry powder inhalers (DPI), or with nebulizers. The pressurized metered dose and the DPI devices are the preferred pulmonary drugs delivery methods as the patients are able to use them on their own with minimal assistance if they are taught well.^[2] Patient education is becoming an essential area of service provision, with our increasing population of people with chronic diseases and conditions requiring long-term management in the community. A large number of patients still experience a high level of morbidity. Much of the morbidity from asthma is believed to be due to factors such as denial of having a chronic condition, poor knowledge of the disease process and medication use, poor understanding on the use of inhalers and poor self-management.^[3]

Many patients have difficulties with inhalers. More than 75% of patients with asthma experience difficulty using metered dose inhalers shows that patients may not maintain a proper technique over time. The inhalation technique should therefore be assessed, reviewed, and verified on a periodic basis to ensure appropriate drug delivery and subsequent efficacy.^[4]

A large proportion of patients prescribed inhaled medications do not use their inhalers correctly. Overall, up to 90% of Patients show incorrect technique in clinical studies with either standard pressurized metered dose inhalers (pMDIs) or dry-powder inhalers (DPIs) such as although these newer inhalers were designed to improve ease of use, significant rates of incorrect use among patients with asthma have been reported for all currently used inhaler

designs, even among regular adult users. With all inhaler types, error rates increase with age and the severity of airflow obstruction. Even after trainings provided, some patients will continue to have difficulties using inhalers properly.^[5]

Many papers have reported that the technique of inhaling medicines in patients with lung diseases is inadequate, with the percentage of patients inhaling effectively ranging 10±85%. Various aspects of inhalation technique have been investigated, from the influence of the type of inhaler to that of patient characteristics such as age, sex, educational level and diagnosing the number of errors made. The majority of patients are educated on correct inhaler technique by physicians or nurses and to lesser extent pharmacists. Inhaler technique is also dependent on repeated education, as inhaler technique may deteriorate after initial education. Confusion among health professionals over who should take responsibility for patient education may result in people not receiving follow-up education on the correct use of their inhalers, contributing to the high rates of poor technique reported.^[6]

A large body of evidence from randomized clinical trials has shown that Patient's inhaler technique can be improved by education from a health professional or other person trained in correct technique. The amount of instruction on inhaler technique given by health care professional's influences the Patient's likelihood of correct technique.

AIM

This study aims at assessing the role of inhalers and asthma education in prevention of repeated emergency visits.

OBJECTIVES

- To educate asthma patients about the role of Inhalers.
- To evaluate the inhaler technique among asthmatic patients.
- To investigate the characteristics of these patients and factors associated with knowledge of disease and improper use of inhaler devices.
- To evaluate on knowledge of asthma.

METHODS

Study design

It is a prospective observational study.

Study period

The present study was carried out for a period of 6 months from October 2014 to March 2015.

Study site

The present study was conducted at the Janaki Ram chest hospital at the outpatient department, Rajampet, Kadapa.

Source of data

All the data collected in the previously designed data collection form. The data required for the cross-sectional study was collected on a daily basis for six months. Questionnaires were used to assess the level of knowledge about the disease and inhaler technique.

Sample size

The total sample size was 160.

Inclusion criteria

- The study included patients of either sex suffering with bronchial asthma & who had at least two physician follow-up visits for asthma as diagnosed by physician.

Exclusion criteria

- Status asthmatic patients.
- Patients who were not prescribed with inhalers.
- Patients with COPD.

Method of data collection

Data collection was done by using the following documents.

Annexure 1- Knowledge of disease process and medications- Mc Nemar Test Knowledge was assessed for asthmatics about disease by using Mc Nemar test.

Annexure 2 -Steps for using your inhaler.

Knowledge was assessed for asthmatics about their inhaler using based on 7 step questionnaire form.

Annexure 3 -Asthma management for every visit at hospital facility.

Statistical analysis

All the data collected was entered into Microsoft Excel spreadsheet. Descriptive statistics were used to analyze the data.

In order to assess the data the significance of knowledge before asthma education and after asthma education Fisher exact chi square test was used.

RESULTS

In the present study, we had assessed 160 Patient’s knowledge of disease & inhaler technique and classified those to not knowledgeable group, according Mc-Nemar test and seven steps inhaler technique questionnaire.

Graph representing the knowledge and inhaler technique in the total sample:

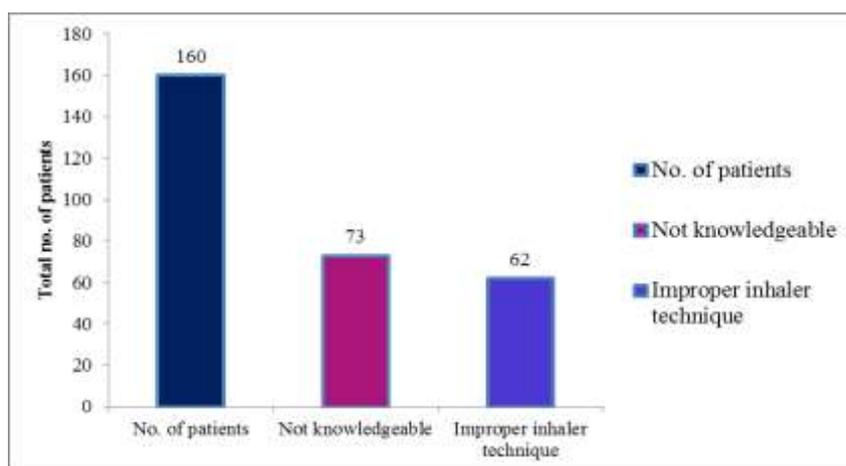


Fig.no.1 Graph representing the knowledge and inhaler technique in the total sample.

In our study 160 subjects and classified those to not knowledgeable group, according Mc-Nemar test was 73 (45.625%). We also assessed their seven step inhaler techniques and categorized to improper inhaler technique group (38.75%).

Table no: 1 Data based on Mc Nemar test.

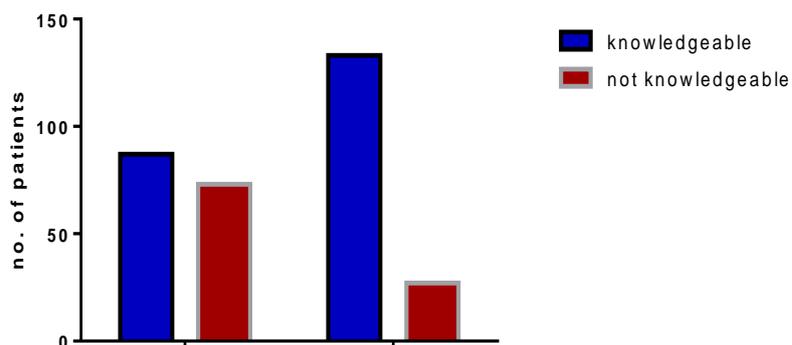
Pre Interventional Data

Not knowledgeable	Knowledgeable
73	87

Post Interventional Data

Not knowledgeable	Knowledgeable
27	133

Graph on knowledge assessment comparing between pre and post interventions



Pre intervention Post Intervention P <0.0001.

Fig no: 2 Graph on a knowledge assessment comparing between pre and post interventions.

In order to assess the patient knowledge about asthma Mc Nemar test was employed and categorized them by using a Likert scale as knowledgeable & not knowledgeable. Among 160 subjects who met the inclusion criteria, 87(54.375%) were knowledgeable & 73(45.625%) were not knowledgeable before providing patient education.

After providing education to the not knowledgeable group (73) the same questionnaire was re administered and 46(28.75%) patients were found to be knowledgeable. However 27(16.875%) did not show significant improvement in their knowledge. There was significant (p<0.0001) difference in knowledge of the respondents before and after education which was calculated by chi square fisher exact test.

Table no: 2 Data based on 7 step inhaler technique questionnaires.

Pre Interventional data

Improper technique	Proper technique
62	98

Post interventional data

Improper technique	Proper technique
15	145

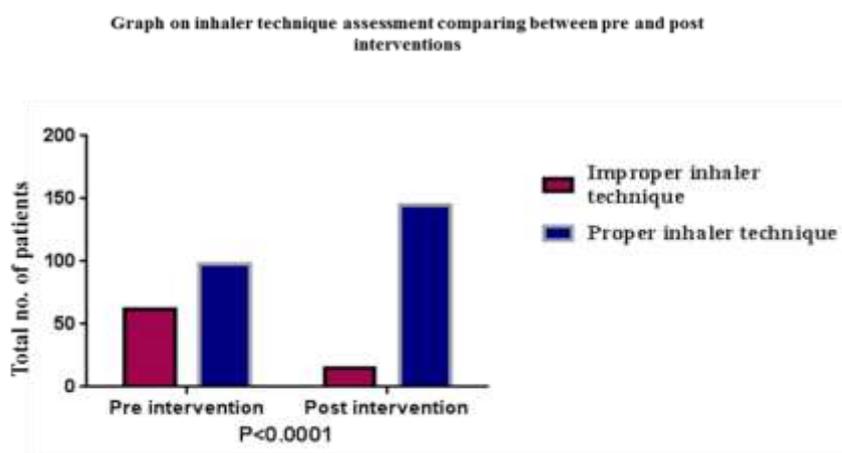


Fig no: 3 Graph on inhaler technique comparing between pre and post interventions.

In order to assess the patient inhaler technique 7 step inhaler technique questionnaire was designed and categorized them based on scoring as proper inhaler technique & improper inhaler technique. Among 160 subjects who met the inclusion criteria, 98(61.25%) & 62(38.75%) were with improper inhaler use before providing patient education.

After providing education to the improper inhaler use group 62(38.75) the same questionnaire was re administered and 47(29.375%) patients were found to be using their inhaler correctly. However 15(9.375%) did not show significant improvement in their inhaler use. There was significant ($p < 0.0001$) difference in knowledge of the respondents before and after education which was calculated by chi square fisher exact test.

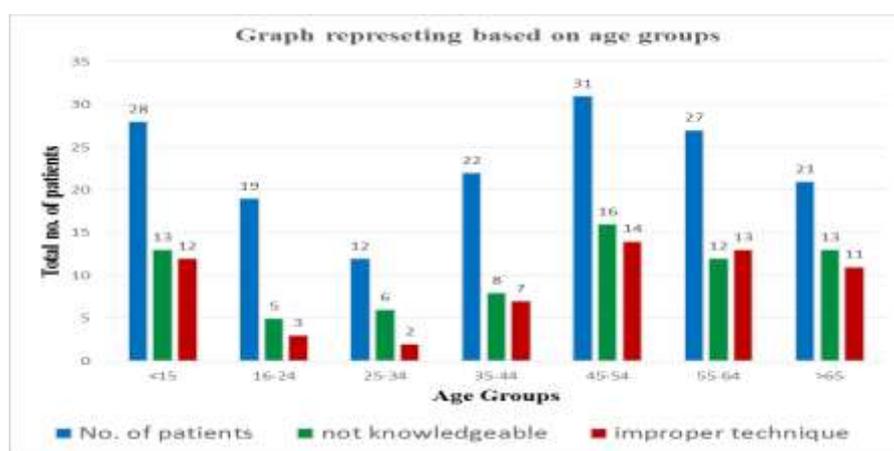


Fig. no: 4 Graph representing based on age group.

We have categorized all the participants into different age groups as shown in the graph. The most commonly affected age group with asthma were 44-55 which accounts for 19% of the total population and least commonly affected were 25-35 (11.87%).

People in the age group of 45-54 (21.91%) were having less knowledge & improper inhaler technique (22.58%) when compared with other groups.

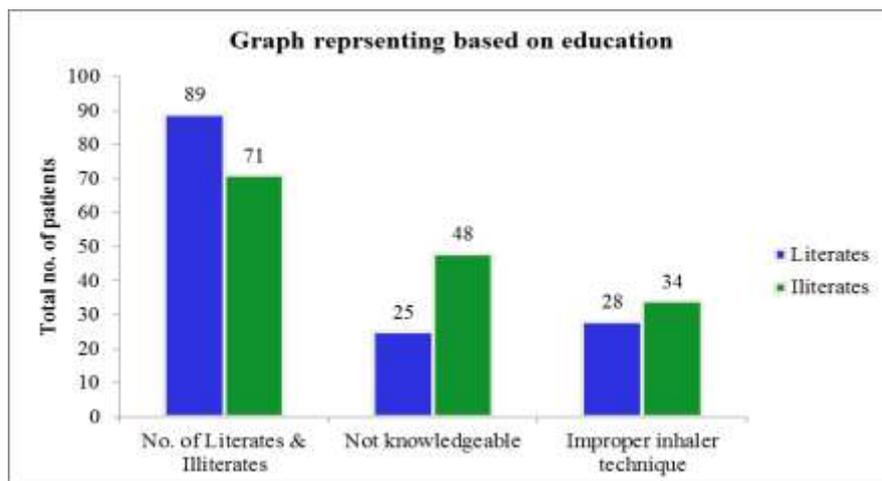


Fig. no: 5 Graph representing based on education.

All the participants were classified into two groups based on literacy. All the people who were able to read and write were treated as literates and others as illiterates.

In the present study, 44.375% of people were illiterates. Illiteracy was one of the characteristic features that have to lead to lack of knowledge and improper inhaler technique.

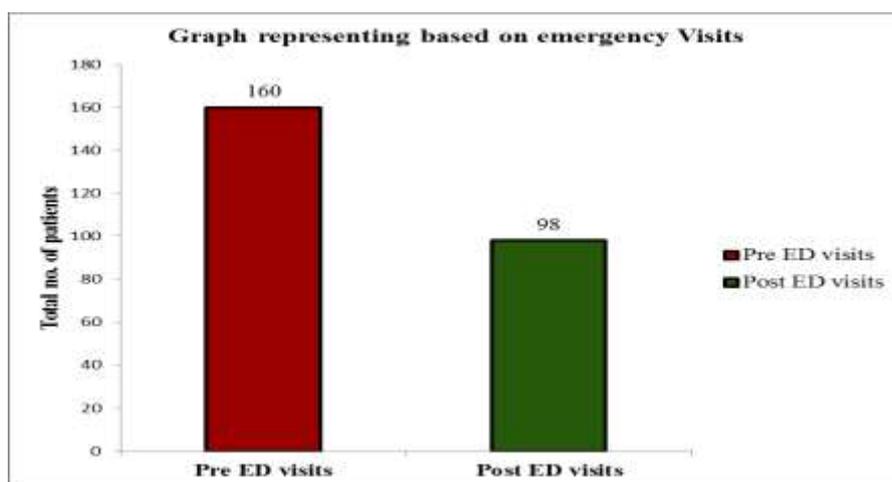


Fig no: 6 Graph representing based on emergency visits.

We also assessed the number emergency visits due to exacerbation of asthma before education and after education were 160 and after intervention were 98 that states the reduction in emergency visits was reduced by 38%.

DISCUSSION OF RESULTS

Asthma education and proper use of inhaler technique are the most important for asthma patients to control the disease. Many of the previous studies shown that the improper use of the inhalers decrease the drug delivery, patient adherence and exacerbation of the asthma symptoms that contributes the uncontrolled asthma and multiple ED visits.^[7] In this study, we tried to identify the relationship between knowledge of disease and improper device use asthma control and number of ED visits. In this study, we provided knowledge of disease and demonstrated the standard inhaler technique. Further, we demonstrated the improper inhaler technique device is associated with poor asthma control and frequent ED visits.^[8-9] We noticed that improper inhaler use is main due to lack of knowledge of the disease.

In this study, a majority of patients were using MDI (39%) however; this should not be accepted as a cause improper inhaler use in fact DPIs are not associated with an improved inhalation technique. Devices should be selected based on a patient's acceptance and preferences.^[10] However, studies have shown that good educational practice results in the proper use of MDI which will be more cost effective in the long-term.^[10-11-12]

In our study total out of 160 asthmatics 73(45.625%) and 62(38.75%) patients had no knowledge of disease and knowledge regarding the proper use of inhaler devices respectively. The improper use of the inhalers is associated with the irregular clinical visits, lack of asthma education regarding the proper use of their inhalers. Therefore, we established asthma education programs to educate patients on asthma and its management and the use of inhaler devices to patients and their caretakers.

In this study 87(54.375%) people showed knowledge on disease and this was improved to 133(83.125%) with a significance of $p < 0.0001$ and 98(61.25%) patients used their inhaler correctly and this is improved to 145(90.625%) with a significance of $p < 0.0001$ regardless the inhaler being used and 38.75% of ED visits were reduced. So providing the proper education on disease and inhaler technique to the asthma patients can show the significant improvement in controlling symptoms, reduces the repeated number of clinical visits.

CONCLUSION

This study shows that poor knowledge of disease and improper inhaler technique is common among patients, which is associated with frequent ED visits. The findings of the study suggest that well-structured asthma education reinforcement with doctors, clinical pharmacist

and other health care providers during routine outpatient visits, is sufficient in achieving effective clinical outcome.

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