

Reasons for Recurrent Admission of Patients with Asthma in District General Hospital Embilipitiya

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1 INTRODUCTION

Asthma is a chronic inflammatory disease of the airways associated with bronchial hyper responsiveness and reversible airflow obstruction (Turner *et al.*, 2011) characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person (Bousquet *et al.*, 2010). It is considered to be one of the world's commonest non-communicable diseases (Bousquet *et al.*, 2010). The fundamental causes of asthma are not completely understood. The strongest risk factors for developing asthma are a combination of genetic predisposition with environmental exposure to inhaled substances and particles that may provoke allergic reactions or irritate the airways (Akdis *et al.*, 2006).

The incidence and prevalence of asthma have increased during the past twenty years, affecting 5-10% of global population (Guptha and Weiss, 2007). World Health Organization (WHO) in 2007 estimates 235 million people suffered and recurrently admitted to the hospital due to asthma recurrent attacks. According to the Global Asthma Report in 2014, most people (80%) affected are in low-an-middle-income countries, and its prevalence is estimated to be increasing fastest in those countries compared to the

developed countries. Poor asthma control remains a frequent cause of emergency department (ED) presentation and hospital admission (Adams *et al.*, 2000) though the patient on the medication for particular clinical incidence. Improper use of inhaled devices in the management of bronchial asthma (Adams *et al.*, 2000) and factors such as variation in exposure to tobacco smoke and other allergens affect to the recurrent hospital admission of asthmatic patients (Woolcock, and Peat, 1997) in most of the countries.

Asthma is burden disease condition which has to be allocated high cost for conducting control programme and as well as treatment due to re admission to hospitals. The Sri Lankan Government is reported to have allocated Rs. 140 million for asthma treatment in the year 2015 alone. The GAN (Global Asthma Network) has marked Sri Lanka as one of the high prevalence countries of asthma and Sri Lanka was also listed as one of the countries with no national strategy plan for managing asthma in 2014. Therefore it is very important to identify the factors related to recurrent admissions of asthma patients in Sri Lanka for an effective control of asthma. There are no significant amount of researches done to identify the factors related to recurrent hospital admissions in asthmatic patients and even



the available research also focused on pediatric population which is not evaluate the adults perception. Therefore this study was aimed to examine reasons for recurrent admission of patients with asthma in District General Hospital Embilipitiya.

2 METHODOLOGY

Quantitative, descriptive and cross-sectional study design was utilized in this study. The study was carried out in medical wards in District General Hospital Embilipitiya, Sri Lanka.

Sample size was calculated using online sample size calculator, Raosoft® considering 95% confident interval and 5% margin of error. Convenience sampling method was carried out and 150 asthmatic patients between 18 to 80 years with more than two times admission within a period of six months, solely due to exacerbation of asthmatic condition were selected. Asthmatic patients who were admitted only once and exacerbation of asthma due to other medical conditions were excluded. Self-administered questionnaire and participant demonstration on inhalation technique were used to collect data. Questionnaire was prepared by reviewing literature and with self-experiences of the investigators. Questionnaire was validated by expert panel. Inhalation technique was evaluated according to the check list developed by referring standard checklist of use of inhalation devices in National Asthma Council Australia and American Pharmacists Association - Academy of Pharmacy Practice and Management (APhA-APPM). Evaluation was done by the investigators. Data was analysed descriptively by using the Microsoft excel software.

Ethical approval was obtained from the Ethics Review Committee of National Hospital of Sri Lanka and permission was obtained from the Medical

Superintendent, District General Hospital Embilipitiya. Informed written consent was obtained from all the participants prior to study. The results were kept strictly confidential by the investigators and each participant was identified only by a random number allocated at the beginning of the study.

3 RESULTS AND DISCUSSION

Respond rate of this study is 96% as 144 usable study instruments were returned from the expected value of 150. According to the socio-demographic background, most of the study participants (60%) were in the age group of 61-80 years. There were more female (67%) than males (33%) and 65% were married. All the participants are Sinhalese and only 23% of the participants have undergone the secondary education (Table 1).

Table 1: Demographic Characters

Description	Quantity	Percentage
Gender		
Male	50	33%
Female	100	67%
Age		
18-40yrs	25	17%
41-60yrs	35	23%
61-80yrs	90	60%
Ethnicity		
Sinhala	150	100%
Religion		
Buddhist	145	97%
Christian	5	3%
Marital status		
Single	30	20%
Married	98	65%
Divorced	6	4%
Widow	16	11%
Education Level		
No formal education	12	13%
Up to Grade 5	7	30%
Grade 6- GCE O/L	34	10%
UP TO GCE A/L	36	13%
Marital status		
Single	30	20%
Married	98	65%
Divorced	6	4%
Widow	16	11%



3.1 Practices of asthmatic patients

According to the results, the majority of the study participants (80%) were unaware of the inhalation device that they use. The majority (60%) were unable to distinguish and identify the difference between Metered Dose Device (MDI) and Dry Powder Inhaler (DPI). Further Majority of the participants (90%) were unable to identify the colour codes of the MDI which were separated for symptom relievers and for symptom preventers. This would affect to effective delivery of the inhalation therapy due to the scare in knowledge regarding the inhalation devices.

Eighty five percent of asthmatic patients had errors in inhalation technique, especially in the use of MDI (Figure 1). The most frequent errors observed in the inhalation technique were poor coordination between actuating the medication and inhalation where observed in 91% of the participants. Further 86% of participants were not hold the breath after inspiration and only 2% holed breathe for 5-10 seconds. The majority (93%) did not used proper positioning for effective inhalation technique. These factors directly contribute to the ineffective drug delivery through the inhalation route where patient on the under dose and which trigger the recurrent hospital presentation in the case of environmental change or exposure to an allergen. Similar results was found in the research conducted in Saudi Arabia where improper use of inhaler devices, lack of education about asthma disease or a lack of regular clinic follow up were led to recurrent admissions (Hamdan *et al.*, 2013).

The majority (90%) were using the MDI with spacer device. Of 40% participants not considered the cleaning of the spacer device and 45% were not clean the spacer device since started using the device. Most of the inhaler users (71%) unaware of the

proper cleaning of the spacer device where they were using dry cloths. This can result in electrostatic charge on the inside of the spacer, which make the medication and dust stick to the sides which result in in unwanted side effects and inadequate drug delivery due to blockage in device. Not only the spacer devices, 90% of the participants were not cleaned the MDI while using and also showed inappropriate technique.

Unawareness of the spacer device technique lead to withdrawal of the use of spacer device combination with MDI in 25% of the asthmatic patient though they have recommended to use spacer device. This made difficulty and complication in use of inhalation device among those patients. These results emphasized the importance of advance education for patients regarding proper usage of inhaler and correct inhalation technique prior to use. Further timely evaluation of the proper usage of inhalation device by the health professionals would help to minimize the recurrent admission of the asthmatic patients to the hospital.

Apart from the inhalation technique errors, practice of smoking also contribute to the recurrent hospital admission in the study participants (Figure 1). There were 44% cigarette smokers among the participated male patients. 72% of cigarette smokers had increased their disease condition and reported hospital admission as similar with the study by Sama *et al.*, 2015.

In addition to above major factors, some of the personal practices also affected to the exacerbation of the asthmatic condition and hospital admission. There were 60% of participants had practicing of bathing at night, 65% of the participants consumed cooled foods and beverages and 75% had pets (Figure 2). These caused to recurrent admission to the hospital as the unawareness of the risk factors of the asthma.

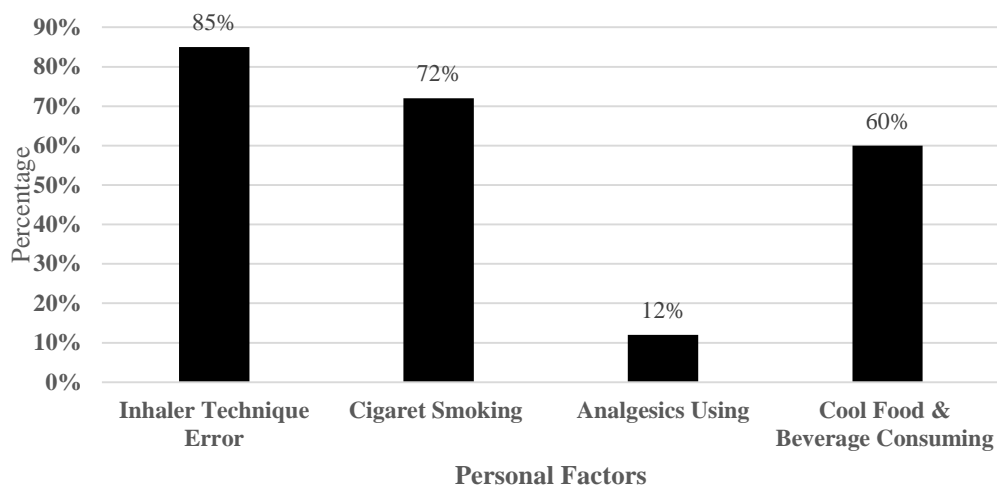


Figure 1- Practices of the asthmatic patients

3.2 Environmental factors

Environmental factors like climate changes also caused to the hospital admission due to the asthma as the season changes may increase cold humidity. And also dust and particle generated due to the agricultural environment (65%) and pest

handling (75%) also contributed to the recurrent hospital admission due the exacerbation of asthma (Figure 2). Similar reasons has been showed in the study conducted by D'Amato, 2011.

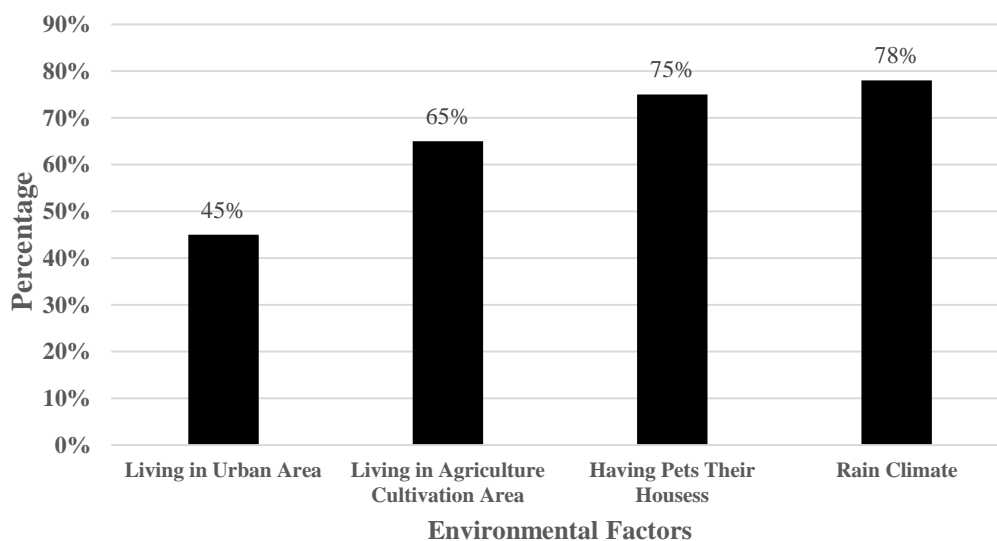


Figure 2- Environmental factors of the asthmatic patients



4 CONCLUSIONS AND RECOMMENDATIONS

An inhalation technique error is the main factor that affect to the recurrent hospital admissions of patients with asthma in District General Hospital Embilipitiya. The most frequent errors observed in the inhalation technique were poor coordination between actuating the medication and inhalation. In adequate knowledge regarding the correct practice of using inhalation devices (use and cleaning) also affect as a barrier for optimum drugs delivery to lungs which enhance the hospital presentation. Personal factors like smoking and inappropriate habits (Evening bathing, having pets and consumption of cooled foods and beverages) also affects to the recurrent hospital admission due to the asthma as the genetical or physiological stimulation of the asthmatic condition. Further environmental factors like climatic changes also caused to the hospital admission of the asthmatic patient where uncontrolled by the asthmatic patients.

Minimizing the effect of above factors can control the recurrent hospital admission due to the asthma in asthmatic patient. Specially providing knowledge regarding risk factors of the disease, knowledge of the inhalation devices and proper demonstration on inhalation devices will have greater influence.

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