INTRODUCTION

Asthma exacerbation at emergency department (ED) is the one of cause of ED overcrowding, including in our setting in Thailand. Studies evaluating the effects of ED crowding result in reduced quality of care, increased medical error, and increased mortality. Therefore, having a better understanding of status asthmaticus and risk factors could reduce ED attendance and overcrowding. There are few data on the outcomes of the initial management of acute asthma exacerbation in the ED especially in Thailand. Here in, we describe the characteristics, treatment outcomes and factors associated with status asthmaticus in Thai patients presenting to single center ED.

METHODS

This study was a prospective cohort study conducted at the ED of Thammasat University Hospital (TUH), Thailand, from March 2016 to February 2017. All patients with a previous diagnosis of asthma in their medical record who presented with acute exacerbation were considered for inclusion. An exacerbations of asthma was defined by an episode of increased symptoms of shortness of breath, cough, wheezing or chest tightness and deteriorations in lung function. According to the previous literatures, patients who do not response within an hour of standard treatment were defined as status asthmaticus. The out-of-hospital cardiac arrest due to asthmatic attack and transferred patients were excluded. Patients were enrolled into the study after being informed and having given their written consent. The study was approved by the committee on Human rights related to research involving human subjects, Faculty of Medicine, Thammasat University.

The sample size was based on previous retrospective study at TUH that showed status asthmaticus rate of 25% using two proportion comparison method, we would need to recruit at least 129 patients. Data were analyzed using descriptive statistics. Categorical data were compared using Chi-squared or the Fisher exact test, as appropriate. Continuous variables between groups were analyzed using Wilcoxon-Mann-Whitney test or student t-tests depend on data distribution. We used a logistic regression to determine risk factors associated with status asthmaticus, entering independent variables with a univariate association of p < 0.1. A p-value of < 0.05 was considered to be statistically significant in multivariable analysis. Data were analyzed by STATA software version 14 (Stata Corporation, Texas, USA).

Characteristics and outcomes of treatment in status asthmaticus patients at emergency department

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RESULTS

Table1. Characteristics and outcomes of treatment in 209 asthma exacerbation patients

Characteristic	145 Status asthmaticus	64 Non status asthmaticus	P-value
Female gender, n (%)	86 (59.3)	37 (57.8)	0.839
Age; year, median (IQR)	33 (6, 54)	30 (17, 43)	0.386
Precipitating with URI, n (%)	132 (91.0)	36 (56.3)	< 0.0001
Initial predicted PEF, %	46.9 (12.3)	57.2 (24.7)	0.359
ED (LOS), minutes (IQR)	658.6 (240.0, 780.0)	150.3 (115.0, 180.0)	< 0.0001
Intubation, n (%)	6 (4.1)	0	0.099
Admit, n (%)	55 (37.9)	0	< 0.0001
Revisit in 1 week, n (%)	4 (2.76)	1 (1.6)	0.602

Table2. Multi-variable regression; factors associated with status asthmaticus

Characteristic	Risk ratio (95%CI)	P-value
Age > 60 years old	1.22 (1.01-1.46)	0.036
Controller used	0.75 (0.63-0.88)	0.001
ED visit in past year	2.23 (1.24-4.37)	0.009
Using MDI>1 canister/m	1.21 (1.01-1.45)	0.033
Co-morbid conditions	1.19 (1.01-1.41)	0.046
Retraction of chest	1.28 (1.01-1.68)	0.038

DISCUSSION

Data on status asthmaticus were limited. Our findings agree with previous studies in status asthmaticus patients by Chiang et al. and Carroll et al. They found that poor disease control and an URIT were factors associated with hospital admission. This study provided several important issues for improving the asthma management in Thailand. More patients' education should be implemented, including more thorough training on MDI techniques, and emphasizing the need to regularly use inhalers, which have been proven to prevent asthma exacerbations. Even though, there were several limitations in the present study. Firstly, this was a single-center study, hence the results might not be generally applied to all patients with asthma exacerbation. Secondly, the data was collected only at the ED. Therefore, the clinical information after ED disposition was not included. Nevertheless, our prospective cohort study was the first report of status asthmaticus in ED of Thailand and provided useful information for predicting treatment outcomes, improving the asthma management and ED administration for prevent ED overcrowded.

CONCLUSIONS

70% of asthma exacerbation patient diagnosed status asthmaticus. The factors including age> 60 yrs, using controller, ED visit, using MDI> 1 canister/m, co-morbid conditions, retraction of chest were associated with status asthmaticus at ED and the finding could help for better asthma exacerbation patient management, ED administration and asthma planing for future relapse.

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