Clinical and Economic Burden of Exacerbations in Patients with Severe Asthma in South Korea

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INTRODUCTION

- Healthcare utilization costs and mortality of patients with severe asthma are increasing every year. Moreover, asthma exacerbations occur frequently in patients with severe asthma, which lead to high healthcare costs and high risk of death.
- However, there are scant studies reporting the exacerbation related costs and death, using recent data in South Korea.
- We aimed to evaluate current disease burden of severe asthma in terms of exacerbations in the South Korean population.

METHODS

- **Data source**
  - The Health Insurance Review and Assessment Service-National Patient Sample (HIRA-NPS) between 2016 and 2020.
- **Study population**
  - Patients (aged ≥ 10 years) with severe asthma were defined as satisfying all following criteria:
  1) ≥1 claim of asthma diagnosis (ICD-10: J45-46);
  2) ≥1 claim of inhaled corticosteroid (ICS) or ICS/long-acting β2-agonist (LABA);
  3) ≥2 exacerbations requiring CS bursts or ≥1 exacerbation requiring emergency department (ED) visit or hospitalization.
- **Outcomes**
  - The number of exacerbations for each type of healthcare utilization (hierarchy according to severity was applied: intensive care unit [ICU] admission > general ward hospitalization > ED visit > outpatient visit).
  - The healthcare costs of exacerbations.
  - The 28-day case fatality rate after exacerbations requiring hospitalizations.
- **Statistical analysis**
  - We integrated outcomes from 5-year cross-sectional datasets.
  - All data were analyzed using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA).

RESULTS

- Patient characteristics

Characteristics	Patients with severe asthma (n=293)	Percentage (%)
Age group (years)		
10-19	11	3.8
20-29	14	4.8
30-39	20	6.8
40-49	27	9.2
50-59	50	17.1
60-69	57	19.5
≥70	114	38.9
Sex		
Male	114	38.9
Female	179	61.1

- Number of exacerbations and exacerbation-related costs

	Type of exacerbation (n=471)	Percentage (%)
Number of exacerbations		
Outpatient visit	214	45.4
ED visit	8	1.7
General ward hospitalization	221	46.9
ICU admission	28	5.9
Healthcare cost per exacrbation		
Outpatient visit	68,615 KRW ($53)	
ED visit	168,235 KRW ($130)	
General ward hospitalization	2,232,799 KRW ($1,728)	
ICU admission	11,147,146 KRW ($8,628)	

ED, emergency department; ICU, intensive care unit.
Costs were converted to US dollar (USD) by using the average exchange rate in 2022 (1 USD = 1,292 Korean won)

- The 28-day case fatality rate for exacerbation with hospitalization

	General ward hospitalization (n = 221)	ICU admission (n = 28)
Number of deaths	5	4
28-day case fatality rate (%)	2.3	14.3

ICU, intensive care unit.

DISCUSSION

- Exacerbations with general ward hospitalization occurred most frequently among all types of exacerbations in patients with severe asthma.
- The healthcare costs per exacerbation increased as the severity of the exacerbation type increased.
- In terms of exacerbation-related deaths, the 28-day case fatality rate for exacerbations with ICU admission was 6.32-fold higher than that for exacerbations with general ward hospitalization.
- As we integrated one-year cross-sectional datasets for five consecutive years, we could not capture outcomes at the end of each calendar year. Therefore, the period for identifying exacerbations among patients with severe asthma was one year, and we were only able to observe deaths that occurred in a period of less than one year.

CONCLUSION

- In considering healthcare costs of exacerbations and case fatality rates, clinical and economic burden of severe asthma was found to be substantial in South Korea.
- Effective strategies for managing patients and optimal treatment options are needed to alleviate the burden of severe asthma patients.

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