Productivity Loss in Severe Asthma: A Systematic Review

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Introduction

Severe asthma (SA) is defined as asthma that remains uncontrolled despite adherence to optimal treatment with high doses of ICS/LABA and control of associated factors, or that worsens when high dose treatment is reduced.[1]

Prevalence has been estimated to be around 5% to 10% of the total asthmatic population.[2]

The economic impact of SA is significant, incurring not only in high direct medical costs, such as increased inpatient admissions, emergency department (ED) visits, and also in indirect costs, such as loss of productivity. [2]

Asthma can impair a person's functioning to the point of interfering with school, work, and social activities.[3]

OBJECTIVE

To assess the impact of severe asthma on patients' or caregiver's productivity (including absenteeism, presenteeism, early retirement, work disability, and indirect costs).

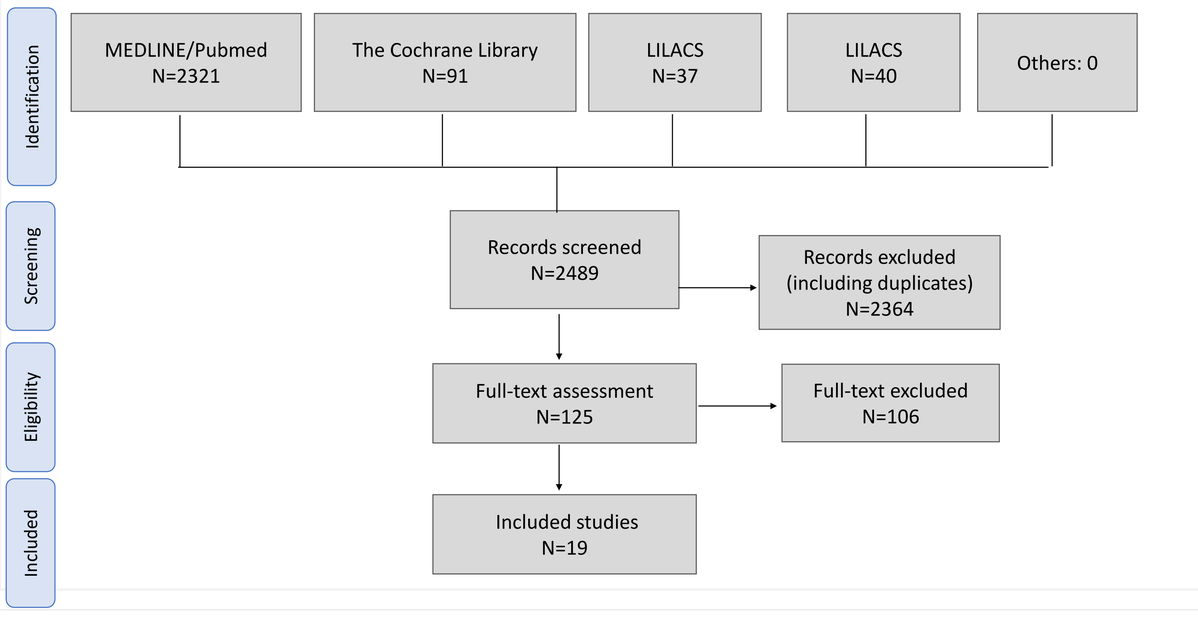
Methods

- A systematic search was conducted in January/2021 using MEDLINE, Embase, the Cochrane Library, LILACS, CRD and Google to identify published data reporting productivity losses related to severe asthma.
- Systematic reviews with meta-analyses, clinical trials and observational studies were eligible to inclusion. Narrative reviews, case reports or series were excluded.
- No language or publish date limits were used.
- Results were described qualitatively.

Figure 1. PubMed/MEDLINE search strategy

(("Asthma"[Mesh] OR "Asthmas" OR "Bronchial Asthma" OR "Asthma, Bronchial" OR "Asthma" OR "Severe Asthma")) AND (("Absenteeism"[Mesh] OR "Presenteeism"[Mesh] OR "Sickness Presence" OR "Presence, Sickness" OR "Absenteeism" OR "Presenteeism" OR "Productivity loss" OR "Cost of Illness"[Mesh] OR "Illness Cost" OR "Cost of Sickness" OR "Burden of Illness" OR "Illness Burden" OR "Illness Burdens" OR "Disease Burden" OR "Burden, Disease" OR "Disease Burdens" OR "Costs of Disease" OR "Disease Cost" OR "Cost, Disease" OR "Disease Costs" OR "Economic Burden of Disease" OR "Burden Of Disease" OR "Burden Of Diseases" OR "Cost of Disease" OR "Global Burden of Disease"[Mesh] OR "Global Burden of Disease" OR "Health Expenditures"[Mesh] OR "Health Expenditures" OR "Sick Leave"[Mesh] OR "Sick Leave"))

Figure 2. PRISMA Flowchart



Results

- Nineteen observational studies were included, most with a prospective (26%) or cross-sectional (32%) study design.
- Most studies (84%; n=16) evaluated adults, over 40 years of age. Sample size ranged from 32 to 605,614 included patients, most females.
- Five studies reported that approximately 40% of patients had asthma exacerbations in the last year.
- Overall, studies demonstrated higher presenteeism (16%; n=3), work absenteeism (47%; n=9), school absenteeism (10%; n=2), disability (16%; n=3) and indirect costs (42%; n=8) for SA patients comparing to controls. Methods used and outcomes considered were heterogeneous, including different instruments and recall periods.
- Three studies used Work Productivity and Activity Impairment (WPAI) questionnaire (two were versions specific to asthma) and one used Work Performance Scale (WPS).
- WPAI results indicated that 21.4% to 36.5% of work in the week before the assessment had some impairment (absenteeism/presenteeism) due to SA. Absenteeism were present in 21%-23% of hours worked in the last seven days before assessment and presenteeism in 20%-31% of work performed in the previous week before assessment.
- WPS score ranged from 75.4-85.7, according to asthma severity domains assessed (higher values indicating better performance at work, from 0 to 100).
- Presenteeism: 15% of patients had reduced work efficiency because of asthma, in a recall period of four weeks and more than half of patients with SA (56.70%) reported that their productivity was ≤50% in the last month.
- Absenteeism: average number of days of worked missed due to asthma was 3.67 in one month. Another study reported 27% of patients with SA missed at least one day of work in one year, with most patients missing >16 days per year.
- Studies in Brazil (n=2) showed up to 90% of SA patients were absent from school at least one day per year and 47% experienced job loss or had a family member who lost job because of asthma.
- Mean annual indirect costs per patient with SA ranged from BRL 1,259 to BRL 6,393 (1 USD = BRL 5.6417).

Table 1. Studies characteristics

Author, year	Study design	Country	Participants	Age (y); % male
Calhoun, 2014 (38)	Prospective	USA	1.186	Mean (SD): 44.1 (17.3); 33.1%
Chen, 2008 (37)	Prospective	USA	2.529	Mean: 47 (13 to 94); 31%
Cisternas, 2003 (40)	Prospective	USA	401	-; 29%
Eisner, 2006 (36)	Prospective	USA	465	Mean (SD): 48,9 (11,2); 28%
Erickson, 2004 (33)	Cross-sectional	USA	603	Mean (SD): 40,5 (12,4); 30,2%
Franco, 2009 (44)	Prospective	Brazil	180	Mean (SD): 45 (14); 16%
Gartland, 1999 (31)	Cross-sectional	USA	32	Mean (SD): 7,9 (2,1); 65,6%
Hiles, 2018 (32)	Prospective	Australia	536	Mean (SD): 54,8 (14,9); 40,1%
Jansson, 2020 (28)	Prospective and retrospective	Sweden	32	Mean: 59,6 (23 to 82); -
Kim, 2011 (35)	Cross-sectional	South Korea	314	Mean: 61,2; 43,5%
Kohen, 2010 (34)	Cross-sectional	Canada	8.914	Mean (SD): 10,8 (2,5); 57,7%
Lucas, 2020 (30)	Cross-sectional	France	96 with SA	Mean (SD): 42,4 (16,4); 42,7%
Melero, 2018 (29)	Retrospective	Spain	303	Mean (CI 95%): 54,3 (52,8 a 55,9); 33,3%
Ojeda, 2013 (27)	Cross-sectional	Spain	1.186	18 to 40 years: 48,5% 42 to 65 years: 51,5%; 41,3% (all ages)
Roncada, 2020 (43)	Cross-sectional	Brazil	66	Mean (SD): 9,7 (1,6); 42,9%
Sauni, 2001 (39)	Case-control	Finland	76 cases and 145 controls	-; 86%
Serra-Batlles, 1998 (45)	Cross-sectional	Spain	333	Mean: 42 (14 to 82); 36%
Settipane, 2019 (41)	Retrospective	USA	605.614	Mean (SD): 47 (16,2); 36,8%
Song, 2020 (13)	Cross-sectional	USA	183.537	Mean (SE): 59,6 (1,8); 75,5%

CONCLUSIONS

SA was associated with work impairment, presenteeism and absenteeism, in adults and children, demonstrating deep impact on patient's lives and society. Indirect costs increase with the level of asthma severity or lack of disease control, highlighting the importance of appropriate disease management and control. Funding: GSK (218072).

Disclosures

Silva DO, de Veras B e Bernardino G are GSK employees.

Bernardino G owns stocks/shares.

Dias L is an employee of ORIGIN Health Intelligence and conducted the study on behalf of GSK.

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