Productivity losses for allergic rhinitis patients in the Netherlands and Sweden

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Background

Allergic rhinitis [AR] affects more than 20% of the European population and is caused by sensitivity to environmental allergens, such as grass, tree and ragweed. The disease composes a significant burden to patients as it decreases quality of life [QoL][1,2,3], impacts sleep[1,4,5] and work and school performance.[1,6-8] The impairment of work and school performance presents an economic burden on society due to absenteeism and presenteeism. The results from an online survey on patient websites for AR in the Netherlands and in Sweden in 2018 are presented with the observed relationship between productivity loss and disease severity.

Methods

The survey combined the modified Allergic Rhinitis and its Impact on Asthma [m-ARIA] classification[9] and a questionnaire about absenteeism and presenteeism (modified Work Productivity and Activity Impairment Questionnaire with an increased recall period covering one year[10]). The survey also included demographic questions about gender, age-group and type of occupation. Inclusion criteria for the analysis was to be in paid employment and have AR, which was assessed via the ARIA questionnaire. The International Standard Classification of Occupations[11] was used to categorise options for occupation. Hourly income was estimated from occupation by use of the mean hourly earnings by sex, age and occupation database from Eurostat. Hours lost to absenteeism was estimated as the product of number of sick days over the last year and number of hours worked per day. Hours lost to presenteeism was estimated as the product of number of days with impairment, impairment while working with AR symptoms and the number of hours worked per day. Absenteeism and presenteeism were estimated as the product of hours lost to and hourly income. Productivity loss was estimated as the sum of absenteeism and presenteeism. The distributions for sick days, days with lower productivity, absenteeism, presenteeism and productivity loss were skewed to the right, therefore medians are reported instead of the arithmetic mean. All analyses were conducted in R version 3.6.1.

Results

A total of 232 respondents met the inclusion criteria for this study. 89 (38%) were from the Netherlands, and 143 (62%) were from Sweden. Of those, 11 had mild (5%), 175 (75%) had moderate and 46 (20%) had severe AR. Mild patients were excluded from the rest of the analysis due to the small sample size. 54% of respondents reported that AR symptoms interfered with their sleep, 58% reported that AR limited their daily activities, 32% reported that AR limited their participation in school or at work. Overall, 97% reported that they found their symptoms troublesome. The median number of hours lost to absenteeism was 8 (interquartile range [IQR] 6;10) hours per year. Correspondingly, a median of 12 (IQR 1;57) hours per year was lost to presenteeism. The median productivity loss was €433 (IQR 158;1530) per patient.

Results by disease severity

Moderate

42% of respondents with moderate AR reported that AR symptoms interfered with their sleep, 47% reported that AR limited their daily activities, 14% reported that AR limited their participation in school or at work, and 96% found their symptoms troublesome. The median number of hours lost to absenteeism was 8 hours per year (IQR 6;9), while hours lost to presenteeism was a median of 6.4 (IQR 0;48) hours per year. This corresponds to a productivity loss of €352 (IQR 136;1260) per year.

Severe

All respondents with severe AR reported that symptoms interfered with their sleep, limited their daily activities, participation in school or at work and that their symptoms were troublesome. This is by design, because the m-ARIA severity criteria categorise patients as severe if they say yes to all of the above questions. The median number of hours lost to absenteeism was 10 hours per year (IQR 7;24), while hours lost to presenteeism was a median of 42 hours per year (IQR 18;95). The median productivity loss was €1382 (IQR 445;2126) per year.

Results by country

Netherlands

59% of the Dutch respondents reported that AR symptoms interfered with their sleep, 64% reported that it limited their daily activities, 42% reported that it limited their participation in school or at work, and 97% found their symptoms troublesome. The median number of hours lost to absenteeism was 7 (IQR 5;9) hours per year, while hours lost to presenteeism represented a median of 4 (IQR 0;36) hours. The hours lost represented a productivity loss of €268 (IQR 119;1055) per year. For patient characteristics and productivity loss estimates in the Netherlands split by m-ARIA disease severity, c.f. Table 1.

Sweden

In Sweden, 50% of respondents reported that AR symptoms interfered with their sleep, 55% reported that it limited their daily activities, 25% reported that it limited their participation in school or at work and 97% found their symptoms troublesome. The median number of hours lost to absenteeism was 8 (IQR 8;12) hours per year, while hours lost to presenteeism was a median of 24 (IQR 1;68) hours per year. The hours lost constituted a productivity loss worth €673 (IQR 213;1901) per year. For patient characteristics and productivity loss estimates in Sweden split by m-ARIA disease severity, c.f. Table 2.

Table 1: Patient characteristic and productivity loss in the Netherlands by m-ARIA severity

Variable	m-ARIA disease severity		p-value
	Moderate	Severe	
n	61	25	
Gender female (%)	43 (70.5%)	20 (80.0%)	0.525
Age (mean, [sd])	41.92 (14.42)	39.60 (12.34)	0.483
Hourly income (mean, [sd])	17.44 (5.77)	17.79 (6.06)	0.862
Sick days (median, [IQR])	1.00 [1.00;1.00]	2.00 [1.00;4.75]	0.016
Days with lower productivity (median, [IQR])	1.00 [1.00; 10.00]	11.50 [5.75; 22.50]	0.004
Productivity impairment (mean, [sd])	2.69 (2.53)	4.55 (2.84)	0.009
Absenteeism in EUR (median, [IQR])	98.32 [68.48; 178.68]	148.13 [96.83; 405.66]	0.207
Presenteeism in EUR (median, [IQR])	37.62 [0.00; 319.92]	740.64 [114.16; 1455.59]	0.060
Productivity loss in EUR (median, [IQR])	196.64 [105.69; 538.16]	888.77 [379.90; 1700.08]	0.052

Table 2: Patient characteristics and productivity loss in Sweden by m-ARIA severity

Variable	m-ARIA disease severity		p-value
	Moderate	Severe	
n	114	21	
Gender female (%)	88 (77.2)	15 (71.4)	0.771
Hourly income (mean, [sd])	22.53 (6.39)	21.18 (6.06)	0.453
Age (mean, [sd])	39.81 (11.15)	39.62 (9.30)	0.942
Sick days (median, [IQR])	1.00 [1.00; 1.00]	2.00 [1.00; 5.00]	<0.001
Days with lower productivity (median, [IQR])	6.00 [1.00; 25.00]	20.00 [10.50; 39.25]	0.004
Productivity impairment (mean, [sd])	2.48 (2.00)	5.50 (2.55)	<0.001
Absenteeism in EUR (median, [IQR])	186.06 [133.44, 280.68]	282.96 [188.27, 475.38]	0.059
Presenteeism in EUR (median, [IQR])	208.62 [13.34, 1183.68]	1329.00 [467.04, 2450.40]	0.019
Productivity loss in EUR (median, [IQR])	565.32 [187.88, 1528.38]	1701.36 [892.93, 3232.60]	0.013

Key References

1) Canonica GW et al Allergy 2007; 62: 17-25. 2) Hossny E et al World Allergy Organ J 2017. 3) Doz M, et al. BMC Pulm Med 2013;13:15 4) Hadley JA et al. J Fam Pract. 2012;61(2 suppl):S11-S15. 5) Koinis-Mitchell D et al, J Allergy Clin Immunol. 2012; 130: 1275-1281 6) Nilsson S Pediatric allergy and immunotherapy 2018; 29 7) Hoz Caballer B et al Am J Rhinol Allergy 2012; 26: 390-394. 8) Walker S et al J Allergy Clin Immunol 2007; 120: 381-7. 9) Valero A. et al J Allergy Clin Immunol 2007; 120(2): 359–365. 10) Reilly, M.C. et al PharmacoEconomics 1993; 4(5): 353–365. 11) EC recommendation official Journal of the European Union 2009; 52: 31-47

Conclusion

This study shows that productivity loss for people with AR inceases with disease severity. Treating patients with AR is not only of benefit to the patients, but also for employers and society