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Five-fold increase in use of inhaled corticosteroids over 18 years in the general adult population in West Sweden

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Summary
Introduction: Asthma medication was increasingly used during the second part of the past century. There are few detailed data from population studies on use of asthma medication. The current study aimed to determine the use and determinants of asthma medication in West Sweden and to assess changes during the last two decades.
Methods: From a random population sample participating in a survey on respiratory symptoms, 2000 individuals were randomly selected for clinical examinations and structured interviews, 1172 participated. All subjects reporting asthma ($n = 1524$) were also invited, and 834 participated. In total, 964 subjects with asthma participated. Asthma medication use was assessed in the general population and among two severity categories of asthma: multi-symptom asthma (MSA) and "other" asthma (having fewer symptoms). Current data, from 2010, was compared with data from 1992.
Results: Asthma medication was used by 11% of the population, 4.4% used ICS with concurrent use of LABA, 3.3% used ICS without LABA, while 3.2% only used SABA. Compared with 1992, the prevalence of asthma medication use had increased with 54%, and use of ICS had increased from 1.5% to 7.7%.

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Conclusion: Subjects with MSA reported using asthma medication more frequently and at higher doses, and a higher proportion used ICS.A shift in asthma medication use has occurred since 1992, with increased use of ICS and decreased use of SABA only, implying better asthma control on a population level. Multi-symptom asthma should alert the treating physician to consider under-medication and/or poor treatment adherence.

Introduction

The prevalence of physician-diagnosed asthma has increased worldwide [1—4], and current Swedish data suggest the prevalence of asthma to be 7—10% [3,5,6]. This increase is supported by reports of a high incidence [7,8] but contrasts to reports of a stable or even decreasing prevalence of symptoms common in asthma, such as wheeze and attacks of shortness of breath when compared with results of studies performed in the 1980s and 1990s [3,9,10]. Thus there is an on-going debate whether asthma prevalence is increasing or not [6,11].

In western societies, the prevalence of users of asthma medication does not fully reflect the true prevalence of asthma [6,12]. Over the past decades an obvious increase in asthma medication use has been observed [5,6], partly as a consequence of an increased awareness of COPD. However, there are still only few large scale population surveys that have studied asthma medication use in more detail [12]. Patient reported use of asthma medication contribute to the validation of estimates of asthma prevalence and, even more importantly, give important insights into how asthma care function in society.

To contribute to the identification of asthma with more significant degrees of severity in population studies we have proposed the term multi-symptom asthma (MSA) [13]. MSA, defined as having physician-diagnosed asthma with multiple symptoms despite reporting use of asthma medication, is associated with decreased lung function, increased hyperreactivity and airway inflammation, exacerbations, emergency visits, night time awakenings [13] and chronic nasal symptoms [14]. The prevalence of MSA on a population level is 2% in West Sweden, in agreement with results from the Swedish capital Stockholm, located in the Eastern part of Sweden [3,13,14]. Tools for identifying more severe asthma in a population is important as severe asthma poses a great burden both on the individual and on society as it is associated with a decreased quality of life [15], increased morbidity with need of emergency care and life style restrictions [13] and high societal costs [16].

The present study is the first from the West Sweden Asthma Study to present clinical data from the entire cohort. The aim was to examine prevalence, distribution and determinants of asthma medication use in the general population of West Sweden. Further aims were to compare use of asthma medication in 1992 and 2010, and to determine the association between use of asthma medication in MSA versus other asthma.

Methods

Study population and participation

The West Sweden Asthma Study population has previously been described in detail [6]. In short, in 2008 a validated questionnaire, including the international GAL^{2}EN-questionnaire and the OLIN-questionnaire, [5,9,17] was mailed to 30 000 randomly selected subjects aged 16—75 years, living in the Swedish region of Västra Götaland. The response rate was 62%. A non-responder study showed high representativeness of the study area's population [18]. The study has been approved by the local Ethics Committee.

The results in the current paper are based on two subsamples of responders to the postal questionnaire. From the responders to the postal questionnaire, 2000 subjects were randomly selected and invited to clinical examinations, 1172 (59%) participated, 130 of whom reported asthma (11.1%). In addition, all subjects considered to have asthma according to the questionnaire, an additional 1524 subjects, were invited, 834 (55%) participated. In total, 964 asthmatics participated in the clinical examinations which were performed from winter 2009 to winter 2012. The selection procedure is described in Fig. 1.

Changes in asthma medication use were assessed by comparison with data from the European Community Respiratory Health Survey (ECRHS) I performed in 1992 in Gothenburg [19]. In the comparison only subjects aged 21—46 years, living in the city of Gothenburg were included (n = 430) to match the population of ECRHS I.

Clinical data

The examinations included an extensive structured interview, including a detailed questionnaire on use of asthma medication. Other measurements included mainly lung function measurements, fraction of exhaled NO and skin-prick tests. The questionnaire on asthma medication use included questions on type of medication; inhaled corticosteroids (ICS only), combination treatment (i.e. ICS and long-acting beta-2-agonists (LABA), separately or as a combined inhaler), oral steroids, LABA, short-acting beta-2-agonists, (SABA), leukotriene antagonists and bronchodilators through nebuliser. For ICS, the subjects stated the name of the medication, and what daily dose they used. Questions on frequency of use included 6 options; 1) never, 2) a few times/year, 3) a few times/month, 4) no more than