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## Original article

# Factors associated with poorly controlled asthma among adults in France

Facteurs associés à un mauvais contrôle de l'asthme en France

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#### Abstract

Objectives. – To describe the level of asthma control using the Asthma Control Test (ACT) in real life, and to identify factors associated with poorly controlled asthma (ACT score <20).

Methods. – Participating GPs and specialists had to include the first two consecutive patients with a diagnosis of asthma  $\geq$ 12 months at a consultation for asthma.

Results. — Of the 5508 adult patients screened by 987 physicians, 2165 were included in the cohort. They were 47% overweight, 81% non-smokers, 66% with an asthma diagnosis ≥10 years, and a median ACT score of 18 [5–25]. Asthma was poorly controlled in 62% of patients. Independent factors associated with poorly controlled asthma were: emergency visit for exacerbation of asthma during the past three months (odds ratio [OR]: 4.3; 95% confidence interval [95% CI] [2.9–6.3]), use of short-acting beta2-agonist (OR: 2.8; 95% CI [2.2–3.4]) or theophyllin (OR: 2.6; 95% CI [1.2–5.4]), being a current (OR: 2.1; 95% CI [1.6–2.8]) or a former smoker (OR: 1.4; 95% CI [1.1–1.7]), professionally inactive (OR: 1.9; 95% CI [1.3–2.8]), unemployed (OR: 1.9; 95% CI [0.9–4.0]) or retired (OR: 1.7; 95% CI [1.3–2.2]), being obese (OR: 1.7; 95% CI [1.2–2.2]), no use of combinations of long-acting beta2-agonist and corticosteroid (OR: 1.5; 95% CI [1.2–1.9]), being a woman (OR: 1.4; 95% CI [1.1–1.7]), and presenting an atopic dermatitis (OR: 1.4; 95% CI [1.1–1.8]).

Conclusion. – Treated asthma patients are still poorly controlled. Data are useful for patient care as they allow identifying high-risk patients with most prominent factor of having emergency visit for the exacerbation of asthma in the previous 3 months.

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Keywords: Asthma; Control; Asthma Control Test; Management

#### Résumé

Objectifs. – Décrire le niveau de contrôle de l'asthme avec le test de contrôle de l'asthme (ACT) en pratique courante et identifier les facteurs associés à un mauvais contrôle (score ACT < 20).

*Méthodes.* − MG et spécialistes devaient inclure lors d'une consultation pour l'asthme les deux premiers patients ayant un diagnostic d'asthme ≥ 12 mois.

*Résultats.* − Cinq mille cinq cent huit patients adultes ciblés par 987 médecins, 2165 inclus dans la cohorte : 47 % en surpoids, 81 % de nonfumeurs, 66 % avec un diagnostic d'asthme ≥ 10 ans, score ACT médian de 18 [5–25]. L'asthme était mal contrôlé chez 62 % des patients. Les

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facteurs indépendants associés au mauvais contrôle étaient : visite d'urgence pour exacerbation de l'asthme au cours des 3 derniers mois (OR : 4,3 ; IC 95 % [2,9–6,3]), utilisation d'un bêta2-agoniste de courte durée d'action (OR : 2,8 ; IC 95 % [2,2–3,4]) ou théophylline (OR : 2,6 ; IC 95 % [1,2–5,4]), fumeur (OR : 2,1 ; IC 95 % [1,6–2,8]), ancien fumeur (OR : 1,4 ; IC 95 % [1,1–1,7]), professionnellement inactif (OR : 1,9 ; IC 95 % [1,3–2,8]), chômeurs (OR : 1,9 ; IC 95 % [0,9–4,0]) ou à la retraite (OR : 1,7 ; IC 95 % [1,3–2,2]), obèse (OR : 1,7 ; IC 95 % [1,2–2,2]), sans combinaison de bêta2-agoniste à long terme et corticoïdes (OR : 1,5 ; IC 95 % [1,2–1,9]), être une femme (OR : 1,4 ; IC 95 % [1,1–1,7]), présentant une dermatite atopique (OR : 1,4 ; IC 95 % [1,1–1,8]).

Conclusion. – Les patients asthmatiques traités sont encore mal contrôlés. Ces données permettent d'identifier les patients à haut risque, l'exacerbation de l'asthme au cours des 3 derniers mois influençant principalement la visite d'urgence.

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Mots clés : Asthme ; Contrôle ; Test de contrôle de l'asthme ; Prise en charge

#### 1. Introduction

Asthma is a chronic inflammatory disease of the airways affecting 235 million people in the world [1]. There has been a sharp increase in the prevalence of asthma over the last few decades in all the industrialized countries [2]. In 2006, 10.2% of people reported having suffered from asthma at least once during their lifetime [2]. The prevalence of asthma in the French population whatever the gender was estimated to be 6.7% in 2006 (i.e. 4.15 million of asthmatics in France) [2]. The prevalence varied with age, decreasing among individuals aged from 20 to 50 years, and increasing to reach 7% in those 60 of age and over [2]. Additionally, the prevalence of asthma among smokers was higher in women than in men (7.8 versus 5.2%), but similar among former (6%) or non-smokers (7%) [2].

In France, hospitalizations for asthma have decreased since 1998 in adults but increased among very young children [2]. Regarding mortality, asthma death rates have steadily declined since 2000, reflecting a better management of asthmatics [2]. Nevertheless, asthma is still insufficiently controlled in real life despite efficacy of the available current therapeutic arsenal [3], and poor asthma control is the main risk factor of exacerbation of asthma [5]. In the French ER'Asthma study, general practitioners (GPs) found that asthma control was unacceptable in 72% of patients [4]. More recently, in 2006, the French Health, Health Care and Insurance survey (ESPS) carried out on the general population showed that only 39% of asthmatics were controlled, 46% partly controlled and 15% uncontrolled according to the GINA 2006 [2,6].

The national (HAS 2004) and international asthma guidelines (GINA) have emphasized the importance of focusing on asthma control rather than severity of asthma in clinical practice for good asthma control [6–8]. In the French ER'Asthma survey, normal BMI, non-smoker status, age under 50 years, use of fixed combination therapy (inhaled corticoids and long-acting  $\beta$ 2-adrenergic agonists), and good compliance to anti-asthmatic treatment were associated with optimal control of asthma [4]. In 2006, it was shown that inadequately controlled French asthmatics were more likely to be overweight or obese, age of 65 and over, with allergy (rhinitis, atopic dermatitis), and to belong to a disadvantaged social group [1,2]. Additionally, an asthmatic with obesity or with a current smoking status had a higher risk to be poorly controlled than an asthmatic with a

normal weight or with a non-smoker status, respectively [1]. Many papers have shown a positive link between asthma and two risk factors, namely obesity and smoking, and also with many comorbid conditions, such as depression, anxiety, eczema, gastroesophageal reflux disease or cardiovascular diseases [9].

The ATHMOS study was conducted in a large cohort of French patients with asthma in order to better understand factors associated with poorly controlled asthma that should help physicians to determine more efficiently the preventive measures with the greatest impact on asthma control and prevent the complications of the disease. The objectives of the present study were to describe the level of asthma control using the Asthma Control Test (ACT) in real life [10,11] and identify factors associated with poorly controlled asthma at inclusion and after a 3-month follow-up. This paper focuses on the cohort at inclusion and factors associated with poorly controlled asthma. The 3-month follow-up data and predictive factors of poorly controlled asthma will be presented in another paper.

#### 2. Design, methods and participants

#### 2.1. Study design

ATHMOS was a transversal and longitudinal epidemiological study of a large cohort of French asthmatic adult patients. The investigation was based on a sample of 1500 French physicians with private practice drawn at random from the CEGEDIM database (www.cegedim.com) and distributed as follows: 2/3 general practitioners (GPs) and 1/3 of allergists or chest physicians, as it was estimated that around 1/3 asthmatic patients had a follow-up with a specialist for asthma.

Each physician had to include the first two consecutive patients fulfilling required eligible criteria at a regular outpatient consultation for asthma throughout a period of 3 months. Enrollment was between September 2006 and September 2007.

#### 2.2. Selection criteria

Adult patients were eligible if they had a physician diagnosis of asthma for at least 12 months made at the discretion of each participating physician.

Eligible patients who gave their informed consent to participate in the study and were not participating in other

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