

Assessment of asthma control in pulmonary consultation in Ouagadougou, Burkina Faso

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Abstract

Background: Despite the recommendations now in force for the management of asthma, evidence suggests that many asthmatic patients still have their disease uncontrolled.

Objective: to assess asthma control and to identify the factors associated with uncontrolled disease among the patients received for consultation in the department of Pneumology in Ouagadougou, Burkina Faso.

Patients and methods: We conducted a cross-sectional study from 02/01/2015 to 01/31/2016 in the department of Pneumology of Yalgado Ouedraogo University Hospital in Ouagadougou. All asthma patients seen during this time frame participated in this study. The 2014 GINA criteria were used to assess the asthma control status.

Results: One hundred and two asthmatic patients were included (76 women and 26 men) with a mean age of 38.7 ± 18.6 years. Asthma was found to be well controlled in 26.5% of cases, partially controlled in 34.3% of cases and uncontrolled in 39.2% of cases. The following factors were found to be associated with an uncontrolled asthma: age >36 years ($p = 0.002$), low level of education ($p = 0.04$), allergic rhinitis ($p = 0.01$), overweight ($p = 0.03$), duration of asthma ≥ 10 years ($p = 0.04$), therapeutic non-compliance ($p = 0.00$).

Conclusion: Asthma was insufficiently controlled in our study. A tremendous emphasis must be put on not only on the therapeutic education of asthma patients, but also on a better management of comorbidities.

Asthma remains a public health problem worldwide. It is a chronic inflammatory airway disease that affects all age groups, with expensive care. An estimated 300 million people worldwide are living with asthma. The overall prevalence varies from 1-18% depending on the country.^{1,2} This prevalence is reported to be increasing in many developing countries, with the annual global mortality attributable to asthma being estimated at 250,000.² If asthma cannot be cured, its appropriate management can provide optimal control with positive effect on the patient's quality of life. The management of asthma is based on a global approach combining drug treatment and treatment of modifiable risk fac-

tors as well as non-pharmacological therapies and strategies.¹ Several international guidelines regarding the assessment of asthma control exist but those of the Global Initiative for Asthma (GINA) are the ones that have introduced the notion of control in the follow-up of the patient with asthma since 2006.¹ GINA recommends focusing patients' monitoring on asthma control, evaluating this control at each follow-up visit, and adapting the maintenance therapy accordingly.¹ Thus, the goal of our study was to assess asthma control and to identify the factors affecting this control, as evidenced in the department of Pneumology in Ouagadougou, Burkina Faso.

Patients and methods

A descriptive and analytical cross-sectional study was conducted over a twelve-month period (1 February 2015 to 31 January 2016) in the pneumology department of Yalgado Ouedraogo University Hospital (CHUYO). This department is one of the two reference departments specialised in low respiratory diseases in Burkina Faso. It is the largest in terms of the numbers of patients attending the facility and its capacity of reception of the patients.

The study included all known asthmatic patients (registered for at least one year), aged at least 15, regardless of gender, who were treated in our department during the study period. The diagnosis of asthma was based on a history of characteristic symptom patterns and an evidence of variable airflow limitation, from bronchodilator reversibility testing or other tests as recommended by GINA 2014.³

Patients who refused to participate in the study or did not meet our inclusion criteria were not taken into account; as well as patients with co-morbidity with repercussions on respiratory function such as cardiopathy or other associated lung diseases such as bronchial dilatation, bronchodysplasia, or chronic obstructive pulmonary disease (COPD).

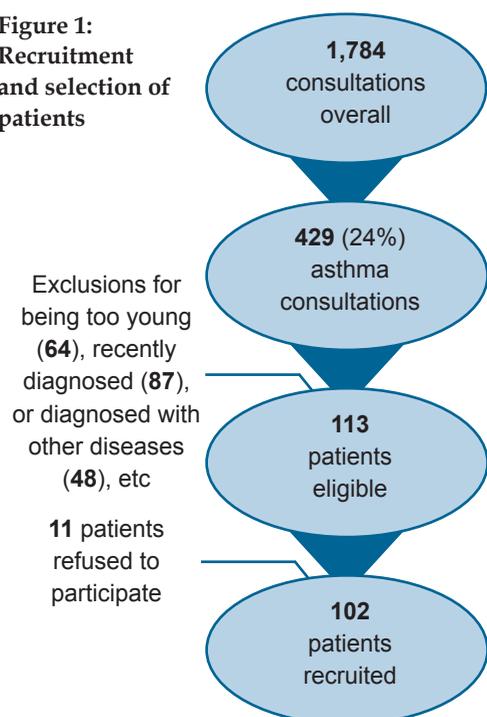
The data were collected on a survey card during an interview at the end of the consultation, following an explanation of the questionnaire to each patient and after obtaining his or her agreement. The questionnaire helped collect sociodemographic data, the age of onset of illness, asthma symptom control elements as recommended by GINA 2014,³ comorbidities, risk factors for exacerbations and causes of therapeutic non-adherence and non-compliance.

Asthma control according to GINA 2014 is based on the absence of daytime symptoms, nocturnal awakening symptoms, need for rescue medication and limitation to daily activities. The level of control of the symptoms of asthma was deemed:

- Well controlled when there were no criteria
- Partially controlled when 1-2 criteria applied
- Uncontrolled when 3-4 criteria were attested.

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Figure 1:
Recruitment
and selection of
patients



Adherence to treatment was defined as the degree to which a patient correctly follows medical advice. The method we used to assess adherence was self-report measures. Adherence to inhaled therapy, based on the 12 months observation period, was defined according to the percentage of prescribed inhalers dispensed to the patient and classified as follows: Complete adherence (> 80%), and low adherence (< 80%).

The collected data were typed and analysed using the software Epi Info in its version 7.2.1.0. The Pearson Gross Chi² test or Fischer's exact test were used for comparison of categorical variables when needed while quantitative variables were handled with the student test. Mean values were presented with the standard deviation as the dispersion index. The associations between the variables were considered statistically significant with the probability threshold of 0.05.

Results

Sociodemographic data and lifestyle: During our study period 1,784 medical consultations were held in the Pulmonary Department of the CHU-YO, including 429 for asthma or 24.04% of consultations. A total of 102 patients were included in our study (Figure 1). Seventy-six patients (74.52%) were female and 26 patients (25.5%) were male. The average age of the patients was 38.7 ± 18.6 years with extremes of 15 and 82 years. Eighty percent (80%) of patients were living in the city of Ouagadougou and 73.5% of them had at least high school education level while 17.6% never attended school. Eighty-eight patients (86.3%) included in the study did not have social security coverage and 58.6% had a monthly income of less than US\$90. Emissions from cars, dust, cockroaches and mouldy bits were the most common exposure factors in the environment at respectively 89.2%, 85.3%, 85.3% and 68.6% of our patients.

Medical history and comorbidities: In our study population,

46.2% of patients were known to have been asthmatic for at least ten (10) years. The average duration of disease progression was 13.45 ± 13.4 years. Eighty-five patients (83.3%) reported being regularly followed medically. All patients were under inhaled short-acting β -agonist as needed. Seventy-five patients (73.5%) were under inhaled corticosteroid and long-acting β -agonist in combination (dry powder inhale) and 27 (26.5%) were under inhaled corticosteroid (pressurised metered-dose inhalers). As regards the patients who knew how to use the devices, their proportion what established at 86.3%

A notion of smoking was found in 38 patients (4 active and 34 second-hand smoking). Atopic disorder was attested in 86 patients (84.3%). The comorbidities were dominated by allergic rhinitis (70.6%), GERD (37.3), overweight (24.5%), and obesity (20.6%).

Control and non-control factors of asthma: Our study showed that 26.5% of asthmatics were well controlled, 34.3% partially controlled and 39.2% uncontrolled. Adherence to treatment was investigated and 37.3% of the patients were found to be non-adherent. The cost of treatment was the leading cause of non-adherence and non-compliance (59.8%) followed by geographic access to healthcare facilities (34.3%). Table 1 divides patients by causes of non-adherence to and non-compliance with treatment. Factors associated with uncontrolled asthma were age >36 years (OR = 5 [1.8 - 13.7], $p = 0.002$), low level of education (OR = 3.72 [1.1 - 16.9], $p = 0.04$), allergic rhinitis (OR = 3.1 [1.2 - 8.1], $p = 0.02$), and non-adherence to treatment (OR = [4.3 - 196], $p = 0.00$). Other factors associated with uncontrolled asthma are summarised in Table 2.

Discussion

Our study focused on the control of asthma in patients treated in the Pulmonary Department of CHU-YO. Biases and limits could have been introduced, such as selection bias (the Pulmonary department being a specialised medical department, admitted patients could be those with hard-to-manage asthma), unavoidable prevarication bias and memorisation bias. However, our study showed that the proportion of asthma consultations accounted for 24.04% of all consultations in the Pulmonary Department of CHU-YO. These findings show that asthma is really a public health problem, particularly in light of the fact that it is a chronic disease requiring constant monitoring let alone its prohibitive treatment cost for many. The prevalence of the condition is estimated in the literature from 1-18% depending on the country. This prevalence is reported to be increasing in a number of countries, particularly those in the developing world.¹

Our study revealed that asthma was well controlled in 26.5% of cases, partially controlled in 34.3% of cases, and not controlled in 39.2% of cases. Other authors in Africa, including Bennani in Algeria, Ndiaye in Senegal, and Aissa in Tunisia^{4,5,6} found uncontrolled asthma in respectively 74%, 96.67% and 90% of their patients. In France, 6 out of 10 asthmatics are reported to be partially or not controlled.⁷ We found through the analysis of these data that asthma remains insufficiently controlled.

The factors associated with uncontrolled asthma in our study were comorbidities, living environment, and non-adherence to treatment.

Table 1: Distribution of patients by causes of non-adherence and non-compliance to treatment

Causes of non-adherence and non-compliance	n	%
Cost	61	59.8
Geographical access to healthcare facilities	35	34.3
Forgetfulness / confusion	31	30.4
Complex therapeutic regimen	26	25.5
Misunderstanding instructions / inappropriate explanations	23	22.5
Difficulties in accessing a specialist	23	22.5
Fear of side effects	16	15.7
Fear of discrimination	16	15.7
Thinking that treatment is unnecessary	12	11.8
Several of inhalers	08	7.8
Denial of asthma and its treatment	02	2.0
Cultural reasons	01	0.98

Table 2: Factors associated with uncontrolled asthma

Variables	Patients	Uncontrolled asthma, n (%)	OR [CI 95%]	p-value
Asthma duration				
< 10 years	55	36 (65.4)	2.5 [1.1–6.9]	0.04
≥ 10 years	47	39 (83)		
Atopic disorder				
No	16	08 (50)	3.5 [1.1–12]	0.03
Yes	86	67 (77.9)		
Tabagism				
No	64	43 (67.2)	2.6 [0.9–8]	0.08
Yes	38	32 (84.2)		
Regular physical activity				
No	55	43 (78.2)	1.67 [0.7–4.1]	0.3
Yes	47	32 (68.1)		
Allergic rhinitis				
No	30	17 (56.7)	3.1 [1.2–8.1]	0.02
Yes	72	58 (80.6)		
Overweight				
No	77	52 (67.5)	5.4 [1.3–37]	0.03
Yes	25	23 (92)		
GERD				
No	66	46 (69.7)	1.8 [0.7–5.1]	0.34
Yes	36	29 (80.6)		
Regular follow-up				
No	17	16 (94.1)	7 [1.1–56]	0.03
Yes	85	59 (69.4)		
Adherence				
No	38	37 (97.4)	25 [4.3–196]	0.0
Yes	64	38 (59.4)		
Incorrect technique				
No	88	63 (71.6)	2.4 [0.5–23.2]	0.4
Yes	14	12 (85.7)		
Social security coverage				
No	88	64 (72.7)	0.7 [0.1–3]	0.75
Yes	14	11 (78.6)		

Moreover, the vast majority of our patients were exposed to cars gas emission (89.2%), dust (85.3%), cockroaches (85.3%) and mouldy bits (68.6%) as has already been pointed out. These factors are recognised as important factors in triggering asthma attacks.^{8,9}

About ¾ of patients were women. This female predominance is classically found in the literature.^{6,10} Asthma in women has specificities modulated by hormonal life. In terms of age, we found average of 38.7 years. Our analysis also showed that age >36 years is significantly associated with uncontrolled asthma (OR=5, p=0.002). Although the general treatment regimen differs little from that of young asthmatics, a whole series of events complicates the management of asthma when the subject is getting older.¹¹ Older patients, having mostly several debilities, and thus being poly-medicated, would have more difficulties to be

compliant with their treatments. The chronicity of the disease could also be one reason. Moreover, in our study, an evolution duration of the disease greater than or equal to ten years appeared as a factor favouring uncontrolled asthma (OR = 2.5, p = 0.04).

In general, these patients would therefore not be observant of treatment. Therapeutic compliance in chronic diseases has always been a subject of study and of major concern, with asthma being one of the greatest preoccupations for this problem. These chronically ill patients, with good knowledge of their symptoms, would no longer be quick to visit healthcare facilities. They would therefore be more inclined to practicing self-medication, resulting in poor control of asthma. For adherence to be optimal, it is required that the patient accepts the idea of a treatment and that he or she adhere to the doctor's recommendations. Hence the interest of talking about therapeutic adherence.¹²

Therapeutic adherence refers to the willingness and thoughtful approval of the individual to manage his or her illness.¹² It is the degree of acceptance of the patient with respect to his or her therapy. However, this adherence can be fluctuating and subject to psychosocial and motivational factors that can hinder it and consequently affect compliance.

There are a number of factors now identified in the literature that hinder or improve care practices.^{12,3} Adherence to treatment was therefore investigated during our interrogation by empathic

questions, as recommended by GINA.³

We estimated that only 38 patients (37.3%) were adherents; and this negatively influenced the control of asthma to a considerable extent (OR = 25, $p = 0.00$). The most common causes of non-adherence and non-compliance were the high cost of drugs (59.8%), difficult geographical access to healthcare facilities (34.3%) and forgetfulness (30.4%). The complexity of the proposed treatment regimen (25.5%), misunderstanding of instructions, and even inappropriate explanations (22.5%) as well as difficulties in accessing a specialist (22.5%) were also noted as causes of non-adherence and non-compliance.

Our data accord perfectly with those found in the non-compliance and non-adherence literature.^{1,6,13,14,15} To overcome the difficulties noted, education seems to be a key factor which serves as an interesting and even unavoidable lever healthcare providers need to encourage patients to adopt favourable attitudes towards their therapeutics and to induce them to autonomously manage their illness and their treatments. The establishment of personal action plans for the self-management of the patient's illness and the improvement of the doctor-patient dialogue is necessary.¹ We believe that it is right to take these assessments into account, and to urge asthma patients to come together in an association, similar to those already existing in our country for other chronic diseases (diabetes, chronic renal failure). They will thus be able to advocate to health authorities for the introduction of social security coverage, or a subsidy for the costs of treatment (especially since 86.3% of our patients did not benefit from social security coverage and 58.6% had a monthly income of less than US\$90).

Other comorbidities were associated with uncontrolled asthma in our study, including allergic rhinitis (OR = 3, $p = 0.02$), and overweight (OR = 5.4, $p = 0.03$). GERD was present in 37.3% of patients. In this respect, our data do not differ from the already existing literature.^{4,16,17,18} GINA recommends the management of comorbidities of asthma patients as they may contribute to the burden of symptoms, reduce quality of life, lead to drug interactions, and possibly contribute to poor asthma control.¹

Conclusion

Asthma is found to be insufficiently controlled in the majority of patients in our study. Several factors are incriminated, including non-modifiable risk factors (such as age, gender, atopic disorder) and modifiable risk factors that are more relevant to patients' disease behaviours. Thus, in order to improve these levels of asthma control, we argue that the key is to be found in the therapeutic education of asthmatic patients and better management of comorbidities.

Author declaration

Competing interests: none.

Any ethical considerations involving humans or animals: none.

Was informed consent required? No.

References

1. Global Initiative For Asthma. Global Strategy For Asthma Management And Prevention, 2017; 159p.
2. Organisation Mondiale de la Santé. Asthme aide-mémoire. Révision 2012 ; 307 : <http://www.who.int>.
3. Global Initiative For Asthma. Global Strategy for Asthma Man-

- agement and Prevention, 2014; 148p.
4. Bennani MA, Drissi F, Kebbati S, Machou K, Boukhari S, Guermaz M. Evaluation du contrôle et des facteurs associés au mauvais contrôle de l'asthme. *Rev Mal Respir*, 2016 ; 33 : A78.
5. Ndiaye E, Toure N, Thiam K, Cisse M. Profil clinique et évaluation de la prise en charge des patients asthmatiques suivis à la clinique de pneumologie du CHNU de Fann selon les critères de GINA. *Rev Mal Respir*, 2016 ; 33 : A82.
6. Aissa I, Gharsalli H, Khattab A, Driss L, Ghedira H. Etat de contrôle de l'asthme en Tunisie. *Tunis Méd*, 2010 ; 88 (02) : 97-101.
7. Afrite A, Allonier C, Come-Ruelle, Guyen N. L'asthme en France en 2006 : Prévalence et contrôle des symptômes, IRDES. *Questions d'économie de la santé* N°138. 2008. 8p.
8. Koffi N, Ngom A, Kouassi B, Horo K, Gondola P, Aka-Danguy E. Profil de l'asthmatique adulte suivi en consultation en milieu africain à Abidjan. *Med Afr Noire*, 2001 ; 48 : 11 : 478-80.
9. Allergic Rhinitis and its Impact on Asthma. Guide de poche ARIA, 2001: 28p.
10. Dje-Bi I, N'dhatz-Sanogo M. L'évaluation de la prise en charge de l'asthme dans les centres de santé de Bouaké en 2015: état des lieux à propos de 144 asthmatiques enquêtés. *Rev Mal Respir*, 2016; 33: A79-A80.
11. Radenne F, Verkindre C, Tonnel A B. L'asthme du sujet âgé. *Rev Mal Respir*, 2003; 20: 95-103.
12. Lamouroux A, Magnan A, Vervloet D. Compliance, observance ou adhésion thérapeutique: de quoi parlons-nous ? *Rev Mal Respir*, 2005; 22 (1): 31-4.
13. Elatiqi K, Zaghba N, Benjelloun H, Yassine N. Observance thérapeutique et suivi des malades asthmatiques. *Rev Mal Respir*, 2016; 33: A69.
14. Lakhdar N, Elkhattabi W, L'youssefi H, Aichane A, Afif H. Évaluation de l'observance thérapeutique dans l'asthme. *Rev Mal Respir*, 2015; 32: A56.
15. Sakly H, Hamdi B, Berraies A, Jarraya D, Mazaoui S, Blibech H, et coll. Évaluation de l'observance thérapeutique chez les asthmatiques dans un service de pneumologie. *Rev Mal Respir*, 2016; 33: A75.
16. Gagara Issoufou M A, Assao Neino M M, Adambounou S, Ouedraogo A R, Bouzou Mamane M, Attahirou I, et al. Profil de sensibilisation aux pneumallergènes des patients asthmatiques à Niamey. *J Fran Viet Pneu*, 2016; 21 (7): 1-59.
17. Assao Neino M, Gagara Issoufou M A, Ouedraogo A R, Bonkano Soumana A, Maizoumbou D. Asthme et comorbidités. *Rev Mal Respir*, 2016; 33: A69.
18. Jridi S, Sajjai H, Serhane H, Amro L. Impact du tabagisme sur le contrôle de l'asthme. *Rev Mal Respir*, 2016; 33: A78.