ASTHMA IN THE PRIMARY CARE SETTING

Asthma care practicing among general practitioners in Lebanon: a cross-sectional study

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Abstract

Objectives: The aim of this study was to characterize the current practice of asthma among general practitioners (GPs) in Lebanon. Methods: Out of 2450 Lebanese registered GPs, a representative sample of 330 were stratified by region to fill out the questionnaire constructed on the basis of surveys developed mainly by the Chicago Asthma Surveillance Initiative Report Team in newly moderate persistent asthma patients aged 5 years and above. The questionnaire included information about ascertaining diagnostic techniques, pharmacotherapeutic approaches, formal patient education program; asthma related continuing medical education and asthma practice guidelines. Results: Totally, 302 completed the questionnaire achieving a response rate of 91.5%. Chest radiography was the most commonly used diagnostic test (98%), while stain for eosinophilia was the less commonly used (7.9%). For clinical monitoring, cough and wheezing (98.7%) were mostly assessed. Short acting inhaled β2-agonists were often the most prescribed (94.3%) followed by inhaled corticosteroids (87.4%) then by long acting β2-agonist (LABA) and theophylline (27.5% and 20.9%, respectively). Moreover, 10% of GPs provided formal asthma education program, 72.2% attended professional education and 65% adopted guidelines. Conclusion: Based on current international guidelines, the overall Lebanese GPs practice of asthma management is not at an acceptable standard. Therefore, it is recommended to improve monitoring parameters, implement the asthma guidelines nationally and improve patient education.

Keywords

Control/management, education, epidemiology, pharmacotherapy

Introduction

Asthma is one of the most common chronic illnesses worldwide [1]. As of 2011, the World Health Organization (WHO) estimated that globally, around 235 million people suffer from asthma [1]. Many strategies have been employed to decrease asthma related mortality and morbidity [2–5]. The National Asthma Education and Prevention Program (NAEPP), which was founded by the National Heart, Lung, and Blood Institute (NHLBI), has established guidelines for the proper diagnosis and treatment of asthma [6]. Despite these guidelines, increases in the prevalence, morbidity, mortality and economic burden of asthma have been reported throughout the world [7–9]. This impacts the physical, emotional and social well-being of sufferers [1,10].

Asthma needs to be recognized as a health priority in the developing world. Increasing urbanization further increases asthma incidence rates with consequent rises in asthma-related morbidity and mortality [11].

Successful management of asthma requires that the physician be cognizant of the national recommendations, including pharmacotherapy and measures to prevent and control exacerbations [12].

Significant differences in the management of asthma are also apparent between specialists and general practitioners (GPs) [13]. GPs play a key role in both identifying poorly controlled asthma and improving disease management outcomes since many asthmatic patients in rural communities are initially seen by them [5,14]. In a recent European study, GPs were experts at excluding those who did not have asthma (specificity 99%), but poorly diagnosed those who had current asthma (sensitivity 59%) [15].

There is a little published information in developing countries describing primary-care physicians’ willingness to embrace the guidelines and assess their practice in managing asthma [16,17].

Compositional differences in educational experience among Lebanese GPs may contribute to heterogeneity in treatment strategies [18]. The physician’s practice in managing asthma must be region-specific to ensure that they are tailored to the needs of a given region [19]. Thus, the aim of

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The questionnaire included information ascertaining asthma diagnostic techniques (chest radiography, spirometry, skin testing or radioallergosorbent testing (RAST), daily peak expiratory flow (PEF) monitoring, sinus radiography and sputum exam for eosinophils) used for new asthma patients aged 5 years and above, the clinical monitoring by physicians during regular office visits and the availability or access to spirometry, pharmacotherapeutic approaches to treat asthma, availability of formal patient education program in their clinics, involvement in continuing medical education activities related to asthma, use of asthma practice guideline and demographic characteristics (age, gender, country of medical degree and specialty, year of medical degree graduation and number of asthma patients seen per week).

The validity of the questionnaire was ensured through a pilot sample of 15 GPs who stated that the clarity of the questionnaire was satisfactory with no ambiguity.

Evaluation of asthma treatment was made through two questions: the first was about the medication/s to be used for patients aged 5 years and above with moderate persistent asthma. The second question was in a form of hypothetical clinical scenario: “what are the other medications needed for a patient aged 5 years and above with an uncontrolled asthma maintained on short acting β2-agonist inhaler?”. Options that included inhaled steroids as mono-therapy or combination were considered as consistent with Global Initiative for Asthma (GINA) guidelines, otherwise were considered inconsistent [5].

Statistical analyses

Region (Beirut, Bekaa, Mount Lebanon, North, South)-stratified random sampling was drawn to ensure that the sample was nationally representative. Data analysis was conducted using SAS software (SAS Institute; Cary, NC) to calculate frequency distributions. Means were reported with their corresponding standard deviations (SDs) and frequencies with percentages.

Results

A total of 330 questionnaires were distributed among GPs, of whom 302 completed the questionnaire achieving a response rate of 91.5%.

The characteristics of 302 Lebanese GPs are presented in Table 2. Their mean post graduated period was 14.2 years with small number of female GPs (19%) compared to male GPs (81%). Only 19 (7%) of GPs treated more than 10 asthmatic patients per week.

Evaluation and clinical monitoring of asthma patients

For the initial evaluation, chest radiography was the most commonly used diagnostic test by 296 (98.0%) GPs, while sputum exam for eosinophils was the less commonly used diagnostic test (7.9%). Spirometry performed by 142 (47.0%) GPs 3 (0.7%) were performed on site, 139 (46.3%) were performed in specialized centers). In addition, only one GP (0.3%) referred a patient to a specialist for spirometry. In addition, daily peak flow was performed by 63 (20.9%) GPs and 68 (22.5%) GPs referred their patients to allergologist for skin testing or RAST (Table 3).
Table 2. Sociodemographic characteristics of GPs participating in the study \( (n = 302) \).\(^a\)

| Characteristics                  | No. (%) of participants |
|----------------------------------|-------------------------|
| **Age (years)**                  | 40.0 (±6.7)             |
| **Gender:**                      |                         |
| Male                             | 245 (81)                |
| Female                           | 57 (19)                 |
| **Years of practice**            | 14.2 (±6.6)             |
| **Residency**                    |                         |
| Beirut                           | 43 (14)                 |
| Bekaa                            | 76 (25)                 |
| Mount Lebanon                    | 68 (23)                 |
| North                            | 57 (19)                 |
| South                            | 58 (19)                 |
| **Medical education graduates**  |                         |
| Eastern Europe                   | 149 (49.3)              |
| Lebanon                          | 70 (23.2)               |
| Arab countries                   | 39 (12.9)               |
| Western Europe                   | 25 (8.3)                |
| Others                           | 19 (6.3)                |
| **Asthmatic patients in a week** |                         |
| 1–4 patients                     | 157 (52)                |
| 5–10 patients                    | 126 (41)                |
| >10 patients                     | 19 (7)                  |

\(^a\)Data are presented as mean (±SD), or number (%).

Table 3. Asthma diagnostic techniques and clinical monitoring used by participating GPs for asthmatic patients.\(^a\)

| Diagnostic techniques               | No. (%) of participants |
|-------------------------------------|-------------------------|
| Chest radiography                   | 296 (98.0)              |
| Spirometry                          | 142 (47.0)              |
| Skin testing or RAST                | 68 (22.5)               |
| Daily peak flow monitoring          | 63 (20.9)               |
| Sinus radiography                   | 33 (10.9)               |
| Sputum exam for eosinophils         | 24 (7.9)                |
| Clinical monitoring                 |                         |
| Frequency of cough and wheezing     | 297 (98.7)              |
| Frequency of \( \beta_2 \)-agonist use | 288 (95.4)           |
| Frequency of sleep disturbances     | 215 (71.2)              |
| Review of inhaler technique         | 166 (55.0)              |
| Activity level                      | 73 (24.2)               |
| Loss of work/school days            | 31 (10.3)               |
| Peak expiratory flow                | 18 (6.0)                |
| Peak expiratory flow diary review   | 9 (3.0)                 |

\(^a\)Data are presented as number (%).

Table 4. Pharmacotherapeutic approaches reported by participating GPs for patients ≥5 years old with moderate persistent symptoms.\(^a\)

| Medications                         | Often | Sometimes | Rarely | Never |
|-------------------------------------|-------|-----------|--------|-------|
| Inhaled short acting \( \beta_2 \)-agonist | 285 (94.4) | 12 (4.0) | 4 (1.3) | 1 (0.3) |
| Oral \( \beta_2 \)-agonist          | 9 (3.0) | 18 (6.0) | 75 (24.8) | 200 (66.2) |
| LABA                                | 83 (27.5) | 142 (47.0) | 67 (22.2) | 10 (3.3) |
| Inhaled corticosteroids             | 264 (87.4) | 26 (8.6) | 12 (4.0) | 0 (0.0) |
| Oral corticosteroids                | 1 (0.3) | 20 (6.6) | 240 (79.5) | 41 (13.6) |
| Theophylline                        | 63 (20.9) | 159 (52.6) | 70 (23.2) | 10 (3.3) |
| Leukotriene antagonist              | 36 (11.9) | 89 (29.5) | 120 (39.7) | 57 (18.9) |
| Cromolyn sodium                     | 1 (0.3) | 1 (0.3) | 50 (16.6) | 250 (82.8) |
| Oral anti-histamines                | 8 (2.6) | 40 (13.3) | 204 (67.5) | 50 (16.6) |

\(^a\)Data are presented as number (%).

Treatment approach comparison of uncontrolled asthmatics on inhaled short acting \( \beta_2 \)-agonists treatment with GINA recommendations are presented in Figure 1. Of all, 78.1% prescribed inhaled corticosteroids, of which 44.7% were prescribed alone and the remaining 33.4% were prescribed in combination with one of the following: LABA, LA, LABA & LA and others.

**Patient education and continuous medical education**

Almost 90% of GPs did not provide a formal asthma education program for their patients.

Awareness of the GINA Guidelines was high, with 85% of GPs reporting that they have heard of the guidelines and 72.5% reporting of having read them. Moreover, 65% of GPs reported GINA Guidelines as the most adopted guidelines.

Most of the GPs (72.2%) attended a variety of professional education related to the management of asthma.

**Discussion**

To understand the current asthma management practice in Lebanon, a nationwide sample of GPs were surveyed to determine their actual asthma practices.

Lebanese GPs practice was consistent with international guidelines for patients ≥5 years old with moderate persistent asthma as inhaled short acting \( \beta_2 \)-agonist was often prescribed (94.4%). However, for uncontrolled asthmatics aged 5 years and above on inhaled short acting \( \beta_2 \)-agonist, our GPs showed lower compatibility with GINA Guidelines as 78.1% prescribed inhaled corticosteroids compared to (95.7%) in Chicago asthma surveillance [21]. Corticosteroids remains the most potent primary controller medication for asthma [22]. Those who were not well controlled on inhaled steroids (33.4%), the addition of LABA or leukotriene antagonists might improve their asthma control [23–25]. GPs who are inconsistent with GINA Guidelines, still prescribe theophylline (13.6%) over LABA (6%) or leukotriene receptor antagonists (1%). This could be due to the lack of awareness on asthma treatment, or more likely, because theophylline preparations were cheaper than inhalers.

The compliance of GPs with the guidelines showed variability between Asian and European countries [16,26–28]. In Karachi, Pakistan, a cross-sectional survey conducted...
by Bhulani et al. found inadequate knowledge of asthma medications among GPs in comparison with the GINA Guidelines and only 10.4% of GPs had adequate practice in asthma management [16]. Similarly, a study by Hussain et al. demonstrated serious deficiencies in the knowledge and attitude of GPs in the management of asthma patients in Pakistan [26]. Moreover, in Genoa, Italy Kryj-Radziszewska et al. found that only 20% of the GPs were able to answer correctly the questions regarding asthma control [27]. However, in Poland, a study by Braido showed a higher GPs compatibility with the guidelines; 42% in the part ‘‘General principles of treatment’’ and 65% in ‘‘Pharmacotherapy’’ [28]. The polish figures are more comparable to our findings.

The present survey showed that PEF monitoring was not commonly used by GPs. This is recommended by GINA Guidelines. Possible limited availability or access to PEF meters may be a factor [29]. When this data was compared to data from Grant et al. [21], the utilization of PEF was much less among our GPs (20.9% versus 47.5%).

Our ratios of ordering spirometry (47%) and RAST (22%) were comparable to Chicago asthma surveillance (54.6% and 14.1%, respectively) [21]. Similarly, the sputum examination and stain for eosinophilia rates were comparable between Lebanon and Chicago (7.9% versus 5%, respectively). The RAST has a sensitivity of 70–75% for the detection of allergen-specific IgE [30]. Increase in sputum eosinophils as a predictor of airway inflammation is often seen in patients with asthma [31]. In some cases, patients with uncontrolled asthma and airway hyper-responsiveness (PC_{20} <4 mg/ml) demonstrated an increase in sputum eosinophils to a median of 4.5% [32], but this observation has not been consistently demonstrated [33].

The perception of strict asthma control has evolved over the past years. While the goals set by GINA [5] and NAEPP [34] Guidelines seem unrealistic and unachievable for some clinicians, but meticulous monitoring, treatment and education can make it possible [35]. We were able to identify important aspects of asthma monitoring in Lebanon that were divergent to the international guidelines. Activity levels and loss of work or school days due to asthma were not routinely asked by GPs (24.2% and 10.3%, respectively). GPs are not expected to comply with the use of spirometry as it is not included in their routine practice which was clearly reflected in our findings.

Patient education is an essential component of asthma care. Our survey showed that patients warrant better education about asthma as only 10% had previous asthma education program. This could be related to limited availability or awareness of this program.

**Conclusion**

Based on current international guidelines, the overall Lebanese GPs practice of asthma management is not at an acceptable standard. Therefore, it is recommended to improve monitoring parameters, implement the asthma guidelines nationally and improve patient education.
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Declaration of interest
The authors declare no conflicts of interest. No funding was sought or received for this study.

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Appendix 1

Dear Dr.,

We are conducting a cross sectional study to evaluate the current practice of Lebanese GPs in managing asthma. You are kindly asked to take few minutes to answer the following questionnaire.

1) Age: _______ years
2) Sex: ☐ Male ☐ Female
3) Year of medical school graduation: __________
4) Where did you study medicine (country)? _______________
5) How many patients with asthma do you see weekly?
   ☐ 1–4  ☐ 5–10  ☐ >10
6) What diagnostic technique(s) do you do for newly diagnosed patients with asthma?
   (Check all applicable items)
   ☐ Chest radiography  ☐ Spirometry  ☐ Skin testing or RAST
   ☐ Sinus radiographs  ☐ Trail of daily peak flow monitoring
   ☐ Sputum examination and stain for eosinophilia
7) What do you monitor during office visits?
   ☐ Frequency of cough and wheezing
   ☐ Frequency of β2-agonist use
   ☐ Frequency of disturbed sleep due to asthma
   ☐ Loss of work/school days due to asthma
   ☐ Spirometry
   ☐ Peak flow
   ☐ Direct observation of inhaler technique
   ☐ Peak flow diary review
   ☐ Patient activity level
8) Do you have access to spirometry?
   ☐ No  ☐ Yes, where: ☐ In my office  ☐ Hospital  ☐ Specialized center
9) Do you use inhalers for patients with asthma?
   ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
10) Do you prescribe spacer devices with the metered dose inhalers (MDIs)?
    ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
11) Are you certain about the safety of inhaled corticosteroids.
    ☐ Yes ☐ No
12) What are the medications you prescribe for patients >5 years old with moderate persistent asthma?
    12.1 Oral β-agonist  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
    12.2 Inhaled β-agonist  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
    12.3 Theophylline  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
    12.4 Long acting β-agonist (LABA)  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
    12.5 Inhaled steroids  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
    12.6 Oral steroids  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
    12.7 Leukotriene antagonist  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
    12.8 Cromolyn or nedocromil  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
    12.9 Oral anti-histamines  ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
13) For a patient (>5 years of age) with daily symptoms that respond to three times daily short acting β-agonists as his or her only medication who is waking up more than twice a month with asthma symptoms, what would you do next? (Choose one item only)
    ☐ No change  ☐ Increase β-agonists  ☐ Add theophylline
    ☐ Add oral steroids  ☐ Add inhaled steroids  ☐ Add cromolyn
    ☐ Add long acting β-agonists  ☐ Add oral anti-histamine
    ☐ Add Montelukast or Zafirlukast
    ☐ Add inhaled steroids and Montelukast/Zafirlukast
    ☐ Add inhaled steroids and long acting β-agonist
    ☐ Add inhaled steroids and Montelukast/Zafirlukast and long acting β-agonist
    ☐ Other: _________________________________________________________
14) Do you use “practice guidelines” for the treatment of asthma?
☐ No
☐ Yes:
If yes, please specify

| Created by | Read | Heard |
|------------|------|-------|
| ☐ Global Initiative for Asthma (GINA) guideline
☐ National Asthma Education and Prevention Program (USA)
☐ International Consensus Report |

☐ Other: ____________________________________________

15) Have you attended a lecture on asthma in the past year?
☐ Yes ☐ No

16) Have you educated your patients about asthma?
☐ Yes ☐ No

Thank you for your cooperation.