

## The Role of FE<sub>NO</sub> in the Diagnosis and Control of Asthma. Expert Multidisciplinary Group Debate during the Asthma Meeting Point 2017<sup>☆</sup>



### Papel de la medición de la FE<sub>NO</sub> en el diagnóstico y control del asma. Debate del grupo multidisciplinar de expertos de la reunión Asma Meeting Point 2017

Dear Editor,

Measuring fractional exhaled nitric oxide (FE<sub>NO</sub>) is a non-invasive method for identifying allergic eosinophilic inflammation of the bronchi and activation of the IL-4/IL-13 pathway in the allergic asthma phenotype.<sup>1</sup> Its simplicity of use, immediate results, and reasonable cost have made it the procedure of choice among asthma specialists. However, the Global Initiative for Asthma (GINA)<sup>2</sup> and the Spanish Guidelines for the Management of Asthma (GEMA)<sup>3</sup> diverge in their positioning on this technique. Several

recent systematic reviews analyzing the efficacy of this technique have reported favorable results for diagnosis,<sup>4</sup> and partially favorable results for determining asthma control.<sup>5</sup> This evidence, far from settling the issue, has sparked further debate.

For this reason, a round table discussion on this topic was included in the program of the latest “Asthma Meeting Point” (AMP) conference in 2017. The AMP is a multidisciplinary meeting of asthma experts, the main aim of which is to discuss controversial issues in asthma or matters for which insufficient evidence is available. In total, 144 professionals participated in this meeting, including 87 (60.4%) pulmonologists, 40 (27.8%) allergists, 9 (6.2%) primary care practitioners, and 8 (5.6%) representatives from other areas (pediatrics, internal medicine, and nursing).

Before the meeting, a brief electronic survey on the opinions and attitudes of the attendees toward FE<sub>NO</sub> was conducted. It was completed by 79 professionals, and the results are listed in Table 1A. It was particularly interesting to note that whereas only 19.3% used the method to establish a diagnosis, and 16.7% used it to determine

**Table 1**

Opinion of Experts Attending the AMP-2017 Meeting on the Use of FE<sub>NO</sub> in the Diagnosis and Control of Asthma: A. Results of the Survey Completed Before the Meeting; and B. Results of the In-Person Vote Taken During the Meeting.

A. Results of the survey completed before the AMP-2017 meeting (n=79)	
1. Of all the patients you see in your outpatient consultations, what is the approximate proportion of asthma patients?	21–40%=49.2% 41–60%=30.8% 61–80%=20.0%
2. Indicate which of the following techniques you usually use in your clinic to confirm a diagnosis of asthma (check as many as necessary)	Spirometry with bronchodilator test=28.4% Nonspecific bronchial challenge=24.7% FE <sub>NO</sub> =19.3% PEF=17.3% Specific bronchial challenge=4.1% Inflammatory cell count in induced sputum=6.2%
3. What type of FE <sub>NO</sub> measuring device do you have in your clinic?	Chemiluminescence=36.4% Electrochemical=31.2% Both=9.1% None=23.4%
4. Do you believe that the measurement of FE <sub>NO</sub> is useful for confirming a diagnosis of asthma in cases with clinically suspected asthma, but in whom the standard complementary tests did not provide such confirmation?	Yes=77.3% No=22.7%
5. Indicate which of the following techniques you usually use in your clinic to establish the level of asthma control (check as many as necessary)	Spirometry at the time of the consultation=24.56% Conventional clinical interview=22.42% Nonspecific bronchial challenge=21.35% Measurement of FE <sub>NO</sub> =16.73% PEF=14.95%
6. Do you believe that FE <sub>NO</sub> , in addition to the frequency of symptoms/exacerbations and spirometric values, is useful for establishing the level of asthma control (current and future) in your patients?	Yes=82.9% No=17.1%
7. How often do you use FE <sub>NO</sub> in follow-up visits to establish the level of asthma control in your patients?	0%=25.0% <25%=25.0% 26–50%=20.2% 51–75%=10.7% 76–100%=19.0%
B. In-person vote taken during the AMP-2017 meeting (n=103)	
1. The measurement of FE <sub>NO</sub> can be a useful complementary tool in the diagnosis of asthma in symptomatic patients with inconclusive spirometry	Yes=95.2% No=1.9% Don't know (no opinion)=2.9%
2. The measurement of FE <sub>NO</sub> , combined with questionnaires and spirometry, can help determine asthma control (current and future risk)	Yes, always in all cases=55.3% Only in patients with allergic asthma=35% No=3.9% Don't know (no opinion)=5.8%
3. The measurement of FE <sub>NO</sub> is useful for determining adherence to anti-inflammatory treatment in patients with asthma	Yes=65.1% Only in some patients under strict supervision=12.6% No=15.5% Don't know (no opinion)=6.8%

AMP: Asthma Meeting Point; FE<sub>NO</sub>: fractional exhaled nitric oxide; PEF: peak expiratory flow.

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the level of control, 77.3% considered it a useful method for diagnosis and 82.9% for determining asthma control. During the meeting itself, an interactive discussion took place among the audience and 5 of the authors of this article (VP, BGC, LME, LPLL and JMO). Controversial aspects associated with FE<sub>NO</sub> and, primarily, the approach to different clinical cases associated with the usefulness of the technique in the diagnosis and control of asthma were debated. After this discussion, 3 key questions were put to the audience, with several options for response, on which the attendees voted *in situ* at the end of the meeting (Table 1B). The results were even more favorable than those of the earlier questionnaire: 95.2% of the group believed that FE<sub>NO</sub> was a useful complementary technique in asthma for diagnosis and 90.3% found it useful for determining control (55.3% “in all cases”; plus 35.5% “only in patients with allergic asthma”).

In short, the opinion of the multidisciplinary group of stakeholders and experts in asthma attending the AMP-2017 meeting was largely favorable to incorporating the measurement of FE<sub>NO</sub> in clinical practice. Until the role of this examination is definitively determined in new studies, the results of this discussion should perhaps be considered in future editions of clinical practice guidelines in asthma.

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## Does the Impact of Cough on Quality of Life in Bronchiectasis Depend on Prognosis?<sup>☆</sup>



### ¿Existe un mayor impacto de la tos en la calidad de vida según el pronóstico de bronquiectasias?

Dear Editor,

The Leicester Cough Questionnaire (LCQ) is a simple instrument comprising 19 questions that measure the impact of cough on quality of life in the last 2 weeks, in 3 domains: physical (8 items), psychological (7 items), and social (4 items). It has been validated in non-cystic fibrosis (non-CF) bronchiectasis (BE) in English by Murray et al.,<sup>1</sup> and in Spanish, a few years ago, by Muñoz et al.<sup>2</sup> No data have been published to date on how the LCQ relates with differences in sex or BE severity according to the FACED and EFACED indices, so we believed it would be of interest to explore these factors.

We conducted a study (Hospital de la Princesa Ethics Committee approval no. PI-828), in which 99 stable patients (no exacerbations for 3 weeks), with a diagnosis on high-resolution computed tomography (HRCT) of non-CF BE according to the criteria of Naidich et al.,<sup>3</sup> were included consecutively over a period of 4 months. The following variables were collected: age, sex, smoking habit, body mass index, dyspnea grade (according to the modified Medical Research Council scale), lung function, chronic bronchial infection (isolation of the same organism in 3 consecutive sputum samples

obtained at least 1 month apart), and possible etiology of BE, after completion of the tests recommended by the diagnostic algorithm of the SEPAR Guidelines.<sup>4</sup> BE was classified on HRCT as cylindrical or cystic, and by extent: localized if it affected 1 or 2 lobes, or diffuse if more (taking the lingula as an independent lobe). Patients were evaluated for respiratory exacerbations (need for antibiotic treatments due to increased respiratory symptoms) and hospitalizations for exacerbations in the last 2 years. BE severity was calculated using FACED and EFACED scores.<sup>5,6</sup>

We included 68 women and 31 men, mean age 66.95±15.0 years, with a mean LCQ score (15.67±4.34) indicating cough with a moderate impact on quality of life; mean FACED score: 2.89±1.36; and mean EFACED score: 3.24±1.53. In total, 42.4% and 53.5% were classified as mild; 46.5% and 41.4% as moderate; and 8.1% and 2.0% as severe, according to FACED and EFACED, respectively.

A significant difference was observed when LCQ was analyzed according to sex, with women obtaining worse scores in all domains (Table 1).

A weak-moderate negative correlation was found between EFACED and the total score and all domains of the LCQ, but not for FACED (Table 1). Although the impact of cough increased as BE severity increased, this trend was not significant (Table 1).

In the validation of the Spanish version of the LCQ by Muñoz et al.,<sup>2</sup> BE was classified by severity according to color of expectoration, bacterial colonization, type and extent of BE, volume of sputum, FEV<sub>1</sub>, and dyspnea. LCQ was associated with BE severity. In our study, we used the prognostic BE scales, and found a mild-moderate correlation, particularly with EFACED.<sup>5,6</sup> When analyzed by sex, cough was seen to have a greater impact on quality of life in women in all LCQ domains, most markedly in the psychological domain, while BE severity was similar among the sexes. Cough

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