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Original Article

External Assessment of the GEMA$_{2009}$ Recommendations by a Multidisciplinary Expert Panel on Asthma

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ABSTRACT

Objectives: To assess the level of agreement on the GEMA 2009 clinical recommendations by a Spanish expert panel on asthma.
Materials and methods: The study was divided into four stages: 1) establishment of a 9 member scientific committee (GEMA authors) for selection of GEMA recommendations to use in the survey; 2) formation of a panel of 74 professionals with expertise in this field (pulmonologists, allergists, family doctors, ear, nose and throat and paediatric specialists); 3) Delphi survey in two rounds, sent by mail, with intermediate processing of opinions and a report to the panel members; and 4) analysis and discussion of results for the Scientific Committee.
Results: Seventy four participants completed the two rounds of survey. During the first round, a consensus was reached in 49 out of 56 questions analysed. Following discussion by the panel, the consensus was increased to a total of 53 items in the survey. With respect to the remaining questions, Insufficient consensus was obtained on the rest of the questions, due to differing views between sub-specialists, or lack of criteria by most of the experts.
Conclusions: The external analysis by asthma experts from different specialities showed a high level of professional agreement with the GEMA 2009 recommendations in Spain (96.5%). The disagreement shown in three recommendations reflect the lack of a high level evidence. These issues represent areas of interest for future research.

Valoración externa de las recomendaciones de la GEMA$_{2009}$ por un panel multiprofesional de expertos en asma

Palabras clave:
Asma

RESUMEN

Objetivos: Valorar el grado de acuerdo de un panel de expertos en asma de diferentes especialidades con las recomendaciones que propone la Guía Española para el Manejo del Asma (GEMA) 2009.

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Guía Práctica Clínica
Consenso profesional
Delphi

Material y métodos: El estudio se efectuó en 4 fases: 1) constitución del comité científico formado por los 9 coordinadores de $GEMA_{2009}$, para la selección de las recomendaciones de la Guía que conforman el cuestionario Delphi del estudio (56 ítems); 2) selección de un panel estatal multicéntrico con 74 expertos en asma de todas las especialidades implicadas en la Guía (neumólogos, alergólogos, médicos de familia, otorrinolaringólogos, y especialistas de pediatría); 3) encuesta Delphi en 2 rondas (con valoración personal de cada ítem mediante escala Likert de 5 puntos), por correo electrónico, con informe a panelistas de resultados intermedios; y 4) análisis y discusión de resultados por el comité científico del proyecto.
Resultados: Se apreció un consenso de criterio en 49 de las 56 cuestiones analizadas ya en la primera ronda. Tras la interacción del panel, se lograron consensuar 53 ítems de la encuesta, en el sentido favorable al acuerdo del panel con las recomendaciones GEMA. En una de las cuestiones no consensuadas, sobre indicación de inmunoterapia en asma alérgica, se apreció una significativa disparidad de opinión entre especialidades. En otra, sobre las medidas de control ambiental en alergia a ácaros, se apreció una manifiesta oposición del panel (55%), y en la última, sobre la necesidad de cambiar de trabajo en pacientes con síndrome reactivo de disfunción de la vía aérea, se observó una ausencia significativa de criterio establecido en buena parte de los encuestados (40% expresan "ni de acuerdo ni en desacuerdo").
Conclusiones: La valoración externa por expertos en asma de diferentes especialidades constata un elevado nivel de acuerdo profesional con las recomendaciones formuladas en $GEMA_{2009}$ (93%). Probablemente el desacuerdo evidenciado en 3 de las recomendaciones reflejan la escasez de evidencias, o su gran variabilidad, para establecer recomendaciones consistentes. Estas cuestiones podrían representar áreas susceptibles de un mayor esfuerzo investigador futuro.

Introduction

A new updated version of GEMA (*Spanish acronym for Spanish Guidelines for Managing Asthma, 2009 edition*)[1] has been recently issued, a guide that outlines the latest advances in the diagnosis and treatment of asthmatic disease, renewing and updating the previos 2003 edition.[2] This is a clinical practice guideline, designed and developed to help Spanish health professional in the diagnosis and therapy of asthmatic patients. It is a practical tool that, with its concise and clear text, compiles a broad collection of clinical recommendations based on the available evidence at the time of publication. $GEMA_{2009}$ is an independent project, agreed upon by experts from various Spanish scientific societies involved in caring for this disease. It was developed with technical supervision from the Iberoamerican Cochrane Centre and with the explicit support of the Spanish Patients Forum, a formal organisation of those affected by the disease. For its technical quality and methodological rigour, the document has been included in the official catalogue of the *GuíaSalud* initiative (Clinical Practice Guidelines in the National Health System, Inter-territorial Council SNS).[3]

The drafting of GEMA involved 33 experts and 74 reviewers representing nine Spanish scientific societies from various specialities: SEPAR (Spanish Society of Pneumonology and Thoracic Surgery), SEAIC (Spanish Society of Allergology and Clinical Immunology), semFYC (Spanish Society of Family and Community Medicine), SEMERGEN (Spanish Society of Primary Care Physicians), SEMG (Spanish Society of General and Family Physicians), GRAP (Respiratory Group in Primary Care), SEICAP (Spanish Society of Clinical Immunology and Paediatric Allergology), SENP (Spanish Society of Paediatric Pulmonology) and SEORL (Spanish Society of Otolaryngology).

After the public presentation of $GEMA_{2009}$, the Executive Committee of $GEMA_{2009}$ implemented a wide dissemination and implementation strategy of the contents of $GEMA_{2009}$ to all involved specialties. In this context, this project aims to explore the personal opinions of a wide group of professional asthma experts from all over the country on the main issues that the guidelines analysed and included among the recommendations of their 2009 edition. The purpose of this initiative is to contrast and, when appropriate, verify the broadest possible professional endorsement of the guideliness, widening the circle of experts who know and support it with other professionals who did not directly participate in its drafting.

A modified Delphi method[4] has been used to determine the level of agreement on the key recommendations of $GEMA_{2009}$ by this new panel of experts proposed by the various Spanish scientific societies involved in asthma care. This structured technique for professional consensus, a variant of the original procedure developed by Dalkeyet et al. at the Rand Corporation,[5,6] maintains its principal advantages versus other alternative techniques (such as consensus conferences, nominal groups and unstructured meetings) and resolves some of its key disadvantages.[7]

This procedure allows us to understand and approach the professional opinion of very heterogeneous groups on a point of interest, perserving the anonymity of the panelists who are guaranteed to have sufficient time for individual reflexion and access to a controlled mechanism for interacting with other participants, which minimises the possible bias of internal influence. Among its disadvantages, the technique is not immune to the possibility of influence of its drivers (in the selection of an expert panel and in the discussion of results). To minimise these risks, the current study has been planned and co-directed by a multicentre research team from various backgrounds and interests, which has followed systematised and objectifiable procedures in the selection of panelists[8] and in the statistical analysis and interpretation of results.[9-13]

Material and Methods

Design

The modified Delphi method seeks the anonymus opinion of participants on the topic for discussion by means of a formal written survery sent by email. The survey was repeated in a second round after disseminating among the participants the group results of the first questionnaire and the open views and comments added by the panelists in their surveys. This way, the manifestly divergent views among the group can be reconsidered. The degree of dispersion in the final answers was analysed statistically to determine which issues had achieved a sufficient level of consensus within the panel of experts, whether in agreement or disagreement with each item presented.

The project was developed in four phases: 1) creation of a multi-disciplinary scientific committee responsible for the formulation of survey items, from the battery of professional criteria and clinical recommendations proposed in $GEMA_{2009}$; 2) creation of

a panel of expert asthma specialists representing different scientific societies involved in the development of $GEMA_{2009}$; 3) email survey in two rounds with intermediate processing of results and report for the panelists; and 4) collection, statistical analysis and discussion of conclusions by the scientific committee.

Questionnaire Development

The Scientific Committee for the project was formed by the nine official coordinators appointed by their respective societies for the Executive Committee of $GEMA_{2009}$ along with an independent member as a methodology advisor.

The Committee's work started from a first draft of the survey that comprehensively compiled the major clinical recommendations presented in the guidelines, for a total of 74 items. Each item is a consideration (affirmative or negative) that provides a professional criteria or a clinical recommendation on asthma from $GEMA_{2009}$. Through a process of successive revisions, the Committee members unanimously accepted the items considered most relevant from the point of view of clinical practice. After this process, the final version of the survey included 56 items classified into two age groups: asthma in adults (43 items) and childhood asthma (13 items).

The list of issues relating to asthma in adult patients were classified into 12 subject areas: diagnosis of asthma (4 items), diagnosis of allergy (2 items), classification of asthma in adults (5 items), maintenance treatment (12 items), other treatments (3 items), education (1 item), asthma exacerbations (3 items), rhinitis (4 items), asthma and pregnancy (1 item), hard-to-control asthma (4 items), work-related asthma (3 items) and vocal cord dysfunction (1 item). The questionnaire on childhood asthma was structured in four sections: diagnosis (3 items), classification of childhood asthma (2 items), treatment of childhood asthma (5 items) and evaluation and treatment of asthma exacerbations in children (3 items). The express descriptions of each item are shown in tables 1 and 2, just as they were presented to the panelists for their consideration.

For the assessment of the survey, a single ordinal Likert scale was proposed with five numeric response categories described by linguistic qualifiers: 1 = "completely agree with the item", 2 = "somewhat agree", 3 = "neither agree nor disagree (I do not have an opinion)", 4 = "somewhat disagree", 5 = "completely disagree with the item". After each item, the panelists were able to add open comments explaining their response. Questions left unanswered because the panelist considered themselves unqualified in the field were analysed as lost cases for statistical purposes.

Selection of Expert Panel

In response to the Scientific Committee's request, the members of the expert panel were proposed equally by each of the scientific societies participating in $GEMA_{2009}$, who were advised to use a "snowball" strategy in identifying and selecting their expert representatives, as proposed by Goodman and Coleman.[8] These societies were told that the only limiting condition for excluding possible candidates from participation in this study was direct or indirect collaboration in the drafting of $GEMA_{2009}$ (as an author, reviewer or any other type of involvement). It was also requested that candidates be excluded if they declared any type of conflict of interest in the development, diffusion and implemenetation of the guidelines.

Balanced representation was attempted (n = 20 subjects) of the four clinical specialties particularly involved in the care of asthmatic

Table 1
Criteria/recommendations of $GEMA_{2009}$ on adult asthma included in the project

Diagnosis of asthma	
1.	Diagnosis of asthma should be based on objective measurements of functional restriction
2.	In patients with symptoms suggestive of asthma, PEF variability of greater than 20% is diagnostic of asthma
3.	A high fraction of nitric oxide (FeNO) is suggestive of asthma in patients who have not used glucocorticoids, especially if associated with a reduced FEV_1
4.	Nonspecific bronchial provocation should be taken into account to rule out an asthma diagnosis
5.	In persistent asthma, evaluation of the potential role of aeroallergens through clinical assessment and skin prick tests or IgE is recommended
6.	It is important to base the diagnosis on agreement between the medical history and the diagnostic tests
Classification of adult asthma	
7.	The severity of the asthma is to be established at the start when the patient is not receiving treatment
8.	If the patient is already being treated, the severity is determined by the minimum requirements for maintenance therapy to achieve control
9.	The control must be evaluated periodically and treatment must be adjusted to achieve and maintain control
10.	Control has two basic components that should be identified: current control and future risk
11.	The level of control can be objectively assessed through validated symptom questionnaires (ACT, ACQ), pulmonary function and, in individual cases, by measuring inflammatory biomarkers
Maintenance treatment	
12.	In patients with symptoms of asthma, and in any of the therapeutic levels, the use of an on-demand short-acting β_2 adrenergic agonist is recommended for quick relief of these symptoms
13.	Short-acting β_2 adrenergic agonists administered some 10-15 minutes in advance are the drugs of choice to prevent bronchoconstriction induced by exercise
14.	The use of on-demand short-acting inhaled β_2 adrenergic agonists is recommended for treating intermittent asthma (level 1)
15.	The treatment of choice in persistent mild asthma (level 2) is an inhaled glucocorticoid used regularly at low doses
16.	Leukotriene receptor antagonists may be considered an alternative treatment in mild persistent asthma
17.	In persistent moderate asthma, the recommended treatment of choice is a combination of low (level 3) or medium doses (level 4) of a glucocorticoid and a long-acting inhaled β_2 adrenergic agonist
18.	In persistent moderate asthma, one may consider, as an alternative, low (level 3) or medium doses (level 4) of an inhaled glucocorticoid associated with a leukotriene receptor antagonist
19.	The combination of budesonide and formoterol can be used as a maintenance and an on-demand treatment
20.	For persistent severe asthma (level 5), the recommended treatment of choice is high doses of inhaled glucocorticoid in combination with a long-acting β_2 adrenergic agonist
21.	In patients with poorly-controlled severe allergic asthma, consider using omalizumab

Table 1 *(Continuation)*

22.	With poorly-controlled severe asthma, despite the use of high doses of inhaled glucocorticoids and a long-acting β_2 adrenergic agonistic (level 6) (with or without other maintenance drugs), it is necessary to consider the addition of oral glucocorticoids
23.	The use of spacer chambers avoids the problem of coordination between the pushing and the inspiring and improves the distribution and quantity of the drug that reaches the bronchial tree
Other treatments	
24.	For asthma allergic to dust mites, isolated environmental control measures are not recommended
25.	In allergic asthma that is well controlled with low or medium levels of treatment (levels 2-4), provided they have demonstrated IgE sensitisation against common aeroallergens that are clinically relevant and well standardised extracts are used, allergen immunotherapy is recommended
26.	Allergen immunotherapy must be prescribed by experienced specialists and administered in centres that have the basic means for immediately treating a possible adverse reaction
Education	
27.	It is recommended that asthma patients should be provided with a written action plan with the aim of early detection of asthma exacerbation and to establish measures for its quick remission
Asthma exacerbations	
28.	The assessment of any asthma exacerbation must include identifying signs and markers of a life-threatening attack and the use of objective measurements (PEF or spirometry) to quantify the degree of airflow obstruction (static assessment)
29.	For patients experiencing an asthma attack, consideration of the initial therapeutic response of the airflow obstruction when evaluating the plan to be followed (dynamic assessment) is recommended
30.	Furthermore, in the case of a moderate to severe exacerbation, early administration of systemic glucocorticoids and oxygen at the minimum concentration that provides an $SaO_2 > 90\%$ is recommended
Rhinitis	
31.	In order to confirm a diagnosis of allergic rhinitis, performing skin prick tests and/or determining specific serum IgE levels is recommended
32.	Faced with a diagnosis of asthma, it is advisable to investigate the presence of rhinitis (and vice versa) in order to carry out a joint diagnosis and treatment strategy
33.	Oral and topical nasal antihistamines along with topical nasal glucocorticoids are recommended for use in the drug treatment of allergic rhinitis
34.	Allergen-specific immunotherapy is recommended for properly selected allergic patients (both adults and children)
Specific circumstances asthma and pregnancy	
35.	Drugs used regularly (β_2 adrenergic agonists and inhaled glucocorticoids) are recommended for asthma maintenance treatment in pregnant women
Specific circumstances difficult-to-control asthma	
36.	Patients with difficult-to-control asthma (DCA) must receive regular check-ups from experienced health care personnel in specialist centres
37.	It is recommended that the diagnostic and therapeutic approach to DCA follow a protocol using decision algorithms, which sequentially set the manoeuvres and drugs to be used rationally, from least to most aggresive
38.	Recognising the DCA phenotype may bring about therapeutic advantages
39.	Treatment of DCA should not pursue absolute control of symptoms and therefore it is advisable to reach an agreement with the patient on a maximum tolerable level of asthmatic symptoms
Specific circumstances work-related asthma	
40.	The reference test for diagnosing immunological occupational asthma is the specific bronchial provocation test
41.	When treating occupational immunological asthma, completely removing exposure to the trigger is recommended
42.	With reactive airway dysfunction syndrome (RADS), if asthma control is achieved with or without medical treatment then changing jobs is not necessary
Specific circumstances vocal cord dysfunction	
43.	Diagnosis of vocal cord dysfunction is performed by means of transnasal fibre-optic laryngoscopy

patients (pulmonologists, allergists, family physicians and paediatric specialists) to which was added an ENT group. There were no relevant refusals to participate in the study, except in this last group, with the final panel consisting of 74 professionals of diverse origin with the following distribution: 19 allergists, 18 family physicians, 18 paediatric specialists (8 pneumo paediatricians and 9 allergy paediatricians), 17 pulmonologists and 3 ENTs. In all cases, those who refused to participate based their decision on problems with their professional agenda or personal circumstances unrelated to the Guide, its authors, or the scientific societies that endorse it. Annex 1 identifies these experts.

The fieldwork took place over six weeks between May and July 2009, using email as a means of distribution and collection of forms.

Analysis and Interpretation of Results

The answers to the first round of questionnaires were analysed by calculating the average values of scores for each item and their corresponding 95% confidence interval (95% CI). Items were considered agreed upon by the panel if the upper limit of the 95% CI was less than three (agreement by the panel with the statement) or those in which the lower limit of the 95% CI was higher than three (disagreement with the statement). The remaining items that included the value 3 in the 95% CI of the average were proposed for reconsideration by the panel members in the second Delphi round.

In the second round of the survey, detailed information was provided to the panelists on the responses of the group to these questions (through bar graphs with frequency distributions of each

Table 2
Criteria/recommendations of $GEMA_{2009}$ on childhood asthma included in the project

Asthma Control in Children	
1.	Spirometry with a bronchodilator test is recommended to confirm asthma diagnosis and objectively evaluate asthma severity in all children able to cooperate properly
2.	Periodic spirometries should be performed at least once a year on children with asthma who require continuous treatment
3.	FeNO levels should be taken into account when diagnosing and monitoring asthma in children
Classification of Asthma in Children	
4.	A child's asthma should be classified before treatment has started
5.	In order to properly classify a child's asthma as well as its severity, it is important to identify the precipitating factors and establish the degree of control
Treatment for Childhood Asthma	
6.	Inhaled glucocorticoids are recommended for use as first-line treatment for controlling persistent asthma in children of any age
7.	Long-acting β_2 adrenergic agonists should be considered for children if these drugs are associated with an inhaled glucocorticoid
8.	Children with persistent moderate asthma should begin treatment with moderate doses of inhaled glucocorticoids and then reduce the dosage once the asthma is under control
9.	As an alternative, treatment can be started with a combination of low doses of inhaled glucocorticoids along with an antileukotriene for children under four years of age or a long-acting β_2 adrenergic agonist for children over four years
10.	When treating children with allergic asthma, one should consider using immunotherapy as long biologically standardised extracts are used and the patients have been properly selected
Evaluation and Treatment of Exacerbations in Children	
11.	High doses of short-acting β_2 adrenergic agonists that are administered early and repeatedly are recommended as first-line treatment for asthma attacks
12.	When treating a mild to moderate asthma attack, the use of a pressurised inhaler with a spacer is recommended
13.	For moderate to severe attacks, the prompt use of a systemic glucocorticoid is recommended

response option) and the comments and clarifications in open text provided by each participant were transcribed. After reviewing this information, the panelists re-evaluated their own scores for each item not agreed upon in the first round. To finish up, identical criteria to those of the first round were applied to discriminate the items that were definitively agreed upon from those for which a unified set of criteria could not be created.

For comparison, the more extreme the average score of an item (closest to the value 1 or to 5), the more manifest the consensus achieved, either in the agreement or disagreement, respectively, on the statement expressed in each item. Furthermore, the narrower the confidence interval range, the greater the consensus found between the views of the group. The items on which consensus was not achieved after completing the above process were analysed descriptively in order to distinguish those in which there is a heterogeneity of opinion among the panelists from those others in which the majority of the group recognises not having a specific opion on the matter (option = 3).

Although this analysis methodology is well established[9,10] has been used in similar previous studies,[4,11,12] the resulting consensus was verified using more demanding alternative statistical criteria[13] used by other authors in studies that used the same rating scales.[14,15] These criteria included a coefficient of variation less than 0.3, an average score of less than 2.5 or greater than 3.5, the sum of majority responses greater than 70% of total responses (1 + 2 or 4 + 5, respectively, for agreement or disagreement) and a medium different from the central point (3).

Results

The 74 practitioners who agreed to participate in the project completed two rounds of evaluation. In the first round, consensus was reached in 49 of the 56 statements analysed, according to the pre-established evaluation criteria. After the panelists had considered the results, another four items from the seven situations re-evaluated in the second round were rescued by consensus, until the panel reached a 94.6% consensus on the proposed questionnaire. All items agreed upon were done so in expert agreement with those proposed in the $GEMA_{2009}$. In the three remaining items (5.3% of the questionnaire), a unanimous consensus could not be achieved among the members of the panel, either due to disparity of professional opinion (item 24 and 25) or due to lack of clearly established opinion in a significant fraction of the participants (item 42).

Figure 1 (recommendations for adults) and 2 (paediatric recommendations) summarise the consensus reached after the two rounds of the survey, graphically representing the statistics corresponding to each item of the questionnaire (mean and 95% CI of the 1-5 scores for the entire panel). In both figures, one can visually identify the significant differences of opinion between items by the lack of overlap in their respective 95% CI. Non-consensus items are marked in a different colour.

Items 24, 25 and 42 from the list (tables 1 and 2 show the explicit description of each item) reflect the recommendations of $GEMA_{2009}$ upon which the panel of experts did not reach consensus. Table 3 lists the statistical parameters by which, in each case, group consensus was ruled out. Table 4 describes the differences in points of view between the representatives of the different specialties with regard to the three non-consensus recommendations and evaluates the possible significance of the observed differences in relation to the specialty.

For this analysis, the experts of each specialty were grouped by their core discipline (pulmonology or allergy) after checking the homogeneity of their opinions independent of their dedication to practicing care of children or of adult patients. This criterion was established after verifying the absence of distributional differences in the location and form of responses to the items referred (24, 25 and 42) between paedriatric and adult experts of each core speciality, through corresponding Kruskal-Wallis H-tests (in all cases, significance values were $p > 0.05$). These results do not rule out a null hypothesis test (that both samples of subspecialists come from the same theoretical core population that share the same professional opinion on the above recommendations) and legitimise the described grouping, increasing the sample size of the comparison groups and the strength of subsequent analysis.

Although a majority of panelists surveyed disagreed with item 24 ("*For asthma allergic to dust mites, isolated environmental control*

Table 3
Criteria used in assessing the recommendations on which sufficient professional consensus was not reached

Recommendation	Consensus criteria (statistics and interpretation applied)									
	95% CI Limits		Mean		Median		% responses options 1 + 2		Coefficient of variation	
	Value	Meets criterion	Value	Meets criterion	Value	Meets criterion	Value (%)	Meets criterion	Value	Meets criterion
Item 24	2.97-3.54	No	3.25	No	4	Yes	33.8	No	0.36	No
Item 25	1.83-2.49	Yes	2.16	Yes	2	Yes	72.8	Yes	0.66	No
Item 42	2.28-2.75	Yes	2.51	No	3	No	48.5	No	0.37	No

CI indicates confidence intervale.

measures are not recommended"), a detailed analysis of the distribution of responses verifies the bimodal distribution of the expert opinion on the question (55% against, 34% in favour). To assess whether this circumstance is due to possible differences in opinion between specialties, a non-parametric Kruskal-Wallis test was performed on the scores of each subgroup. Although the percentage of pulmonologists in favour of this recommendation is somewhat greater than that of other specialties, the test result ($p = 0.082$) does not allow for such a hypothesis (table 4).

With regard to item 25 ("In allergic asthma that is well controlled with low or medium levels of treatment [levels 2-4], provided they have demonstrated IgE sensitisation against common aeroallergens, which are clinically relevant and well standardised extracts are used, allergen immunotherapy is recommended"), there is a clear majority of panelists in favour of the recommendation (72.8%). However, the coefficient of variation of the scores, as a dimensionless measure of the dispersion of the answers of the respondents, shows an excess of heterogeneity in the panel. In this instance, a test of the median ($p = 0.001$) proves that 100% of the allergists and ENT provide responses less than or equal to the median value of the distribution (2), expressing clear agreement with the item, while half of the family physicians and pulmonologists are above this median with scores of 4 or 5 (in manifest disagreement with the item).

A non-parameteric Kruskal-Wallis analysis confirms the existence of a differential criterion between the two groups of specialists ($p = 0.0001$) on the recommendation. The analysis of the distribution of panel responses on item 42 ("With reactive airway dysfunction syndrome (RADS), if asthma control is achieved with or without medical treatment then changing jobs is not necessary") verifies that although the majority of experts surveyed (48.5%) expresses agreement with the recommendation, consensus is not reached because the other 40% of the panel stated that they did not have an established personal opinion about the issue (score 3 = neither agree nor disagree). In this case, there were no apparent differences in the orientation of views between specialties on the subject (Kruskal-Wallis test, $p = 0.17$).

Discussion

The external assessment by asthma experts of various specialties who were a part of the state-wide multi-centre panel of this study indicated a high level of agreement with the majority of the clinical recommendations contained in $GEMA_{2009}$ (94.6%) and endorsed the work of collecting, interpreting and synthesising the literature by the authors of the guidelines. It should be noted that the vast majority of these recommendations achieved consensus in the first round of the survey and that the average score of responses from the experts for each of the items was around 1.5 (between "completely agree" and "somewhat agree"), as seen in figures 1 and 2, showing that the respondents were clearly in line with the contents of the $GEMA_{2009}$ guidelines. Given these results, it seems appropriate to interpret them as a practically unanimous endorsement of the contents of the 2009 edition of the guide by the key practitioners of each of the professional groups responsible for its implementation in clinical practice (all recognised experts, selected by their own scientific societies).

The concordance of opinion of the panelists participating in this study is higher than that usually observed in other projects of similar methodology.[4,11,12] Although the legitimacy of such a comparison is questionable since the ability to muster consensus depends on each study (according to the heterogeneity of the professional panel and the degree of controversy in the subject for debate), it should be noted that the results of this project have been achieved with a multi-disciplinary group with different interests and care responsibilities.

Indeed, a core value of the study is the integration of knowledge and clinical experience of asthma experts from various specialised backgrounds and geographic locations. All of them were explicitly told that when it came time to agree or disagree with the recommendations in the $GEMA_{2009}$ guidelines that they should try to express their professional conviction on the adequacy and applicability of each recommendation, taking into account their particular experience and direct knowledge of the health environment and the expectations of their patients. In this sense, the consensus conclusions add a judgment based on individual competency and skill from experts (i.e., their clinical experience) to the synthesis of the best scientific evidence proposed by the guide. This integrates the two complementary elements required for the development of a truly evidence-based medicine, according to the original formulation of Sackett.[16]

Additionally, if the precautions taken for the selection of study participants are considered sufficient, the participating panellists may be considered as a representative sample of the theoretical population of expert asthma physicians from different specialties who exist in the Spanish health system. In this case, the results achieved could be construed as an general endorsement of the $GEMA_{2009}$ proposals by these collective experts. This apect, besides being a theoretical endorsement of the guidelines, can be considered a significant contribution to the dissemination and monitoring by the $GEMA_{2009}$ health professionals. Among the many possible reasons put forward as responsible for the poor adherence to clinical practice guidelines are the different criteria and standards of practice between specialties, which leads to an excessive variability of practice that fosters confusion and leads to a lower implementation of the recommendations. In the end, all of these circumstances contribute to deficient asthma control of asthma in those who suffer from it.[17]

The only three non-consensus recommendations in the study indicate certain aspects of clinical practice in asthma where there seems to be disparity of opinion among the participating specialists. The situation undoubtedly is related to the absence of solid scientific evidence on these issues or with the existence of controversy between different sources. These circumstances make establishing consistent and widely accepted recommendations in these sections questionable at this time. In any case, these controversial recommendations represent areas that are open to further research efforts whose results can be used as scientific evidence for proposing new recommendations that can be widely adopted by all groups of experts.

Table 4
Differences of opinion among specialties in the recommendations on which no professional consensus was reached by the panel

Recommendation	% of specialists who expressed each opinion on the recommendation[a]										p[b]
	Pulmonologists			Primary care			Allergists			ENT			
	Agree	Neither agree nor disagree	Disagree	Agree	Neither agree nor disagree	Disagree	Agree	Neither agree nor disagree	Disagree	Agree	Neither agree nor disagree	Disagree	
Item 24	33.3	16.7	50	26.6	0	70.3	29.2	12.4	58.4	0	0	100	0.082
Item 25	52	0	48	50	0	50	100	0	0	100	0	0	0.0001
Item 42	56.5	34.8	8.7	20	66.7	13.3	47.8	39.1	13	100	0	0	0.15

[a]The % indicated in each box groups the panelists by their opinions in the following categories: "Agree": scores 1 or 2; "Neither agree nor disagree": score 3; "Disagree": score 4 or 5.
[b]The p-value in the Kruskal-Wallis H-Test that contrasts the hypothesis of absence of distributional differences in the location and form of the responses of panelists from different specialties ($p < 0.05$ identifies significant differences between specialists).

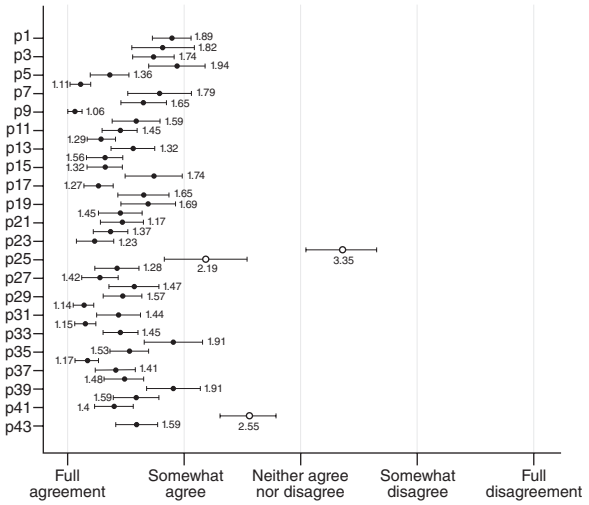

Figure 1. Overall results (all specialties): average values and 95% CI of panel scores for the GEMA recommendations on asthma in adults (in red, the items on which there was insufficient group consensus of opinion).

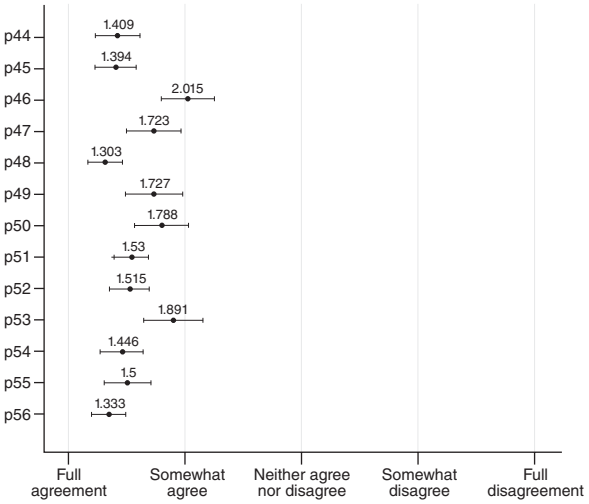

Figure 2. Overall results (all specialties): average values and 95% CI of panel scores for the GEMA recommendations on asthma in children.

The lack of agreement found on item 24 that stated the recommendation "*For asthma allergic to dust mites, isolated environmental control measures are not recommended*" must be assessed in a changing scientific context that explains, in part, the division of opinion. Traditionally, patients with demonstrated allergy to dust mites have been advised to follow specific domestic avoidance behavior (mattress covers, use of acaricides, etc.) Nevertheless, recent meta-analyses whose aim was to determine the efficacy of this action, found that it was low for rhinitis[18] and non-existence for asthma[19] for the sensitised patients. These findings have generated great controversy in the specialised literature with conflicting positions between the opponents[20] and the supporters[21] of mite avoidance. Some authors have questioned the appropriateness and heterogeneity of the study designs included in the meta-analysis and, as a result, the scope of the findings.[21] However, other studies with targeted combined interventions on different household allergens provided significant levels of clincal efficacy.[22] It is possible that new prospective studies are needed that are properly designed for responding reliably to the question at hand. The observation in our study of a bimodal distribution of the positioning of the expects

regarding this recommendation does no more than reflect the controversy over this issue, even in our area. Although there seems to be a greater rejection of the statement among allergists (who would be more supportive of environmental control measures), the perceived differences among the specialties was inconclusive.

With regard to item 25 ("In allergic asthma that is well controlled with low or medium levels of treatment [levels 2-4], provided they have demonstrated IgE sensitisation against common aeroallergens, which are clinically relevant and well standardised extracts are used, allergen immunotherapy is recommended"), although the group is largely in agreement with the recommendation, the criterion is not sufficiently unanimous to allow considering having reached a strict consensus (not all of the criteria detailed in the study methodology was met). In this instance, we can identify a clear differential criterion between specialists, given that it is a universally accepted practice among allergists and otolaryngologists, while it is openly rejected by half of the pulmonologists and primary care physicians. This apparent diversity of opinion expresses the scientific controversy that still exists about the role of immunotherapy in the treatment of asthma.

The lack of consensus noted in item 42 ("With reactive airway dysfunction syndrome (RADS), if asthma control is achieved with or without medical treatment then changing jobs is not necessary"), largely motivated by the fact that 40% of those interviewed chose option 3 ("neither agree nor disagree"), may relate to the special character of the syndrome, which is essentially relegated to the realm of professionals familiar with work-related asthma. The analysis of the results by speciality group seems to suggest that primary care physicians have a less defined criterion on the workplace issue than the rest of the specialties although no real signifiance could be established for this trend.

On the positive side of the study results, we must highlight the recommendations that achieved almost complete unanimity among those interviewed, with average responses close to 1 ("full agreement"). Among these ratings, those observed for items 6, 9, 30, 32, 36 and 48 reflect the triumph of relatively new concepts about the disease, such as the classification predominance of the concept of control both in adults (item 9) and in children (item 48) and the importance of the role of rhinitis associated with asthma (item 32).

In general, the $GEMA_{2009}$ guidelines show a high level of agreement between Spanish experts from various medical specialties on the diagnostic and therapeutic handling of asthma. The clinical recommendations created in these guidelines should be considered indications for clinical practice supported by solid evidence and widely endorsed by clinical experience. Practictioners involved in the handling of this disease can accept these guidelines with confidence as current directions from the time the guidelines are published until the emergence of new scientific data that justifies its future revision.

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ANNEX 1. Alphabetical list of the participating panelist grouped by scientific society taking part in $GEMA_{2009}$

SEPAR

Ramón Agüero Balbín
Francisco Javier Álvarez Gutiérrez
Santiago Bardagí Forns
Teresa Bazús González
José Antonio Castillo Vizuete
Carolina Cisneros Serrano
Concepción Díaz Sánchez
Borja García-Cosío Piqueras
José María Ignacio García
María Teresa Luengo Planas
Eva Martínez Moragón
Carlos Melero Moreno
Concha Pellicer Ciscar
Miguel Perpiñá Tordera
Alfons Torrego Fernández
Héctor Verea Hernando
Carlos Villasante Fernández-Montes
Isabel Urrutia Landa

SEAIC

M José Álvarez Puebla
Ignacio Antepara Ercoreta
Pilar Barranco Sanz
Victoria Cardona Dahl
Teresa Carrillo Díaz
Ignacio Dávila González
Julio Delgado Romero
Javier Domínguez Ortega
Valentina Gutiérrez Vall de Cabres
Dolores Hernández Fernández de Rojas
Miguel Hinojosa Macías
Carmen Moreno Aguilar
Rosa María Muñoz Cano
Pedro Ojeda Fernández
Joaquín Quiralte Enriquez
Mercedes Rodríguez Rodríguez
Joaquín Sastre Domínguez
José María Vega Chicote
Carmen Vidal Pan

SENP

Anselmo De Andrés Martín
Amparo Escribano Montaner
M Luz García García
Luis García Marcos
Eduardo González Pérez-Yarza
Antonio Moreno Galdó
Conrado Reverte Bover
José Valverde Molina

SEICAP

Manuel Boquete Paris
Luis Echeverria Zudaire
Jesús Garde Garde
Marcel Ibero Iborra
Antonio Martínez Jimeno
Antonio Martorell Aragonés
Luis Moral Gil
Carlos Santana Rodríguez

SEMERGEN

Rafael Carrasco Alonso Matía
Eduardo Carrasco
Ramón González Correales
María Luisa López-Díaz Ufano
José Ignacio Prieto Romo

SEMFYC

Dolores Bello Izquierdo
Juan Enrique Cimas Hernando
Ana Morán Rodríguez
Álvaro Pérez Martín
José Ignacio Sánchez González

GRAP

Karlos Naberan Toña
Sara Núñez Palomo
Carlos Pardos Martínez
Miguel Román Rodríguez
Miguel Solís De Dios

SEMG

Manuel Devesa Muñiz
Moisés Robledo del Corro
Juan Antonio Sanz Pérez

ORL

Juan Ramón Monserrat Gili
Adolfo Sarandeses García
Manuel Tomás Barberán

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