

How pediatricians in Spain manage the first acute wheezing episode in an atopic infant. Results from the TRAP study

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ABSTRACT

Background: Although the treatment of asthma has been addressed in several guidelines, the management of the first acute wheezing episode in infants has not often been evaluated. We surveyed practicing pediatricians in Spain about the treatment they would provide in a simulated case.

Material and methods: A random sample of 3000 pediatricians and physicians who normally treated children was surveyed. The questionnaire inquired about how they would treat a first mild-to-moderate wheezing attack in a 5-month-old boy with a personal and family history of allergy. Pediatricians were asked about their professional background.

Results: A total of 2347 questionnaires were returned with useful data (78.2 %). Most (90.4 %) of the pediatricians would use a short-acting beta2-agonist (SABA) via a metered-dose inhaler with a spacer and a face mask or nebulizer. However, only 34.5 % chose a SABA alone; 31.3 % added an oral steroid and 27.6 % added an inhaled corticosteroid (ICS). The factors associated with the use of ICS in

the acute attack were: (1) lack of specific training in pediatrics (OR 1.45; 1.12-1.85) and (2) primary care health center setting (OR 1.31; 1.01-1.69) or rural setting (OR 1.28; 1.01-1.66). Forty-four percent did not recommend any follow-up treatment while 20.7 % prescribed ICS as maintenance therapy. The factors related to this decision were the same as those described above.

Conclusions: The management of a first wheezing episode seems to meet published guidelines among Spanish pediatricians with formal training in pediatrics and in those who work in a hospital setting or in urban areas.

Key words: First acute wheezing episode. Asthma. Pediatricians. Approach. Management.

INTRODUCTION

While treatment of asthma has been extensively addressed in national¹ and international guidelines²⁻⁴, the management of the first acute wheezing episode in infants has not been studied in detail. Wheezing in infancy is common and its natural history varies, but is beginning to be better understood. There are at least two different kinds of wheezing disorders at this age: (1) wheezing due to a lower respiratory tract infection in a non-atopic infant and (2) wheezing in the atopic infant⁴⁻⁷. We developed an "asthma predictive index" in order to identify those wheezy infants who are at high risk of developing asthma at

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school years⁵. However many pediatricians have to manage the first episode of wheezing in infants when asthma medications could be less effective and when a specific diagnosis of asthma is difficult to establish. In many countries the first wheezing episode in infancy, usually associated with a viral infection and often respiratory syncytial virus is called "bronchiolitis" to which the therapeutic approach may be different⁸. Although the pathophysiology of asthma is the same in the infant and in the adult², the efficacy of the short acting beta 2 agonists (SABA) on the infant lung have been subject to debate. Whereas early studies concluded that these drugs were ineffective in this age group⁹⁻¹¹, more recent controlled clinical trials have demonstrated significant bronchodilation and also clinical benefits when administered either alone¹²⁻¹⁴, even in infants with a first episode of wheeze¹⁵⁻¹⁷, or in combination with corticosteroids¹⁸. Thus, it seems that beta 2 receptors are present at birth and are functionally similar to those of the older child².

Probably the most useful guideline for treating acute episodes of wheeze in the infant is the Third International Pediatric Consensus Statement on the Management of Childhood Asthma⁴. Here, the acute episode is divided into mild (cough and audible wheezing without respiratory distress); moderate (wheezing, plus use of accessory muscles and a slight increase of the respiratory rate); and severe (cyanosis, severe distress, intercostal and rib cage retraction, or without the presence of obvious wheezing). Specific treatment options are advised for each stage. Very recently, the British Thoracic Society¹⁹ published a similar approach.

In this study we developed a questionnaire regarding a simulated case of a first acute, mild to moderate wheezing episode in an atopic infant. We have then used this case study to survey a large sample of Spanish pediatricians about their approach to treatment of such a case.

MATERIAL AND METHODS

Questionnaire

A random sample of 3000 pediatricians (about half of all Spanish pediatricians) was surveyed using an asthma questionnaire developed to establish how they diagnose and treat asthma in children ("Tratamiento y Recursos en el Asma Pediátrica", TRAP study). The questionnaire was designed by the Spanish Pediatric Asthma Study Group including representatives of all the Spanish Pediatric Societies that have any relationship with asthma.

The questionnaire was divided in two parts. The first part, "Asthma Questionnaire", included questions related to a specific asthma scenario in which the pediatrician indicated his or her management plan for that clinical situation (see appendix for the specific asthma scenario and questions used for the present study). The second part was the "Demographic Questionnaire" and contained questions about the age, sex, training in pediatrics, years of practice in the specialty, type of health setting where he/she worked (hospital or primary care center), area of work (rural or urban), province, if they had any special interest in asthma (yes or no) and if they were working in a specific pediatric subspecialty. No personal identification data was asked in any of the questionnaires. The questionnaires were distributed by pharmaceutical company representatives and collected within two weeks. They were distributed by representatives of a pharmaceutical company covering all of Spain. The 153 representatives who distributed the questionnaires could easily reach 3,000 pediatricians in that short time. No instructions were given about what specific pediatrician should be contacted. It is important to mention that the participating pharmaceutical representatives specialized not only in asthma medications, but also other drugs used in pediatric general practice, such as antibiotics. The only instruction given to representatives was to deliver all questionnaires given as soon as possible.

Data analysis

The relationship between the demographic variables of the pediatricians and the drugs chosen for treatment were assessed by means of Pearson's Chi-squared test expressing the results either in percentages or in odds ratios. The specific associations were established using the typified residuals for each cell. The age of the pediatricians was separated into two different groups: 36 to 55 years and those above or below these ages. As an average, in Spain a pediatrician ends his/her residence by the age of 30, so 5 years should be enough time to acquire adequate non-supervised experience. We chose 55 years for the upper age limit to include the 20 most productive years of a professional life. The younger ones were arbitrarily considered less experienced and the older ones less up to date in the current concepts of diagnosis and treatment of asthma. The two main ways of training in pediatric in Spain are the "pediatric residence" (present system, requiring four years of formal academic training in pediatric) and the "non-residential pediatric speciality" (previous system, which required attendance at regular classes for two years

together with supervised work in a pediatric setting—either in a hospital or in an outpatient clinic). The provinces were grouped into coastal and inland provinces due to their different climate (humid or dry, respectively) and to the fact that epidemiological studies have shown that asthma is more prevalent and severe in the coastal areas than in the inland¹⁹.

A logistic regression was also performed to evaluate which demographic variables were the most important for the choice of a specific drug or combination of drugs. Variables included in the model were: age group, sex, type of pediatric training, type of health setting, area of work and special interest in asthma. Odds ratios (OR) calculated in the logistic regression were considered as adjusted ORs.

RESULTS

Among the 3,000 pediatricians at least one of the two questionnaires was recovered in 2773 individuals (2619 “demographic questionnaires” and 2501 “asthma questionnaires”). 2347 pediatricians returned both questionnaires, giving a response rate of 78.2 %. 272 individuals provided demographic data, but no asthma questionnaire and were considered non-respondents. There were no significant differences between respondents and non-respondents in terms of age, gender, method of training, years in the specialty, place of work (data not shown), however non-respondents had less special interest in asthma than the respondents (71 % vs. 80 %, respectively, $p = 0.002$).

Only 5.5 % of the pediatricians reported that they would refer the child to the emergency department (ED) of a hospital. This percentage was significantly higher among pediatricians working in hospitals than among those working in primary care settings (10.3 % vs. 4.4 %, respectively, $p < 0.001$). Significantly more pediatricians working in the urban as compared to rural areas indicated that they would send the child to the ED (6.5 % vs. 3.6 %, respectively, $p = 0.01$). No other factors (gender, special interest in asthma, age group or training in pediatrics) influenced the decision to send the child to the ED. Pediatricians working in a coastal province were significantly more reluctant to send the child to the ED than those working inland (4.4 % vs. 7.5 %, $p = 0.002$). Including together all these variables in a logistic regression model did not affect these bivariate results (data not shown).

90.4 % of the pediatricians (2122/2347) reported they would use a SABA via a MDI with a spacer and a face mask or a nebulizer to improve the respiratory status of the child in their office. Only 10 pediatri-

Table I
Frequency of the different drugs combinations reported by pediatricians to treat acutely the first wheezing attack in a 5-months-old infant

Treatment	N	%*
Short acting beta 2 agonists alone	733	31.2
Short acting beta 2 agonists + Inhaled corticosteroids	314	13.4
Short acting beta 2 agonists + Oral corticosteroids	444	18.9
Short acting beta 2 agonists + Parenteral corticosteroids	11	0.5
Short acting beta 2 agonists + Oral & Inhaled corticosteroids	152	6.5
Short acting beta 2 agonists + Ipratropium bromide	185	7.9
Short acting beta 2 agonists + Ipratropium bromide + Inhaled corticosteroids	73	3.1
Short acting beta 2 agonists + Ipratropium bromide + Oral corticosteroids	22	0.9
Short acting beta 2 agonists + Ipratropium bromide + Oral & Inhaled corticosteroids	47	2.0
Would not use a short beta 2 agonist	80	3.4
Other drugs or possible combinations	286	12.1

*The denominator in this table (n = 2347) is the total number of pediatricians who returned both demographic and asthma questionnaires.

cians (0.4 %) said they would use an inhaled SABA without a chamber or a spacer. The interval frequency of SABA reported was every 4h in 23.9 % of cases and every 6 h in 29.3 %. Fifteen percent preferred to use inhaled SABA on demand (prn), and 14.7 % would administer a new dose after 30 minutes. Only 3.4 % of pediatricians would not use a SABA for the acute wheezing episode.

The main drugs or combination of drugs chosen by pediatricians to treat the acute attack are listed in table I. Specifically, of those who chose SABA (n = 2122), 733/2122 (34.5 %) chose SABA alone, 665/2122 (31.3 %) chose SABA in combination with an oral steroid (OCS), and 586/2122 (27.6 %) in combination with an inhaled steroid (ICS). Only a small percentage of pediatricians (7.9 %) would add ipratropium bromide (IB) to SABA. Antibiotics were chosen by only 1 % of the pediatricians.

Table II shows significant associations between the different treatment combinations for the acute wheezing attack and those demographic factors we evaluated, as calculated by logistic regression model. After adjusting for the demographic variables, the independent factors associated with use of SABA alone for treatment of acute wheezing was a “pediatric residence” (OR: 1.54, 95 % CI: 1.11-2.13), and a tendency were found in those who working in a hospital setting (OR: 1.27, 95 % CI: 0.88-1.83). Pediatricians who worked at the hospital and were males were independently more prone to add IB to the

Table II
Pediatrician's characteristics that related significantly or near significantly to the use of different therapeutic combinations to treat the acute wheezing attack

Therapeutic combination	Variable	Crude OR	95 % CI	Adjusted OR	95 % CI
SABA only	Male	0.77	0.64-0.92	0.95	0.71-1.27
	Pediatric residence	1.63	1.23-2.09	1.54	1.11-2.13
	Hospital setting	1.21	0.98-1.48	1.27	0.88-1.83
	Urban area	1.30	1.05-1.61	1.02	0.72-1.42
	Coastal province	0.83	0.70-0.99	0.86	0.70-1.05
SABA + IB	Male	0.74	0.52-1.05	1.67	1.12-2.50
	Hospital setting	1.96	1.40-2.77	2.79	1.85-4.19
	More than 55 or less than 35 years of age	0.64	0.42-0.97	0.58	0.36-0.94
ICS	Non-residential pediatric speciality	1.41	1.1-1.75	1.45	1.12-1.85
	Primary care health setting	1.45	1.15-1.78	1.31	1.01-1.69
	Rural area	1.33	1.09-1.64	1.28	1.01-1.66
	Coastal province	0.76	0.63-0.91	0.74	0.60-0.93
OCS	Rural setting	1.25	1.03-1.51	1.20	0.96-1.51
	Coastal province	1.29	1.09-1.54	1.24	1.01-1.51

SABA: inhaled short acting beta2 agonist; ICS: inhaled corticosteroid; OCS: oral corticosteroid; IB: ipratropium bromide.

Table III
Frequency of the different treatment combinations reported by pediatricians as maintenance therapy after the first wheezing attack in a 5-months-old infant

Treatment	N	%
No treatment	1038	44.2
Short acting beta 2 agonists	96	4.1
Inhaled corticosteroids	485	20.7
Oral corticosteroids	45	1.9
Cromoglycate	17	0.7
Ketotifen	34	1.4
Antileukotrienes	4	0.2
Ipratropium bromide	17	0.7
Antibiotics	2	0.1
Inhaled corticosteroids + Long acting beta 2 agonists	43	1.8
Inhaled corticosteroids + Short acting beta 2 agonists	143	6.1
Oral corticosteroids + Short acting beta 2 agonists	22	0.9
Cromoglycate + Short acting beta 2 agonists	2	0.1
Ketotifen + Short acting beta 2 agonists	2	0.1
Inhaled corticosteroids + Long acting beta 2 agonists + Short acting beta 2 agonists	3	0.1
Antibiotics + Short acting beta 2 agonists	3	0.1
Cromoglycate + ketotifen	9	0.4
Inhaled corticosteroids + Oral corticosteroids	36	1.5
Other possible combinations	346	14.7

*The denominator in this table (n = 2347) is the total number of pediatricians who returned both demographic and asthma questionnaires.

SABA therapy, while those more than 55 or less than 35 years of age were reluctant to add it. The use of ICS in the treatment of the acute attack was more frequent among "non-residential pediatric speciality" physicians; those worked in primary care settings and those who work in a rural area. In contrast, those working in a coastal province used less ICS, but more often OCS in the acute wheezing attack.

After the acute attack, 51.8 % of the pediatricians stated that they would see the child again on the following day; 24.6 % indicated that they would visit the child later the same day. Only 15.6 % postponed re-assessment to the following week. The majority (77 %) of pediatricians would not refer the child to a consultant allergist or pulmonologist. Among those who would refer an allergist was preferred over a pulmonologist (4.3 % vs. 2.3 %, respectively).

For maintenance therapy after the wheezing attack, 44.2 % would not use any treatment. However, 20.7 % would use ICS alone for follow-up management and 6.1 % would use a SABA plus an ICS (table III). Antibiotics were recommended by only 1.2 % of pediatricians; ketotifen was used by 4.7 % and oral theophylline by 12 %. 64.4 % of pediatricians would use 1 mg/Kg/d of OCS and 14.5 % would recommend 2mg/kg/d for acute wheezing, however 11.6 % did not answer this question. The preferred duration for the OCS treatment was ≥ 3 to < 5 days in 59 % of the pediatricians, > 1 to < 3 days in 14.4 %

Table IV

Pediatrician's characteristics that related significantly to the use of different therapeutic combinations as a maintenance treatment after a first wheezing attack in an infant

Therap. Combination	Variable	Crude OR	95 % CI	Adjusted OR	95 % CI
No treatment	Pediatric residence	1.54	1.24-1.92	1.48	1.17-1.88
	Hospital setting	1.45	1.19-1.75	1.27	1.01-1.59
	Urban area	1.30	1.07-1.58	1.27	1.01-1.59
ICS	Non-residential pediatric speciality	1.28	1.02-1.59	1.31	1.03-1.66
	Primary health care setting	1.37	1.12-1.69	1.23	0.97-1.56
	Rural area	1.37	1.12-1.66	1.38	1.10-1.75

ICS: inhaledcorticosteroid.

and ≥ 5 to < 10 days in 13.1 %. Regarding the duration of the ICS for maintenance treatment, the responses were as following: 22.3 % of the pediatricians prescribed for < 15 days, 23.5 % for ≥ 15 days to ≤ 1 month, and 24.2 % for > 1 to < 3 months; however 20.4 % pediatricians did not answer this question.

Logistic regression analysis for the maintenance therapy shows that pediatricians with a pediatric residence, those who work in hospital and those who work in urban areas were likely to not using any other drug than SABA for the follow-up (table IV). However, pediatricians having a "non-residential pediatric speciality", and working in a rural area, and marginally those who work at a primary health center were those who chose ICS as maintenance therapy. In this analysis, OCS was not included as only a few pediatricians opted for them.

DISCUSSION

The simulated case study to pediatricians throughout Spain approximates the definition of a mild to moderate acute episode of wheezing (not necessarily the first one) of the Third International Pediatric Consensus Statement on the Management of Childhood Asthma published in 1998⁴. That consensus statement recommends the use of an inhaled SABA alone for the mild acute episode and more frequent doses of SABA or the addition of IB for the moderate acute episode. If there is rapid improvement, then treatment should be continued every 4-6 hours for a period of 24-36 hours, but if after 4 hours of the first SABA dose there is not a complete recovery, a course of 1-2 mg/kg/d of oral prednisolone or equivalent may be necessary. A large randomized clinical trial¹⁵ of acute wheezing episode in infants demonstrated significantly higher success after the first

hour of albuterol administrated via MDI with spacer and a face mask when compared with albuterol administrated via nebulizer (90 % vs. 71 %, respectively, $p = 0.01$) and only few patients required oral steroids; moreover, when a sub-analysis was performed in infants under 6 months or in those infants with first episode of wheezing attack the success rate was very similar. Considering these reports, a high proportion of our pediatricians (90.4 %) in the present study used SABA for the first acute wheezing attack; therefore it appears to be an appropriate practice. More than half of the pediatricians in the present study reported its use every 4 to 6 hours. However only 34.5 % of them used SABA as a sole drug, and 7.9 % added IB. The questionnaire did not specify whether the infant responded well or not to the SABA after the first 4 hours, so it is understandable that a certain number of pediatricians (31.3 %) would decide to prescribe an oral corticosteroid as well. Taking the three options of therapy together, around 74 % of the total population in our study answered according to the Third International Pediatric Consensus Statement. There were also quite a number of pediatricians (27.6 %) who decided combine an ICS with SABA as a first option. Although ICS are mainly for long-term treatment of children with recurrent wheezing, there have been some recent trials comparing the efficacy of OCS and very high doses of ICS in the treatment of the acute mild asthma episode after the ED discharge. A meta-analysis of those trials concluded that the efficacy is comparable, although a type II error could explain the results²¹. We, therefore not recommend to use ICS in the first acute wheezing attack.

Only 44.2 % of our pediatricians chose not to treat after the first wheezing episode. 20.7 % chose ICS alone and 6.1 % chose ICS plus SABA. As this was the first wheezing attack in a child with atopic eczema and a family history of allergy, the soundest

approach would be to “wait and see” and not to prescribe any maintenance therapy like ICS. Even if this first acute episode of wheezing is the first acute attack for asthmatic, the Third International Pediatric Consensus does not recommend specific prophylactic therapy⁴. In the case of children with intermittent asthma (without specific reference to infants) the new GINA also does not recommend prophylactic therapy, and only in those children with intermittent asthma and severe exacerbations must be considered moderate persistent asthma and should be treated with ICS at a dose of 400-800 mcg/day budesonide or equivalent². This approach is similar to the one proposed by the Guidelines for the Diagnosis and Management of Asthma in its 2002 update³ and those recently published by the British Thoracic Society¹⁹. These guidelines also state that there are few studies on asthma therapy in infants, and they do not recommend the use of ICS as maintenance therapy in this case. For many pediatric pulmonologists our simulated case does not fulfill the requirement for asthma based on the “asthma predictive index”⁵.

There are some demographic and personal characteristics that influenced the choice of the treatment suggested by the surveyed physicians for an acute attack of wheezing and for maintenance therapy. For the acute attack, pediatricians trained in a “pediatric residence” and pediatricians working in a hospital setting and in an urban area favored the use of SABA alone.

The humid climate of the coastal provinces as opposed to the dry continental of inland climate was associated with more frequent use of OCS and a less frequent use of ICS for the acute attack. In previous epidemiological studies in Spain²⁰ it was demonstrated that asthma in children is more prevalent and more severe near the coasts. Therefore, we can speculate that pediatricians from the coastal areas are more familiar with the management of the severe acute wheezing attack. They were also more reluctant to send the child to an ED.

Working in hospitals, being male and being a medium age pediatrician (more than 35 or less than 55 years of age) makes the use of IB more likely in the acute attack. We did not find any clear explanation for this; the fact that having a special interest in asthma was not associated with the addition of IB to SABA in the acute wheezing attack. We can only speculate that those pediatricians who work in hospital are those who deal with more severe asthma exacerbation episodes and they are familiar with the use of IB. Also, a possible explanation for why pediatricians in the middle age group use more IB could be because ten years ago the use of IB was very

popular among pediatricians in Spain. The youngest pediatricians are now taught to keep IB for more severe wheezing episodes.

There are certain limitations of this study. The first is that the request information comes from pediatricians, and it is not easy to know whether what they answered according to their practice of medicine or what they think should²². This study is not comparable to other asthma treatment audits that rely on drug prescription²³, or on information from parents about the drugs their asthmatic children are taking²⁴ or on recent retrospective information supplied by physicians on their recent therapy for asthma²⁵. Rather, it should be compared with studies that obtained information directly from physicians using case simulations. There is very limited information on this aspect of pediatrics and –to the best of our knowledge– none with an infant’s case presentation. The study by Finkelstein et al²⁶ enrolled 429 physicians, with a participation rate of 64 %; they used a scoring method on asthma cases’ scenarios, the mean total score of acceptable answers was 74 %, although the pharmacotherapy answers scored better (85 %). The three different cases presented in that paper are in children older than 3 years, an age where information from clinical trials and guidelines are much clearer. The study on self-reported attitudes by Vichyamond et al²⁷ provided no case presentations or information about the age of the child included but rather a questionnaire on acute and chronic asthma. 81.8 % of the surveyed pediatricians by Vichyamond and colleagues used salbutamol in the acute attack; this figure is somewhat lower but not dissimilar to than that of the present study (90.4 %). However, the big difference between these two studies consists in the use of antibiotics (i.e. 97 % in their study vs. 1 % in ours). Maintenance therapy with theophylline (43.8 % vs. 1.2 %, respectively), and ketotifen (90.4 % vs. 4.7 %, respectively) was also very different. The use of theophylline and ketotifen are not longer recommend by any of the international asthma guidelines^{2-4,19}. In recent years, the oral antileukotrienes have been used in asthma therapy, but they are not discussed in this consensus, and for the moment they have no role in the treatment of an acute episode in children²⁸.

A second limitation of this study –as usually occurs in a simulated case– is that there is little room to be more precise, i.e. the choice of a certain therapeutic regime could be very dependent on the progression of the attack over the next few hours and days. Or for many physicians the doubt could be if this acute wheezing episode corresponded to the first wheezing episode of an asthmatic child or if it represents acute bronchiolitis. However, no information was bringing in

the questionnaire to suggest a bronchiolitis case (e.g. antecedent of acute viral infection, winter season or possibility of uses some specific therapy like racemic adrenaline). Therefore, the first option of this simulated case could fit more into a first wheezing episode of an asthmatic child. Moreover, as mentioned before, several randomised trials have demonstrated the usefulness of SABA after the first hour of therapy in children with an acute wheezing attack, either for the first or for recurrent episodes using clinical score¹⁵ or oxygen saturation as outcomes^{16,17}.

To summarise, we described the Spanish pediatricians therapeutic approach to a simulated case of a first acute mild to moderate wheezing episode in an atopic infant and it seems to met published guidelines among pediatricians who had a formal training in pediatrics and in those who work in a hospital setting or in urban areas. However, some improvements could be made for those who had did not go through an accredited pediatric training program, who work in a primary care health center, or in a rural area in order to avoid the unnecessary use of ICS for the acute attack and maintenance therapy.

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Appendix

CLINICAL CASE

It is a 5 month-old male infant with a positive allergy family history and with two previous episodes of dermatitis with features of a typical atopic eczema. Twenty four hours before the consultation the boy started to cough and wheeze. He had no fever. Clinical signs included light tachypnea and sub-costal retraction; wheezing being confirmed on auscultation. There was no cyanosis. Otherwise, the child seemed in a good general state. This is the first time the child suffers from this disease. He is on no medication at the moment

1. Would you submit him to the emergency department at the hospital?
Yes ☐ No ☐
2. Would you use a short beta 2 agonist to improve his ventilation at the office?
☐ Yes, with a metered dose inhaler with a spacer and a face mask or a nebulizer
☐ Yes, without a metered dose inhaler with a spacer and a face mask or a nebulizer (I don't like them)
☐ Yes, without a metered dose inhaler with a spacer and a face mask or a nebulizer (I am not familiar with them)
☐ No, I would use another drug or route
3. In the case of using a short beta 2 agonist, what interval would you recommend?
30' ☐ 2 h ☐ 4 h ☐ 6 h ☐ 8 h ☐ 12 h ☐ On demand ☐
4. Would you also use simultaneously any of the drugs mentioned below to solve the attack? (you may mark several or none of them)

<input type="checkbox"/> Antibiotic	<input type="checkbox"/> Cromoglycate/Nedocromil
<input type="checkbox"/> Oral beta 2 agonist	<input type="checkbox"/> Ipratropium bromide
<input type="checkbox"/> Oral theophylline	<input type="checkbox"/> Ketotifen
<input type="checkbox"/> Rectal theophylline	<input type="checkbox"/> Other antihistamines
<input type="checkbox"/> Inhaled corticosteroid	<input type="checkbox"/> Antileukotriene
<input type="checkbox"/> Oral corticosteroid	<input type="checkbox"/> Inhaled corticosteroid + long acting beta2 agonist
<input type="checkbox"/> Parenteral corticosteroid	
5. Would you also use simultaneously any of the drugs mentioned below as a maintenance therapy after the attack? (you may mark several or none of them)

<input type="checkbox"/> Antibiotic	<input type="checkbox"/> Parenteral corticosteroid
<input type="checkbox"/> Inhaled beta 2 agonist	<input type="checkbox"/> Cromoglycate/Nedocromil
<input type="checkbox"/> Oral beta 2 agonist	<input type="checkbox"/> Ipratropium bromide
<input type="checkbox"/> Oral theophylline	<input type="checkbox"/> Ketotifen
<input type="checkbox"/> Rectal theophylline	<input type="checkbox"/> Other antihistamines
<input type="checkbox"/> Inhaled corticosteroid	<input type="checkbox"/> Antileukotriene
<input type="checkbox"/> Oral corticosteroid	<input type="checkbox"/> Inhaled corticosteroid + long acting beta2 agonist
6. Should you use an oral corticosteroid, which prednisone dose would you recommend? (in mg/Kg/d)
Don't know in mg ☐ 0,25 ☐ 0,5 ☐ 1 ☐ 2 ☐ 3 ☐ Other ☐
7. Should you use an oral corticosteroid, for how long (in days) would you recommend it in a first instance?
1 ☐ > 1- < 3 ☐ ≥ 3- < 5 ☐ ≥ 5- < 10 ☐ > 1- ≤ 10 ☐ > 10 ☐
8. Should you use an inhaled corticosteroid, for how long would you recommend it?
< 15 d ☐ ≥ 15 d- < 1m ☐ ≥ 1m- < 3 m ☐ ≥ 3m- < 6 m ☐ ≥ 6 m ☐
9. When would you see the child again?
☐ Same morning
☐ Following day
☐ In one week
☐ I would not program any visit
10. Would you submit this child to a:
☐ Pediatric pulmonologist
☐ Pediatric allergologist
☐ Any of the above
☐ I would not submit it