

A Survey on the Management of Children with Asthma in Primary Care Setting in Italy

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Asthma is common in childhood and entails several phenotypes and endotypes that require adequate investigation.^{1–3} Asthma control is the goal of asthma management as recommended by the “Global Initiative for Asthma.”⁴ Unfortunately, about half of the affected children do not achieve control.⁵ Moreover, some of these children with poorly controlled asthma also have severe asthma.⁶ Many factors cause uncontrolled and severe asthma, including poor adherence, comorbidity, allergy, infections, pollution, emotional distress (also in the parents), health literacy, low socioeconomic situation, and inadequate and/or suboptimal asthma management.^{7–9} In this regard, primary care physicians have a crucial role to play in the management of children with asthma.

The Italian health service includes pediatricians in primary care. The primary care pediatrician usually takes charge of about 800 children (0–14 years of age). The task is to provide essential assistance, including prevention, information, and possible referral to the specialist when necessary. To become primary care pediatrician (the correct denomination is pediatrician of open choice), it requires the achievement of the postgraduate degree (5-year course) and pole position in a regional merit ranking.

The Italian Society of Pediatric Allergy and Immunology (SIAIP) has instituted a project on asthma control in children (Control'Asma Project) to investigate the factors involved and required

treatments.¹⁰ In this regard, the steering committee promoted a survey to investigate asthma management in a clinical practice setting. A selected group of 93 Italian primary care pediatricians participated in this initiative. The panel was randomly selected from the national registry of the health service, extracting 100 names. This criterion served to assure that the outcomes can be representative of the global Italian situation. The anonymous survey consisted of a questionnaire sent by e-mail. The questions concerned a series of practical issues addressed in daily practice (Supplementary Table S1).

These pediatricians follow 77,121 children, including 15,886 (20.6% – 20.3%) with postinfectious wheezing and 7,264 (9.5% – 7.4%) with diagnosed asthma (Table 1). In the asthmatic group, 72.9 (–18.4)% had intermittent asthma, 25.4 (–18)% persistent asthma, and 1.7 (–2.9)% severe asthma. The asthma severity grade was measured according with the Global INitiative for Asthma (GINA) guidelines. Supplementary Table S1 shows that 70% of pediatricians prefer to manage children together a specialist (pediatric allergist), but 60% directly prescribe the asthma treatment, only one-third accept the specialist's prescription. Allergy assessment by prick test was correctly performed at any age by 60% of participants, lung function tests were performed in two-thirds of the participants starting at 5–6 years of age. Persistent exercise-induced dry cough was directly managed, using inhaled corticosteroids (ICS) by half of the participants, but the other half preferred to refer children to the specialist. Interestingly, nobody prescribed cough suppressants neither consulted an ear, nose, and throat specialist. Concerning intermittent asthma, 45% of participants used low-dose ICS, 28% prescribed bronchodilators on demand, 16% prescribed antileukotriene (anti-LT) drugs, and 11% referred to the specialist. For children with frequent use of short-acting b₂-agonist, 70% of participants used ICS or anti-LT drugs, 27% consulted a specialist, only 3% preferred to wait and see. Eighty percent of the participants always assessed the asthma control, 14% sometimes, and 6.5% only after an asthma exacerbation. The asthma control was assessed according with the GINA guidelines. Spacers were recommended by 61% of participants in children <6 years of age by 20%, and <12 years by 17%. Asthma comorbidity was investigated by 41% of participants, often by 47%, and rarely by 9%. Almost all (97%) pediatricians evaluate the adherence to therapy, but only 84% always assessed the symptomatic use of salbutamol. Allergen-specific immunotherapy is regarded as useful to reduce exacerbations and medications by 71%, but only 20% referred to the specialist for the decision. Instead, more than half (54%) consulted the specialist for the possible use of biologics in children with severe asthma.

The current survey results updated the prevalence of postinfectious wheezing (20.6%) and asthma (9.5%) in Italy, observed in clinical practice. These outcomes were substantially consistent with the most recent Italian studies on wheezing and asthma prevalence. Peroni observed a 12.1% prevalence of wheezing and 8.6% of asthma in 1,402 preschool children.¹¹ The SIDRA 2 study showed an asthma prevalence of 6.8% in 33,632 children and adolescents living in congested cities.¹² More recently, Indinnimeo reported a prevalence of 15% for wheezing and 11% for asthma in 494 preschoolers.¹³

In contrast, the present survey highlighted some relevant outcomes that could identify factors involved in the poor/inadequate asthma control. Potential factors involved in inadequate asthma control may include the insufficient referral to allergy/asthma centers. This attitude was consistent with the preference of directly prescribing the asthma treatment. Namely, half of the primary care pediatricians prescribe ICS in children with exercise-induced dry cough and symptomatic

bronchodilator in intermittent asthma, referring to the specialist only 10% of children. In children with uncontrolled asthma, as evidenced by frequent use of a bronchodilator, most pediatricians directly prescribed ICS or anti-LT drugs. Surprisingly, whereas the asthma control and salbutamol use were always assessed by 80% and 84%, respectively, of participants, the asthma comorbidity was only investigated by 41%. Nevertheless, adherence to therapy was almost always (97%) evaluated, by direct question and assessing the medical prescriptions. Consultation for allergen immunotherapy was pursued from specialists in 20% of the children, whereas referrals for the possible use of biologics were obtained in 55% of the children with severe asthma.

These outcomes are clinically relevant because they are derived from a large and representative panel of primary care pediatricians; thus, they mirror daily practice. The strength of this survey relies on the sample size, including about 80,000 children living across Italy. Wheezing and asthma are common diseases, and their prevalence seems to be also growing in Italy.

In contrast, this survey had some limitations, including the cross-sectional design, limited number of participants (but the nature was explorative to temporarily define the “mean” attitude in asthma management), and anonymity that did not allow to stratify outcomes per regions. Moreover, the Italian health service has specific characteristics that are different from other countries. For example, in Italy preschooler children should be followed only by a pediatrician and position of the nurse is not required in the pediatrician office. Namely, further studies should be conducted to answer these unmet needs, mainly concerning the identification of the most relevant facets of asthma management and investigation the differences of how they are managed if the patients are (or not) referred to secondary or third-level centers.

Surprisingly, at our best knowledge, there is no recent Italian study investigating this issue. In the 1990s, a multinational study investigated the prescribing pattern by general practitioners in 6 European countries, including Italy.¹⁴

In Italy, asthma consultations and medications were less than in other countries. A further multinational study compared asthma control test (ACT) score and GINA-based asthma control among patients attending also primary care offices.¹⁵ However, no inter-countries comparison was performed.

About 20 years ago, a survey interviewed Spanish primary care pediatricians concerning the asthma management.¹⁶ The outcomes showed that there was need to improve care level, mainly regarding the record-keeping, diagnosis work-up, follow-up, and education.

A further Spanish study, conducted to implement the national asthma guidelines, evidenced the association between the use of high doses of short-acting bronchodilators and asthma deterioration in children managed in primary care setting.¹⁷

More recently, a survey showed there is still an inadequate management of asthma by Spanish primary care doctors, concerning the lack of validated protocols, questionnaires, educational materials for assessing adherence and inhalation technique, and limited coordination between health care levels.¹⁸

Cropper et al. outlined the importance of adequately giving health resources to “likely asthmatic” children at UK primary care.¹⁹

A further UK study reviewed the management of childhood asthma in primary care and concluded that consultations needed to be more proactive and adopt a family-centered approach, including a role for practice nurse.²⁰

Thomas explored the prescribing patterns of asthma controller therapy for children in UK primary care.²¹ The outcomes showed that the asthma severity, scored by primary care doctors, was inconsistent with guidelines recommendations and there was overprescription of medications. A recent study evidenced that abnormal lung function and high FeNO levels are common and related to symptom severity in children seen in UK primary care settings.²² Therefore, the symptom-based approach to monitor asthmatic children is inadequate to identify patients at risk of future severe asthma episodes.

An Estonian study outlined the clinical relevance of shifting chronic diseases management, including asthma, from hospitals to primary care as there were less hospitalizations and improved outcomes.²³

The pediatric asthma care patient outcomes research team trial, conducted in US primary care practices, demonstrated that asthma care improvement interventions increased the use of controller medication.²⁴

An US study documented that children seen by specialists compared with those seen by primary care doctors had different clinical patterns, including more severe and poorly controlled asthma, and more comorbidities.²⁵

Another US study reported different levels of implementation of recommended asthma care between primary care groups.²⁶ Primary care pediatricians had high adherence in improving assessment, monitoring, and patient education. These findings were consistent with a 5-year project of implementation of the asthma control test in US primary care to improve children's outcomes.²⁷ The incorporation of ACT in asthma management allowed to easily identify uncontrolled children and improve health care quality. Consistently, a performance improvement project led to significant change in all indicators of quality asthma care provision to children with asthma seen in US rural primary care practices.²⁸

The National Ambulatory Medical Care Survey collected data from 2012 to 2015.²⁹ The main outcome showed that the lack of documentation of asthma control and uncontrolled asthma were associated with oral and ICS use in children with asthma. Therefore, a more effective implementation of asthma guidelines could improve the quality of asthma care in pediatric population. This conclusion was reinforced by a further study that underlined the need to increase the documentation of asthma severity and control by primary care pediatricians.³⁰

A New Zealand study demonstrated that some mothers disagreed with some aspects of general practitioner care for the child asthma, it entailed inadequate asthma management.³¹

A South African study reviewed clinical records of asthmatic patients seen in primary care settings.³² The initial screening documented suboptimal clinical asthma control, so after adequately addressing the clinical requirements, improvement of asthma control was observed in the follow-up period. Therefore, this study underlined the importance of dedicated and continuous motivation to improve quality of care.

A Vietnamese study investigated the adoption of GINA guidelines by primary care doctors.³³ The study reported that few primary care doctors adhere to guidelines in asthma management; consequently, they prescribe medications with a high risk of side effects and the asthma control is inadequate in their patients.

These studies highlighted that the asthma management by primary care pediatricians should be improved as the rate of controlled asthma in children is still unsatisfactory. However, adequate programs of education could improve the quality of care. A closer partnership between primary care and the hospital is, therefore, desirable.^{34,35} In this regard, a local project of close partnership hospital-primary care is ongoing. The purpose is the acquisition of skill adequate management of children and adolescents directly in primary care office, referring patients to second-/third-level centers only if asthma is continuously uncontrolled or severe.

In conclusion, the present survey confirmed the high prevalence of asthma and wheezing in Italian children. However, asthma management at primary care needs to be implemented and improved to ensure adequate asthma control.

Authors' Contributions

M.A.T. designed the study; I.S. analyzed the data; M.D. and G.L.M. discussed the outcomes; G.C. drafted the article; all authors approved the article.

Author Disclosure Statement

The authors have no conflicts of interest relevant to this article to disclose.

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Supplementary Material

Supplementary Table S1

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Table 1. Prevalence of Postinfectious Wheezing and Confirmed Asthma in Children in the Care of 93 Pediatricians

Children with postinfectious wheezing	20.6 ± 20.30
Children with a confirmed diagnosis of asthma	9.5 ± 7.44
Children with intermittent asthma	72.9 ± 18.37
Children with persistent asthma	25.4 ± 18.02
Children with severe asthma	1.7 ± 2.91

Data referred to 77,121 children, and 15,886 of them with postinfectious wheezing and 7,264 with confirmed asthma. Results are expressed as mean (–standard deviation) percentages.