

AUDIT OF PATIENT'S RECORDS REGARDING THE DIAGNOSIS AND TREATMENT OF ASTHMA IN CHILDREN

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Abstract

Asthma is a common chronic pathology in children, with a growing prevalence and morbidity. The diagnosis of asthma is mainly a clinical one, but is difficult to sustain, especially for children under five years old. *Objective:* analysis of quality of medical records regarding the criteria that were used for supporting diagnosis and choosing the treatment of asthma in children, to identify nonconformities and take action to remedy them. *Methods:* The audit asked questions about the correctness of filling medical documents regarding patients demographics, asthma risk factors, diagnostic criteria, investigations performed, treatment and asthma education for children aged 3 to 15, diagnosed with asthma, who presented for an evaluation in the Pediatric Pneumology Service, in the second semester in 2015. *Results:* We observed deficiencies regarding risk factors/triggers of asthmatic crisis identification, especially related to food allergy, pet exposure, exercise and smoke exposure. More accurate reporting is needed about the criteria for determining the severity and the level of disease control using GINA guidelines classifications for asthma in children as well as Asthma Control Questionnaires. Furthermore, we insist on training and evaluation of inhaled medication administration technique, medical education on asthma prophylaxis and the issue of a written personalized asthma action plan at the end of the visit to the specialist. *Conclusions:* Audit is an important instrument for any clinician used to measure the outcomes, improve the quality of medical practice and decrease the burden of the disease.

Key words: Celiac disease, HLA DQ2/DQ8 typing, children

Introduction

Asthma is more and more becoming a common chronic pathology in children, with a growing prevalence and morbidity related to increasing prevalence of atopy and allergic diseases [1]. In Romania, the prevalence of asthma is approximately 5-7% [2], but varies according to the area or various countries between 1 and 18% [3]. The disease is diagnosed in more than half of cases in childhood, up to 10

years old, initially being more common in boys [2,4]. Diagnosis is difficult especially for children under 5, has a variable evolution and symptoms disappear with age in a considerable percentage, with the possibility of recurrence after 40 years [1]. Even though in most cases of children with asthma (80%), symptoms occur under the age of 5, these are not recognized or, frequently, child's evolution is monitored for a longer period, before supporting the certain diagnosis of asthma [5]. In children, the diagnosis is supported by a detailed history of specific symptoms like wheezing, cough, breathlessness, and chest tightness with an episodic pattern, in relation to presence of risk factors (airborne indoor and outdoor allergens, secondhand cigarette smoke, viral upper respiratory infection, chronic sinusitis and pneumonia with *Mycoplasma pneumoniae* or *Chlamydia* species, exercise, weather changes) [3,6]. Given the fact that asthma has a genetic predisposition, is very important to identify the presence of special conditions, such as personal and family history of atopic disease (atopic dermatitis, food allergy, allergic rhinitis, asthma) [7-12]. The physical examination could be very suggestive in acute exacerbation or asthma attack (wheezing, prolonged expiration, and sibilants with or without signs of rhinitis, conjunctivitis, sinusitis, eczema), but could be normal between asthma attack [2-4,13]. Documentation of reversible obstruction on spirometry is possible after 5-6 years of age or older [14]. A positive bronchodilator response in children younger than 12 years old is considered an increased FEV₁ with 8% [14-15]. Demonstration of peak expiratory flow limitation variability and an elevated value of total serum immunoglobulin E (IgE) may be suggestive for asthma diagnosis after the age of 3 [3]. Exclusion of another diagnosis is also essential, especially for other wheezing illnesses [16]. Asthma is known as a chronic inflammatory disorder with an excellent response at inhaled corticosteroids [1,4,6]. The treatment is chosen by severity and frequency of asthma symptoms, and includes avoiding asthma triggers, rescue and controller medications (inhaled glucocorticoids, leukotriene modifier, and long-acting bronchodilator), medical education and personalized asthma action plan [6].

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Objective

Is to analyze the quality of medical records regarding the criteria for supporting diagnosis and choosing the treatment of asthma in children, to identify nonconformities and take action to remedy them. Thus, we monitor if age, BMI, symptoms and crisis characteristics, risk factors, the condition of atopy, results of clinical examination of functional respiratory exploration and level of eosinophils and IgE, the severity, and level of asthma control, prescribed treatment, are registered. The recommendations resulting from medical audit will be submitted and put into to improve the quality of medical act and compliance with guidelines in force.

Methods

We retrospectively evaluated medical records belonging to children aged 5 to 15, diagnosed with asthma, who presented for an evaluation in the Pediatric Pneumology Service, in the second semester in 2015. The audit asked questions about the correctness of filling medical documents regarding age, body mass index, risk factors, diagnostic criteria, investigations performed, treatment and advice received by patients or their parents. At the same time, we observed demographic, clinical and treatment characteristics of children diagnosed with asthma.

Results

The table below shows the audit results, and the missing data from medical records were identified (table 1). The data were collected from 40 children, with an average age of 11.82 years, diagnosed with asthma, which addressed the pediatric pulmonology service for a consult. 62.5% of children were male, and only 5% were under five years old, the rest being in relatively equal proportions between 5 and 12 years old and over 12 years old (27.5% vs. 30%). Girls, although significantly fewer in number than boys (15 (37.5) vs. 25 (62.5)) had the same distribution by age group (5% under 5 years old). Our data showed that the weight of male children was slightly higher than of girls' (19.52 vs. 18.18), suggesting that obesity may be a risk factor for asthma [1]. All medical documents contained demographics of children (100%). Regarding identification of trigger factors for asthma attacks, as well as predisposition to develop asthma, we found that there was nothing stated about the presence of pets in home in 67.5% of cases, the data about possible food allergies were missing in 57.5% of cases, and second-hand cigarette smoke exposure in home environment in 25% of cases.

All cases had completed symptoms history and clinical exam. The most frequent symptoms described by children were: 40% dyspnea, 28% dry or a productive cough, 27.5% wheezing, and 37.5% had a clinical examination suggestive of asthma. Spirometry with bronchodilator test was used in 82.5% of cases, but it was not applied to children under five years old. There are studies showing that the bronchodilator test with short-term betamimetics can be performed when the ventilatory function is normal, in some cases bronchodilation being highlighted [1,16]. Unfortunately, in

40 % of cases it was not mentioned whether the spirometry technique was correct or not, if forced vital capacity-FVC and forced expiratory volume in 1 seconds-FEV1 data met ATS/ERS acceptability and repeatability criteria. In 30% of cases, detailed explanations were needed about the severity of asthma and control level. Asthma Control Questioner was not currently used. All patients had indications for therapy: 50% received a combination of inhaled corticosteroid with long active bronchodilator, 30% inhale corticosteroids, 52% anti-leukotriene and 45% salbutamol as reliever medication. In 25% of cases, it was neither specified if the correct inhalation technique had been used, nor if patients had been instructed on the administration of medication inhaler. In 65 % of cases written personalized asthma action plan was missing.

Discussion

Medical audit is a systematic analysis of the quality of medical care that evaluates the tools used in diagnosis, the treatment prescribed, and management of disorders [17-20]. Auditing is an essential instrument for any clinician used to measure the outcomes, to improve the quality of medical practice and decrease the burden of the disease. As we know, this study is among the first medical audits in pediatric asthma in our county. A correct diagnosis and treatment of asthma reflects in a normal lifestyle, with no exacerbations or hospitalizations, lack of symptoms and a normal respiratory function under minimal inhale treatment [4,16]. In children, especially under the age of five, the diagnosis is supported by clinical symptoms related to the conditions of developing the disease (trigger factors), repeatability, personal and family atopic status, as it is one of great medical responsibility. For this reason, a detailed record of historical data is extremely important. Only 4 children under five were evaluated, one possible explanation could be the type of phtisio-pediatric ward, which lacks an intensive care unit. As specified in other studies, asthma prevalence was higher in boys (62% vs. 37%) [18,21]. In the medical records of patients evaluated, while revising the diagnostic criteria, symptoms recording can be observed in 100% cases, suggestive clinical examination in 37.5% of cases, and the presence of atopy in 50% of cases. Heart rate and oxygen saturation should be also recorded, as well as the degree of dyspnea, and use of accessory muscles. We found a reduced ability to identify and record the history of allergies, especially the food ones, pet presence in homes or exposure to parental smoking. In general, risk factors history is reduced to questions about what the children or their parents think that could trigger asthma attacks, such as dust, pollen, molds and viral infections. Food allergies, as well as exposure to hair and pet droppings (cats, dogs, fish aquarium, budgerigars) are important in children. Children exposure to parental smoking may also represent both a trigger factor of asthma crises followed by admission to hospital, and a cause of the lack of disease control under treatment [20]. It is necessary on consultation date be clearly set out if children are passive smokers, and parents be motivated to quit smoking.

Table 1. Characteristics of asthma.

N= (%)	Asthma cases n=40; (100)	Male n=25 (62.5)	Female n =15 (37.5)	Missing data n=0 (0)
Mean Age:	11.82	11.4	12.53	0 (0)
BMI kg/m ²	19.5	19.52	18.16	17 (42.5)
< 5,	4 (10)	2 (5)	2 (5)	0
5-12,	18 (45)	11 (27.5)	7 (17.5)	0
>12.	18 (45)	12 (30)	6 (15)	0
Risk factors and special condition				
Present personal atopy	20 (50)	11 (27.5)	3 (7.5)	15 (37.5)
Present family atopy	8	5 (12.5)	3 (7.5)	29 (72)
History of asthma (month)	36.15	52.36	13.87	20
Smoker	2 (5)	2 (5)	0	0
Secondhand cigarette smoke exposure	4 (4)	2 (5)	2 (5)	10 (25)
Pet exposure	5 (12.5)	3	2 (5)	27 (67.5)
Food allergy	6 (15)	3	3 (7.5)	23 (57.5)
Symptoms				
Dyspnea	16 (40)	11 (27.5)	5 (12.5)	0
Dry Cough	12 (30)	7 (17.5)	6 (15)	0
Productive Cough	16 (40)	9 (22.5)	7 (17.5)	0
Wheezing	11 (27.5)	9 (22.5)	2 (5)	0
Chest tightness	3 (7.5)	2 (5)	1 (2.5)	0
Suggestive Clinical exam	15 (37.5)	7 (17.5)	8 (20)	0
Repeatability	15 (37.5)	10 (25)	5 (12.5)	0
IACRS related	6 (15)	5 (12.5)	1 (2.5)	10 (25)
Functional respiratory test				
Spirometry	33 (82.5)	20 (50)	13 (32)	3 (7.5)
Bronchodilator test	9 (22.5)	7 (17.5)	2 (5)	0
Correct technique - yes	19 (47.5)	13 (32)	6 (15)	16 (40%)
Analyses (present data)				
Eosinophils	16 (40)	8 (20)	8 (20)	24 (60)
IgE	4 (10)	2 (5)	2 (5)	36 (90)
Severity/ control of asthma	28	15	13 (32,5)	12 (30)
Treatment				
SABA	18 (45)	11 (40)	7 (17.5)	0
ICST (inhale corticosteroid)	12 (30)	6 (15)	6 (15)	0
Correct inhaler technique	10 (25)	4 (10)	6	10 (25)
Combination LABA/ICST	20(50)	12 (30)		
Salmeterol-fluticasone	7 (17.5)	3 (7)	4 (10)	0
Formoterol- budesonide	13 (32.5)	9 (22.5)	4 (10)	0
Anti-leukotriene	21 (52)	12 (30)	4 (10)	0
Antiallergic	10 (25)	5 (12.5)	9 (22.5)	0
Written personalized asthma action plan	14 (35)	9 (22.5)	5 (12.5)	26 (65)

Physical exercise and sleep disordered breathing are scarcely mentioned in medical letters, even if they play a significant role in child's asthma. It is also known that asthma is an inherited disease, the risk that a child becomes asthmatic is 2.6 times greater if a parent is asthmatic [22, 23]. Between 37 and 72% of cases we had no information about family history of atopy and personal atopy, these being important criteria for suspicion of asthma in children. Spirometry was used in children over 8 years old for documenting obstruction, and a FEV1 reversibility over or

equal to 8% was considered significant, different from the value of 12% (200 ml) in adults. It is very important to note all ERS/ATS validity and repeatability criteria of flow / volume curve. In patients already diagnosed with asthma, clinical evaluation should include data about the frequency of daytime and nocturnal symptoms, identification of exacerbations, daily asthma medication (control and reliever), and level of obstructive dysfunction, in order to classify the severity of the disease. Monitoring diurnal variability of PEF represents another indicator of severity in

asthma, and no PEF-meter evaluation was specified. Patients with less 75% predicted PEF and variability over 25% have a higher risk of exacerbation [18]. We propose to check the inhale technique for every drug device during every medical visit. The disappearance of symptoms under treatment is a criterion for a positive diagnosis of asthma, but an incorrect technique can lead to a lack of disease control and patients' poor adherence to treatment. The assessment of each patient must be followed by recommendations for asthma prophylaxis, with identification and avoidance of

precipitation triggers, explanations regarding self-monitoring and written asthma personalized control plan.

Conclusions

Medical audit studies identify deficiencies in medical activity and their correction leads to an improved quality of medical practice. Adoption of protocols in the ward, in accordance with international guidelines, results in a better management of the disease, an increased quality of patients' life and a decrease in medical costs.

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