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ORIGINAL ARTICLE
ORİJİNAL ARAŞTIRMA

Evaluation of Children with Asthma Followed Up at Tertiary Center in Terms of Exposure to Secondhand Smoke Through Their Parents

Kliniğimizde takipli astım tanılı çocukların ebeveynleri aracılığıyla sigara maruziyetleri açısından değerlendirilmesi

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ABSTRACT

Introduction: This study aimed to evaluate exposure to secondhand smoking in the prenatal and postnatal period through parents in pediatric patients under the age of five years diagnosed with asthma who were followed up at our clinic.

Material and Method: To determine the demographic characteristics of the patients and passive smoking exposure, the study form, which included smoking exposure histories through their parents during the prenatal, breastfeeding period and first year of life, frequency of attacks, number of attacks requiring hospitalization, and the treatments they were receiving, was filled by the mother or father.

Results: Of the 52 patients, six (11.5%) were exposed to smoking during the intrauterine and the breastfeeding period, and 12 (23%) were currently exposed to smoking through their mothers. For smoking mothers, the age of onset of smoking was 13–20 (mean: 17.3±2.49) years. The mean daily amount of smoking by mothers was found to be 8.5±5.88 cigarettes/day. The number of smoking fathers was 31 (59.6%), and the mean daily amount of smoking by fathers was found to be 18.2±9.6 cigarettes/day.

Conclusion: Smoking exposure from asthma risk factors remains important. The harm due to smoking exposure during breastfeeding should be emphasized. We think that it would be beneficial to increase the awareness of clinicians, patients, and parents about passive smoking exposure, which is one of the most important obstacles against full control in asthma.

Keywords: Asthma, child, smoke exposure

ÖZ

Amaç: Çalışmamızda; kliniğimizde takip edilmekte olan beş yaş altı astım tanılı hastalarımızın prenatal ve postnatal dönemde ebeveynleri aracılığıyla sigara maruziyet durumunun değerlendirilmesi amaçlanmıştır.

Gereç ve YÖntem: Hastaların demografik özellikleri ile birlikte pasif sigara maruziyetlerini belirlemek üzere: doğum öncesi, emzirme dönemi ve ilk bir yaştaki ebeveynleri aracılığı ile sigara temas öyküleri, atak sıklıkları, hastaneye yatış gerektiren atak sayısı ve almakta oldukları tedavileri içeren çalışma formu anne yada baba tarafından doldurduldu.

Bulgular: Çalışmamıza dahil edilen 52 hastanın altısının (%11,5) intrauterin dönemde, altısının (%11,5) emzirme döneminde ve 12'sinin (%23) halihazırda annesi aracılığıyla sigara maruziyeti olduğu saptandı. Sigara içen annelerin sigaraya başlama yaşı 13-20 (ortalama: 17,3±2,49) idi. Annelerin günlük ortalama sigara içme miktarı 8,5±5,88 sigara/gün olarak bulundu. Sigara içen baba sayısı 31 (%59,6) ve babaların günlük ortalama sigara içme miktarı 18,2±9,6 sigara/gün olarak saptandı.

Sonuç: Astım risk faktörlerinden sigaraya maruz kalma önemini korumaktadır. Emzirme döneminde sigaraya maruz kalmanın zararları vurgulanmalıdır. Astımda tam kontrolün önündeki en önemli engellerden biri olan pasif sigara maruziyeti konusunda klinisyenlerin, hastaların ve ebeveynlerin bilinçlendirilmesinin faydalı olacağını düşünüyoruz.

Anahtar Kelimeler: Astım, çocuk, sigaraya maruz kalma

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INTRODUCTION

Asthma is the most common chronic disease of childhood. It is estimated that 300 million people of all ages are affected by asthma all over the world. Children under the age of five years diagnosed with asthma constitute a special group within the entire asthma population due to the difficulties in diagnosis and treatment (1,2).

Considering the risk factors related to the development of asthma in childhood, it is known that environmental factors play an important role in addition to factors such as genetic predisposition, airway hypersensitivity, sex, and race. Allergens, infections, exercise, air pollution, chemicals, and smoking are among the environmental factors that have been associated with asthma (3).

In addition to being an important risk factor for the development of asthma, exposure to smoking in the prenatal and postnatal periods also leads to treatment failure by increasing inflammation in the airways (4).

Therefore, this study aimed to evaluate exposure to secondhand smoking in the prenatal and postnatal period through parents in pediatric patients under the age of five years diagnosed with asthma who were followed up at our clinic.

MATERIAL AND METHOD

Case Selection

The study was conducted between 1 April 2017- 1 July 2017 at a tertiary care children's hospital. A total of 52 pediatric patients under the age of five years diagnosed with asthma who were followed up at Pediatric Allergy and Immunology Clinic, Dr. Sami Ulus Obstetrics and Gynecology, Children's Health and Disease Training and Research Hospital, University of Health Sciences, were included in the study. The patients were diagnosed with asthma in line with the recommendations of the Global Initiative for Asthma Report (1), considering four basic parameters clinically:

1) Symptom pattern suggestive of asthma

a) Cough (increasing at night, accompanied by mild wheezing and shortness of breath, recurrent, without sputum, without respiratory tract infection, or developing with exercise, laughing, crying, or exposure to smoking and allergens)

b) Wheezing (experienced at night and triggered by activity, laughing, crying, cigarette smoke, or air pollution)

c) Shortness of breath (during exercise, laughing, or crying)

d) Decrease in activities (not running, playing, or laughing with the same intensity as other children, getting tired quickly during walks, and wanting to be carried on the lap)

2) Presence of risk factors for the development of asthma (familial atopy and asthma, personal food allergy, and atopic dermatitis history)

3) Clinical improvement with control therapy and exacerbation of symptoms upon discontinuation of therapy

4) Exclusion of alternative diagnoses

Data Collection

To determine the demographic characteristics of the patients and passive smoking exposure, the study form, which included smoking exposure histories through their parents during the prenatal, breastfeeding period and first year of life, frequency of attacks, number of attacks requiring hospitalization, and the treatments they were receiving, was filled by the mother or father. All participants were given a written informed consent form before inclusion in the study. The study was approved by the Dr. Sami Ulus Maternity and Children Training and Research Hospital Clinical Research Ethics Committee. The study was conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS

The study included 52 patients with asthma under the age of five years, with a mean age of diagnosis of 37.5±17 months, followed up at our Pediatric Allergy and Immunology Clinic. When the patients were evaluated in terms of the treatments they were receiving, it was found that 39 (75%) received regular inhaled corticosteroid therapy, one (1.9%) used leukotriene receptor antagonists, and 11 (21%) had to receive more than one control therapy (inhaled corticosteroid and leukotriene receptor antagonists) to achieve full control. It was determined that all of the patients had inhaler short-acting beta-agonists for use as a rescue medicine when needed.

Of the 52 patients, six (11.5%) were exposed to smoking during the intrauterine and the breastfeeding period, and 12 (23%) were currently exposed to smoking through their mothers. For smoking mothers, the age of onset of smoking was 13–20 (mean: 17.3±2.49) years. The mean daily amount of smoking by mothers was found to be 8.5±5.88 cigarettes/day. The number of smoking fathers was 31 (59.6%), and the mean daily amount of smoking by fathers was found to be 18.2±9.6 cigarettes/day.

Nine (17.3%) patients were found to have been exposed to smoking through someone other than their mother and father (sibling, grandfather, or grandmother). The rate of patients with passive smoking in the first year was 61.5%.

The clinical characteristics of the patients, including age at the first attack, the total number of attacks, and hospitalization status, and data on smoking exposure through their parents are summarized in **Table 1.**

Table 1. Data on the clinical characteristics and smoking exposure of the patients (n=52)

Parameter	n (%)
Age of diagnosis (months)	37.5 (min-max:7-60)
Age at first attack (months)	21.5 (min-max: 2-60)
Total number of attacks	8 (min-max: 2-20)
Number of attacks requiring hospitalization	1.3 (min-max:0-10)
Data on smoking of mothers of patients	
Number of mothers who smoke, n, (%)	
Intrauterine period	6 (11.5%)
during breastfeeding period	6 (11.5%)
currently	12 (23%)
Daily amount of smoking by mothers; cigaretters/day, (mean±SD)	8.5 + 5.8
Age of onset of smoking (mean, years)	17.3 (min-max:13-20)
Presence of respiratory symptoms, n, (%)	8 (15.4%)
Presence of allergic disease, n (%)	8 (15.4%)
Data on smoking of fathers of patients	
Number of smoking fathers, n (%)	31 (59.6%)
Daily amount of smoking by fathers; cigaretters/day, (mean±SD)	18.2 + 9.6
Presence of respiratory symptoms, n (%)	7 (13,5%)
Presence of allergic disease, n (%)	6 (14.5%)

DISCUSSION

The present study aimed to evaluate smoking exposure, one of the most known environmental risk factors, in patients under the age of five years diagnosed with asthma, which is a special group that is difficult to diagnose and treat, during pregnancy, breastfeeding, and later periods.

Childhood smoking exposure: Recent global estimates report that 40%–70% of children worldwide have some form of exposure to tobacco smoke (5). In a study that included healthy children aged 1–10 years, 37% of the children were regularly exposed to indoor cigarette smoke through their parents (6). When we look at pediatric patients with asthma in the United States, passive smoking exposure was found in 53% of children with asthma despite multifaceted national prevention strategies (7). In another study that included 482 asthma patients aged 8–14 years, the rate of passive smoking was found to be 68.5% in the city center of Chicago (8). In the study of Kıral et al. conducted in Turkey, the indoor smoking exposure rate of 113 patients with asthma aged 3–14 years was 67% (9). Although the sample was composed of small age group children, similar high rates were determined in the present study.

Intrauterine smoking exposure: The mothers of six (11.5%) patients with asthma included in our study stated that they smoked during pregnancy. The prevalence of maternal smoking during pregnancy varies considerably between countries. In Turkey, this rate was found to be approximately 15% in previous studies, similar to the results obtained here (10). This rate is approximately 5% in countries such as Sweden, Austria, and Switzerland, and can go as high as 15%–20% in the Netherlands, Serbia, Croatia, and England, and 40% in Greece (11). In the present study, the mean age at which mothers started smoking was found to be 17.3 years, but it is noteworthy that some started smoking as early as 13 years of age. It is known that smoking during pregnancy is more common in younger and less educated women and those with low income (12). We think that the low age of onset of smoking in our study may be related to the fact that our hospital is located in a low-income area of Ankara.

The nicotine that the fetus is exposed to in the intrauterine period has been associated with decreased alveolarization, decreased lung functions, airway obstruction, increased allergic inflammatory response, adverse effects on small airway development, and increased risk of asthma and wheezing in the first 10 years of life (14). However, even if the mother herself does not actively smoke during pregnancy, exposure to smoking in the home has also been associated with physician-diagnosed asthma (4,14). For this reason, we think that it is important to question smoking exposure in the intrauterine period together with the current smoking exposure status in patients followed up with a preliminary diagnosis of asthma. In addition, we would like to emphasize the issue of raising awareness among all pregnant women about avoiding secondhand smoking exposure.

Smoking exposure during breastfeeding: The mothers of six (11.5%) patients stated that they smoked during breastfeeding. This period is important in terms of the passive exposure of the baby to cigarette smoke as well as nicotine that passes through breast milk. It has been shown that the amount of nicotine in the breast milk of women who smoke during lactation is much higher than that in the plasma levels (15). In another study evaluating urine cotinine levels, the urine cotinine level of babies with smoking mothers was found to be significantly higher than that of babies with nonsmoking mothers. The highest level was found in the group exposed through breast milk. It was emphasized that tobacco exposure through breast milk is the most harmful route (16). In particular, it would be beneficial to consider outpatient clinic control of healthy children in the infantile period as a window of opportunity to prevent or terminate this contact.

The present study is a survey study based on personal statements. Therefore, indoor exposure may have been under-reported by parents. In addition, there is a risk of exposure, albeit not regular, in social environments outside the home, and this situation was not evaluated in the study. The multifactorial etiological features of asthma lead to limitations in demonstrating the relationship between the duration and intensity of smoking exposure and the frequency and severity of the

disease. Despite all these limitations, the strength of our study is that it determines the frequency of exposure to secondhand smoking in early childhood asthma patients using real-life data.

CONCLUSION

Indoor smoking exposure should be considered a violation of children's right to a healthy life and should be considered a societal public health problem. Childhood asthma prevention strategies should cover the issues of preventing mothers from smoking, starting from the pregnancy period, as well as preventing the mothers' exposure to secondhand tobacco smoke. The harm due to smoking exposure during breastfeeding should be further emphasized and highlighted. We think that it would be beneficial to increase the awareness of clinicians, patients, and parents about passive smoking exposure, which is one of the most important obstacles against full control in asthma..

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was approved by the Dr. Sami Ulus Maternity and Children Training and Research Hospital Clinical Research Ethics Committee.

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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