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Does Corona Virus Impact the Prevalence of Asthma Exacerbation? About 208 Cases

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Abstract **Original Research Article**

Asthma is a chronic inflammatory airway disease resulting in reversible obstruction and hyperresponsive airways to various stimuli with recurrent symptoms. It is the most common chronic disease in pediatrics. In our study we try to analyze the impact of corona virus on prevalence and severity of asthma exacerbations ***Methods*:** we have conducted a descriptive, cross-sectional study that involved the records of children aged 6 months and older who were consulted for asthma exacerbation in the pediatric emergency unit of the children's hospital in Rabat, Morocco, during a 3-month period from November 2020 to January 2021. A total of 208 patients were included in the analysis. ***Result*:** 60% of known asthma patients had no asthma exacerbation, 10.8% between 1 and 2 exacerbation and a maximum of 5 exacerbation in 3.1% of children, and in the same period 18.5% of patients require hospitalization. ***In conclusion***: The prevalence of hospitalizations for asthma attacks is decreased during the quarantine period.

Keywords: Missing.

INTRODUCTION

Asthma is a chronic inflammatory airway disease resulting in reversible obstruction and hyperresponsive airways to various stimuli with recurrent symptoms. It is the most common chronic disease in pediatrics. Its prevalence in children in Morocco is 10 to 15% with an increase in autumn and winter [11]. Asthma exacerbation can engage vital prognosis. Respiratory viruses are major drivers of acute exacerbations of asthma [12]. As the world faces the coronavirus disease 2019 (COVID-19) pandemic due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, concerns have been raised that asthma patients could be at increased risk of SARS-CoV-2 infection and disease severity. However, it appears that asthma is not an independent risk factor for both [13]. During the months following the beginning of the pandemic, our study conducted in order to understand the relationship between the prevalence of asthma exacerbation and SARS-CoV-2 infection.

METHODS

This is a descriptive, cross-sectional study that involved the records of children aged 6 months and older who were consulted for asthma exacerbation in the pediatric emergency unit of the children's hospital in Rabat, Morocco, during a 3-month period from November 2020 to January 2021. A total of 208 patients were included in the analysis and the following parameters were analyzed for each patient: age and sex, medical history, history of respiratory discomfort, initial clinical examination data, and treatment undertaken. Children with another pathology associated with asthma were excluded from the study.

The evaluation of the severity of the asthma exacerbation was based on the GRAPP recommendations. The existence of personal atopy in the patients was considered when there was allergic rhinitis, atopic dermatitis or conjunctivitis in the child. The existence of familial atopy was considered when there was asthma, allergic rhinitis or eczema in the parents or siblings. Allergenic exposure was considered when carpets, rugs, animals, plants, cockroaches or molds were present in the patient's living space. Passive smoking was considered to be present in the case of exposure to parental smoking. Viral infection was suspected as the precipitating factor when a viral-like symptomatology preceded the occurrence of the asthma exacerbation.

Asthma control was assessed according to the criteria proposed by GINA 2020.

Patients with mild asthma attacks were treated in the emergency room, those with moderate asthma attacks were referred to the hospital ward and those with severe asthma attacks were admitted to the intensive care unit.

They were treated according to the department's protocol: prednisolone at a dose of 2 mg/kg/day without exceeding 60 mg/day for 5 days, nebulization with an oxygen source at 6 L/min of salbutamol at a dose of 0.15 mg/kg with a minimum of 1.5 mg and without exceeding 5 mg (up to 6 nebulization sessions spaced 20 min apart and then every 4 h) and oxygen therapy in case of oxygen saturation below 93%. Therapeutic education was offered to the children and their parents during the hospital stay

At discharge, patients received consolidation therapy: 2 puffs of inhaled salbutamol repeated 4 times daily for 5 days and oral corticosteroid therapy to complete 5 days of treatment.

RESULTS

During the period of study, the characteristics of the study population are shown in Table 1.

The mean age of patients was 4 years and 7 month, with 6 month as a minimum and 15 years as a maximum.

The sex-ratio was 1.35, with a male predominance.-The average age of onset of symptoms is determined to be 3 years and 2 month.

Asthma attacks are at their maximum inaugural. A personal atopy was found at 33% of cases and a notion of family atopy was found in 18% of patients.

A viral-like symptomatology preceded the occurrence of the asthma exacerbation founded in 42.1% of cases. Garden-type allergenic exposure concerned 29.4% of children; carpets concerned 64.7%, and food allergy 16.7% of children. Exposure to passive smoking was present in 23.5% of cases and active smoking was absent.

During the quarantine period against covid-19 which lasted from dates exactes March to June 2020, 60% of known asthma patients had no asthma exacerbation, 10.8% between 1 and 2 exacerbation and a maximum of 5 exacerbation in 3.1% of children, and in the same period 18.5% of patients require hospitalization.

The clinical symptoms included a dry nocturnal cough in 77.4% of the cases, tachycardia in 92.7% of the cases, polypnoea in 82% of the children, sibilant rales in all the patients with a percentage of 100%, signs of respiratory struggle in 82.5% of the cases. Most of our patients were apyretic with a percentage of 97.6%.

1% of patients had complications of asthma such as superinfection and 1 patient in our serie had pneumothorax requiring hospitalization in intensive care.

All children were treated with oral corticosteroids and bronchodilators. 83% were treated with salbutamol nebulization and 17% with inhaled salbutamol puffs. 1.9% of patients received H2 antihistamines and 1.5% received antibiotics.

Characteristics	**Number**	**Frequencies**
Male	133	64.4%
Female	74	35.4%
personal atopy	69	33%
Familial atopy	37	18%
frequency of known asthmatics	97	46.6%
Allergic rhinitis	59	28.4%
bronchoalveolite viral	145	70.1%
atopic dermatitis	4	1.5%
Passive smoking	49	23.5%

Asthma exacerbations of known asthmatique patients	number	FREQUENCIES
managed at home	126	62 %
requiring hospitalization	13	6.4%

DISCUSSION

Asthma exacerbations in pediatric represented a significant proportion of the reasons for consultation at the children's hospital in Rabat during the study period concomitant with the covid-19 period, that analyzes 208 consecutive visits for asthma exacerbations in our Pediatric Emergency.

According to what is described by Bekmezian *et al*., [3], male predominance was evident in our series. And several epidemiological studies have noted a higher proportion of hospitalizations for asthma exacerbation in boys at the preschool age.

Allergic rhinitis and either viral or bacterial infection have been found to be responsible for many asthma exacerbations, according to a study in Japan there was a close association between rhinitis and asthma in young children to adolescents [4], in our serie 28.4% of patients was with allergic rhinitis, Thus it is stated that the treatment of allergic rhinitis with oral corticosteroids allows better control of asthma exacerbation [5]. Although much childhood asthma is associated with atopy, the classic notion that the majority of exacerbations in atopic patients with asthma are related to allergen exposure with resultant inflammation has been challenged by a number of studies [8].

Also a viral-like symptomatology preceded the occurrence of the asthma exacerbation founded in 42.1% of cases in our study, so the importance of respiratory infectious agents, both viruses and bacteria, in the development of asthma exacerbations has been stressed by several authors [6, 7].

The existence of seasonal cycles of asthma exacerbations is well established, epidemiologic and clinical studies have long suggested that children frequently experience a worsening of asthma after return to school after the long summer vacation [9], also in winter, and in particular in December, the previous years, several series of cases have specified a peak of asthma exacerbation which coincides with the recrudescence of viral respiratory infections, in particular with rhinovirus [1], which was not the case in our study where we note a fall of asthma exacerbation, something that can be linked to the period of home confinement following the covid 19 pandemic, also with physical distancing and regular hand hygiene.

But asthma exacerbation and COVID-19 are difficult to differentiate clinically, Covid-19 has similar symptoms to asthma exacerbation, the most common presenting symptoms of COVID-19, dry cough and shortness of breathe which are also common with acute exacerbation of asthma. Fever is more commonly associated with COVID-19 but could be present with any infection-triggered exacerbation of asthma [2] in our serie during the pandemic, 60% of known asthma patients had no asthma exacerbation, 10.8% between 1 and 2 exacerbations, a maximum of 5 exacerbations in 3.1% of children, and in the same period 18.5% of patients require an hospitalization. Also a study notice and report an increase of asthma exacerbations during the survey period and their Asthma Control Test demonstrated good disease control. Alerts released by specialists, patient organizations and international societies advised patients with asthma to maintain adherence to their drugs, which may have increased patient compliance, favoring disease control and decreasing the risk of asthma exacerbation. The lockdown isolation imposed during the COVID-19 pandemic may have also reduced pollen exposure in subjects sensitized to late winter/spring pollen, reducing airway inflammation, In addition, social distancing measures may contribute to reducing infection and asthma exacerbation [10].

CONCLUSION

Asthma, with its high prevalence, particularly in childhood, its high economic burden, and its preventable exacerbations, is considered a disease of major public health importance by the World Health Organization.in our study there has been a significant reduction in attendance to primary care for asthma exacerbations during the pandemic. This reduction was observed in all age groups, both sexes. And can be explained by the control of the environment during this period and less exposed to viruses.

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