



Emergency Preparedness of Pediatric Asthmatic Patients in the Dental Setting

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Introduction

According to the 2021 National Health Interview Survey (NHIS) Data, 6.5% of children (age <18 years) in the United States currently have asthma.¹ Triggers of **extrinsic** asthma are specific allergens.² Common triggers of **intrinsic** asthma are stressful situations, viral infections, and extreme weather.³ The pathophysiology of an asthma attack is characterized by elevated serum interleukin-5 (IL-5) and interleukin-13 (IL-13) with airway eosinophilia which in turn cause bronchoconstriction and subsequent airway obstruction.⁴

The goal of treatment is to control the disease by reducing symptoms, preventing exacerbations, and restoring lung function. Contemporary asthma treatment uses combined therapies of low-dose inhaled corticosteroids as first-line therapy along with a short-acting beta agonist to reduce symptoms. Salbutamol (albuterol) is a short-acting beta agonist that is prescribed for quick relief of acute symptoms due to its potent smooth muscle relaxant properties as a bronchodilator.³

A dental procedure can introduce acute irritants to the airway of an asthmatic patient and consequently precipitate an attack.⁵ A dental procedure can also be a stressful event for patients with dental anxiety. Should an asthma attack occur in a dental office, use of albuterol is a critical step in the emergency management of an acute asthma attack. Before starting a dental procedure, the dentist should be aware of the patient’s condition: when the latest attack was, frequency and severity of the acute attacks, triggering agents, if and when the patient was hospitalized due to asthma, and what medication the patient takes.⁵

Purpose

To quantify the emergency preparedness of parents of pediatric asthma patients by determining who carries their child’s asthma rescue medication (albuterol) to dental appointments.

Results

A total of 31 questionnaires (n=31) were completed by parents and/or legal guardians of children with asthma. All children (100 percent) were diagnosed with asthma by a medical professional. All children (100 percent) were prescribed a daily medication and all children (100 percent) were prescribed an albuterol inhaler. Eight of 31 subjects (25.8 percent) reported bringing the child’s albuterol inhaler to the dental appointment. 16 out of 31 (51.6 percent) reported being instructed to keep the child’s albuterol inhaler with the child at all times. The correlation coefficient between the variables of albuterol brought to the appointment and last time albuterol was used was -0.1851 (r= -0.1851). The correlation coefficient between the variables of albuterol brought to the appointment and being told to carry albuterol at all times was 0.4235 (r= 0.4235)

Material & Methods

A prospective questionnaire was completed at the University of Toledo College of Medicine and Life Sciences Department of Dentistry Dental Service by surveying parents of patients with an asthma diagnosis as they were seen in the dental service for any dental appointment. Inclusion criteria were pediatric patients between the ages 6 to 10 years who are currently using a daily medication along with an albuterol inhaler as needed. The medical history of all patients in the dental service schedule were reviewed daily and those with an asthma diagnosis that met the inclusion criteria were approached to participate in the study. Assent from the child patient and consent for participation from the parent and/or legal guardian were obtained. Data analysis was completed utilizing descriptive statistics.

Average age of patients		
7.97 years old		
Daily Rx Name		
a. Budesonide (Pulmicort Flexhaler)	3/31=	9.68%
b. Fluticasone Furoate (Arnuity Ellipta)	0/31=	0.00%
c. Fluticasone Propionate (Flovent HFA or Diskus)	11/31=	35.48%
d. Budesonide with Formoterol (Symbicort)	6/31=	19.35%
e. Fluticasone with Salmeterol (Advair Diskus)	0/31=	0.00%
f. Montelukast (Singulair)	8/31=	25.81%
g. Other	10/31=	32.26%
Did you bring albuterol to the dental appointment		
Yes	8/31=	25.81%
No	23/31=	74.19%
Albuterol last used		
a. Within the last week	8/31=	25.81%
b. 2-4 weeks ago	8/31=	25.81%
c. 1-6 months ago	12/31=	38.71%
d. More than 6 months ago	3/31=	9.68%
Albuterol use reason		
a. Exercise-induced shortness of breath	11/31=	35.48%
b. Symptoms due to seasonal changes	19/31=	61.29%
c. Symptoms due to sickness	13/31=	41.94%
d. Other	2/31=	6.45%
Instructed to have albuterol at all times		
Yes	16/31=	51.61%
No	15/31=	48.39%

Discussion

The correlation coefficient between the variables of albuterol brought to the appointment and last time albuterol was used was -0.1851 (r= -0.1851). This low negative correlation may indicate that the severity of the disease is mild or if severe, patient symptoms do not increase the likelihood of the parent bringing the medication to the patient’s appointment.

The correlation coefficient between the variables of albuterol brought to the appointment and being told to carry albuterol at all times was 0.4235 (r= 0.4235). This may indicate that a recommendation from a healthcare provider to carry emergency medications at all times is somewhat effective.

For any future related studies, it would be helpful to collect information from pediatric pulmonologists. It would be interesting to collect data on pulmonologists’ recommendations for the use of albuterol prior to dental appointments and for carrying emergency medications to dental appointments.

A few variables could have caused the results of the study. The questionnaire given to the parent and/or legal guardian of the child may have been worded too vaguely when asking, “Did you bring your child’s albuterol inhaler today to this dental appointment?” Some parents may have inadvertently answered “yes” when, in fact, their child’s inhaler was in the car and not readily available. During the study, at least two parents verbally mentioned that their child’s inhaler was in the car. Since the parents’ responses on the questionnaires were unknown, the results could potentially be skewed. As a result, the actual percentage of participants prepared for an asthmatic emergency could be as low as 6 out of 31 participants (19.35%). In case of a real emergency, it would take approximately three to five minutes for a parent to get to the parking deck and then come back to the dental chair. As the questionnaire was given to the parent and/or legal guardian to complete on their own, the parent and/or legal guardian could have answered the questions falsely. If this study were to be repeated or continued, the questionnaire could be redesigned to ask the questions differently to leave little room for misinterpretation. Questions can also be asked verbally in a short interview format.

Conclusion

- 25.81% of parents of children with asthma, who require a daily medication and have a prescription for a rescue albuterol inhaler, brought the child’s rescue medication to dental appointments.
- 51.61% of parents of children with asthma, who require a daily medication and have a prescription for a rescue albuterol inhaler, reported that they were recommended to carry the child’s rescue inhaler at all times.
- Pediatric dental offices should have albuterol and other emergency medications used to treat an acute asthma attack since parents are mostly unprepared to manage such an emergency.

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