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A Review Paper on the Management of Food Allergies and Asthma in Schools

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ABSTRACT: ***Most of the schools will need to have strategies in place to handle children with food allergies and asthma as the incidence of these allergic diseases rises. Food allergy responses occur in schools in around 16 percent to 18 percent of the time, and include first-time reactions to food allergens. Children who have both a food allergy and asthma have a higher morbidity rate. Hospitalizations, asthma medication usage, and deadly anaphylaxis are all higher risks for these kids. Avoiding allergens lowers the risk of allergic reactions and asthma flare-ups. Oral allergen exposures are more likely to cause severe food allergy responses, while cutaneous and inhalation allergen exposures are less likely to cause severe allergic reactions. Action plans for food allergies, anaphylaxis, and asthma are tools that may be used in schools to assist guide the treatment of reactions and symptoms. The most important aspect of food allergy management is for the student to receive an accurate diagnosis and then work with their health-care provider to develop an anaphylaxis action plan.***

KEYWORDS: ***Allergy, Anaphylaxis, Epinephrine, Food Allergy, School Children.***

1. INTRODUCTION

Food allergies and asthma are both prevalent chronic illnesses that afflict 8% and 14% of school-aged children, respectively [1]. Food allergies in infancy are a risk factor for chronic, troublesome asthma. Furthermore, many children with food allergies and asthma are at a higher risk of deadly or near-fatal anaphylaxis, particularly if their asthma is poorly managed. Because children spend so much of their day at school, and the number of school-aged children with food allergies and asthma is on the rise, difficulties in managing allergic reactions/anaphylaxis and asthma at school are major concerns. Schools must be equipped to recognize and manage food allergies as well as asthma exacerbations. Food allergy and asthma management now focuses on avoiding triggers as well as recognizing and treating symptoms quickly. The distinction between a food allergy response and an asthma flare in children with asthma and concurrent food allergies is complicated, and it will be explored further.

1.1. Association between Food Allergy and Asthma:

Concomitant food allergy/sensitization and asthma are common, according to epidemiological research. In the national cooperative inner-city asthma study, 45 percent of children with asthma showed serologic evidence of IgE-mediated sensitivity to at least one of the six most prevalent food allergens [2]. In the National Health and Nutrition Examination Survey (NHANES), individuals with physician-diagnosed asthma showed a higher incidence of food sensitivity than those without asthma. In a major research of 18,000 asthmatic and 4,000 food allergic students, it was shown that 9.3% of asthmatic students also had food allergies, whereas 40.1 percent of food allergic students had asthma [3]. As a result, many children are afflicted by both diseases, and it is critical to explain how to treat both conditions at school.

Children who have both a food allergy and asthma develop asthma sooner and more often than children who do not have a food allergy. Symptomatic food allergy, which is defined as a history

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of response with positive test findings, was linked to asthma in both younger and older children in a study of 567 children conducted by Schroeder et al [4]. This link was much more pronounced in children who had numerous or severe food allergies.

1.2. Greater Burden of Disease in Children with Food Allergy and Asthma:

Several studies have shown that children with concomitant food allergies had higher asthma morbidity than those with asthma alone. Individuals with both asthma and food allergy had almost 7 times the chances of developing severe asthma, according to the NHANES research, compared to patients with asthma but no food allergy [5]. Children with life-threatening asthma who needed ventilatory support were more likely to have a history of food allergy than children with non-life-threatening asthma exacerbations, according to a case-control study of children aged 1 to 16 [6].

Children with concurrent food allergy and asthma have worse outcomes and use more healthcare resources, in addition to having a greater degree of illness. Asthma morbidity, pulmonary function, and resource usage were examined between children with asthma and those without food allergies in the Northeast-based School Inner-City Asthma group. Children with asthma with a food allergy had a higher risk of asthma hospitalization and controller drug usage. Those with numerous food allergies were more likely to be hospitalized, have asthma-related hospitalizations, use controllers, and see a health care practitioner.

A diagnosis of asthma also makes the prognosis for food allergies worse. Anaphylactic shock was found to be 109.0 per 100,000 person-years in the asthma cohort and 19.9 per 100,000 person-years in the referent cohort in a study of 526,406 individuals with asthma and a matched reference cohort without asthma [7]. Asthma was linked to a 5.2-fold higher risk of anaphylactic shock from food allergies in one research. Similarly, a UK research of people aged 10 to 79 years found that those with asthma had a more than doubled risk of anaphylaxis compared to people without asthma, with medications and food being the most frequent causes of anaphylaxis in this group. Other studies have shown asthma to be a risk factor for deadly food anaphylaxis, but fatal responses are uncommon.

1.3. Effect on School-Aged Children:

Food allergies and asthma have a broad impact on school-aged children. Food allergies may strike at any time, and about 16 percent to 18 percent of children with food allergies have had responses at school [8]. Up to 25% of children who develop an allergic response at school are completely ignorant of the danger they are in. In schools, the majority of responses occur in the classroom (79 percent-83 percent) and in the lunchroom (12 percent to 15 percent). Other places where people respond include school field excursions, playgrounds, and bus rides to and from school. Food allergies affect school attendance and social participation as well. Food allergy had an impact on school attendance (34 percent), parties (68 percent), and field excursions, according to a survey of caregivers of food allergic children (61 percent). Food allergies may also impact social activities like birthday parties and sleepovers, which can lead to anxiety and isolation from other kids.

Asthma affects a large number of school-aged children. Asthma is the leading cause of school absenteeism and poor academic performance, with 10 million students missing school each year. In a research including 1,715 adolescents from a Swedish population-based birth cohort, asthma, particularly poorly managed asthma, was linked to worse academic performance. Increased

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asthma symptoms were linked to reports of attention-deficit/hyperactivity syndrome symptoms and poor performance on concentration and attention activities in school-aged children. Asthma that isn't well managed may impede socializing during recess or other activities that demand physical effort.

Another significant problem for children with food allergies and asthma is bullying. According to one research, a quarter of food allergy children have been bullied, with the majority of these incidents (82%) occurring at school and 80 percent being committed by peers. Specifically, 21% of students reported being ridiculed or harassed by instructors or school personnel. Asthmatic children are more likely than non-asthmatic students to report bullying at school (15.6 percent vs. 10.2 percent) and in cyberspace (17 percent vs 11 percent). As a result, school staff should be aware that children with food allergies or asthma may be harassed, and such incidents should be handled appropriately.

2. DISCUSSION

2.1. Guidelines for School Management of Food Allergies and Asthma:

The creation of school health management strategies is important since both asthma and food allergies may induce potentially life-threatening responses. This paper summarizes management recommendations for food allergies and asthma. Parents must notify their child's school about their child's medical issues, supply proper medicines when required, and contact directly with responsible people, such as the teacher and school nurse, to acquaint and educate them with food allergy and asthma treatment. Although parents play an important part in the education of school personnel, school administrators also have access to a variety of other resources.

Organizations such as the American Academy of Pediatrics (AAP), the Centers for Disease Control and Prevention (CDC), and the National Heart, Lung, and Blood Institute have guidelines for managing food allergies and asthma in schools (NHLBI) [9]. These organizations offer evidence-based suggestions that may be implemented in classrooms and tailored to the specific requirements of each kid. However, there are no particular recommendations for the treatment of children who have both a food allergy and asthma.

The CDC's voluntary food allergy management recommendations concentrate on assuring daily management of food allergies in individual children, planning for food allergy emergencies, providing professional development for staff members on food allergies, and establishing a safe and healthy educational environment. Hand cleaning before touching or eating food, not permitting food eating on buses, avoiding the use of potentially allergenic materials in class, and considering dedicated allergy-friendly seating configurations are all further precautions.

2.2. School Training for Food Allergy and Asthma Management:

Food allergy responses and asthma exacerbations may be treated quickly if symptoms are recognized and prepared. According to one research, the teacher was the first adult to notice food allergy responses in 59 percent of instances. As a result, all school personnel should be taught to identify and treat symptoms. Available statistics, however, show that who gets anaphylaxis training in schools and who is allowed to give emergency medicines (epinephrine) for allergic responses varies. According to studies, school personnel and instructors are unaware of asthma treatment policies and procedures.

In recent years, there has been an increase in the number of studies on food allergy management in schools. At a poll of Colorado school nurses, 80% said that staff members in their schools had

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undergone anaphylaxis training, however only 50% said that training lasted less than 30 minutes [10]. However, epinephrine was administered at least once by unlicensed personnel who may or may not have received training, according to a total of 10% to 20% of survey respondents. Similarly, a nationwide survey of school nurses found significant variations in staff training and anaphylactic preparation throughout the country.

More research has been done on school staff asthma awareness and training. Lack of understanding of how to recognize students with respiratory problems, lack of teacher knowledge of asthma management guidelines, inadequate access to asthma medication in school, lack of comfort with management, and limited communication among school staff were among the barriers to proper asthma management in schools identified by a study of 21 elementary teachers in the Bronx, New York. In a separate survey of 162 school nurses in North Carolina and South Carolina, 45 percent said they had access to age-appropriate asthma education materials, but only 16 percent said their schools had implemented asthma education programs, with a statistically significant higher rate of training in urban than rural settings. Future efforts should be made to overcome these obstacles and offer appropriate training for teachers as well as other school personnel.

2.3. Allergen Avoidance and Considerations in Food Allergy:

Ingestion is the major route of exposure that causes severe allergic responses, thus allergen avoidance remains the cornerstone of food allergy treatment. In the US Peanut and Tree Nut Allergy Registry research, ingestion was responsible for 60% of responses, skin contact exposures or potential ingestions for 24%, and inhalation or possible skin contact or ingestions for 16%. As a result, when it comes to food allergy avoidance at school, the focus should be on reducing the risk of ingesting exposures.

Peanut exposure through skin contact or inhalation has been shown to have a minimal risk of serious systemic effects in previous investigations. In a trial of 30 children with a history of peanut allergy, none had a systemic or pulmonary response after undergoing contact and inhalation challenges. Only skin complaints were seen at the location of peanut butter skin contact. A bigger research that looked at touch responses included 281 kids, some of whom experienced systemic reactions when they were given an oral meal challenge. Under occlusion, peanut butter was administered directly to the skin for 15 minutes. In 41% of the 330 applications, localized responses were seen, but no kid had a systemic reaction as a consequence. Similarly, no detectable Ara h 1 or Ara h 2 was found in air samples taken while shelling raw and roasted peanuts, pouring peanut flour, or opening peanut butter jars. As a result, systemic effects via skin contact or inhalation are very rare. Because heating items like milk or fish may generate aerosolized particles that can cause allergy or asthma symptoms in those who are close to the cooking area, allergic students should avoid participating in these activities.

Staff members may also assist by reviewing warning labels on a regular basis and cooking with allergens in mind. Ingredients and advisory labels on prepackaged food items used in the classroom should be examined. Staff should be educated on safe food preparation and handling procedures at schools that prepare meals. Meals, snacks, celebratory foods, and even certain objects used in class activities may all be sources of food allergies. Allergies have been linked to hidden allergens discovered in craft projects and scientific investigations. Peanut butter art projects were shown to be a frequent source of contact (44%) and inhalation (41%) responses in one research. Finger paint (egg), paste (wheat), play dough (wheat), and macaroni are all

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possible sources of hidden allergies (wheat and egg). As a result, instructors should be aware of a student's sensitivities, be aware that allergens may be present in certain classroom materials, and utilize safe substitutes. Older children may be taught about possible allergy sources and encouraged to advocate for themselves as developmentally appropriate, since these skills are useful outside of the classroom.

2.4. Allergen Avoidance in Asthma:

In asthma treatment, avoiding common allergy and non-allergen triggers is essential. Chalk dust, cigarette smoke, and strong smells (markers, pesticides, paints, etc.) may all cause problems in schools. Animal dander, dust, cockroaches, and mice are common indoor allergens that may cause symptoms in asthmatic kids. Changes in weather, such as increased humidity, thunderstorms, and cold temperatures, may exacerbate asthma symptoms, therefore spending less time outdoors in these circumstances may be necessary. Exercising and engaging in physical activity may also provoke asthma symptoms, particularly when combined with the aforementioned factors, which can lead to an exacerbation. A short-acting agonist should be provided before and during exercise in students with exercise-induced asthma, and physical activity should be reduced if necessary.

2.5. Treatment:

Food allergy and asthma patients are at risk for poor outcomes; thus, both diseases should be properly treated and controlled to avoid possible morbidity and death. Individualized emergency care plans are suggested, which notify school staff of a student's particular allergy triggers and offer treatment advice in the event of allergic responses or asthma exacerbations. Most food allergy emergency action plans include a checkbox for an asthma diagnosis, highlighting the increased risk of severe reactions and anaphylaxis in those with asthma. These strategies, as well as medicines, including epinephrine autoinjectors and b-agonists, should be given to schools.

Only 50.9 percent of children with food allergies and 24.3 percent of students with asthma had a school health management plan on file, according to one research, with rates being lowest among ethnic minorities and low-income families. Students with asthma and food allergies were more likely to have a school health management plan, although only 56.7 percent of them did. Parents and school staff should be comfortable with execution of these action plans, which should be evaluated with a physician and revised as needed on an annual basis.

The CDC also advises that epinephrine autoinjectors be readily accessible and that these medicines be kept on hand to address responses that may occur throughout the school. For the school year, every kid with food allergies should bring an epinephrine autoinjector that has not expired. Stock epinephrine may also be used as a supply of medicine, particularly for individuals who forget their prescriptions, have outdated supplies, or have no previous history of food allergies. Only 12 states mandate schools to carry epinephrine, despite the fact that the School Access to Emergency Epinephrine Act was signed into law in 2013. Except for Hawaii, the other states have legislation or guidelines that allow but do not mandate stocking epinephrine. Many of these rules provide no advice on how to acquire, maintain, or pay for these medicines, thus it is up to individual schools to make these choices. According to the aforementioned survey research on school medicines, almost half of the stock epinephrine was given by a pharmaceutical firm, with just 30% bought using district money. There hasn't been any research done on the impact of these stock epinephrine recommendations on food allergy management in schools.

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3. CONCLUSION

With the increasing prevalence of food allergies among children, it is critical that schools, families, and communities be informed and taught on food allergy safety. School-based partnerships that concentrate on integrated care coordination among families, practitioners, and school staff are needed to improve health and school-related outcomes for children with food allergies and asthma. This coordinated approach is critical for children with food allergies and asthma to successfully transition to school. Aside from avoiding food allergy and asthma triggers, the school must be prepared to identify and treat the signs of allergic responses and asthma exacerbations. Individual emergency plans provide schools advice suited to a student's particular requirements, and having medicines on hand to address symptoms enables for prompt treatment of responses and exacerbations. Managing allergic illnesses at school may be difficult, but there are a variety of tools and recommendations available to help families, health care providers, and schools.

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