Ann Allergy Asthma Immunol xxx (2016) 1–5

Contents lists available at ScienceDirect

Food allergy needs assessment, training curriculum, and knowledge assessment for child care

Bruce J. Lanser, MD [*]; Ronina Covar, MD [*]; J. Andrew Bird, MD [†]

[*] National Jewish Health & University of Colorado School of Medicine, Denver, Colorado
[†] University of Texas Southwestern Medical Center & Children's Medical Center, Dallas, Texas

ARTICLE INFO

Article history:
Received for publication January 4, 2016.
Received in revised form March 25, 2016.
Accepted for publication March 27, 2016.

ABSTRACT

Background: More than half of preschool-aged children are enrolled in child care in the United States. Roughly 8% of children between 3 and 5 years of age have a food allergy. Child care center workers (CCCWs) are important caregivers who frequently encounter food allergies, but little is known about their education and understanding of food allergy and anaphylaxis.

Objectives: To perform a food allergy and anaphylaxis educational needs assessment, provide a training curriculum for CCCWs, and assess the effectiveness of the training curriculum.

Methods: An online educational needs assessment and live training curriculum addressing food allergy recognition, treatment, and food labeling with pretests and posttests were created, and content and face validity were obtained. A needs assessment survey was sent to centers in Dallas and Tarrant counties. The training curriculum was performed at continuing education conferences.

Results: Seventy-three workers responded to the needs assessment, with 46% reporting prior food allergy training. They reported information sources as parents (73%), self (54%), educational curricula (21%), and conferences (19%). Most believed they have a high or moderately high proficiency in food allergy management. Forty-five workers participated in the training curriculum. Total scores improved from 54% correct on the pretest to 83% correct on the posttest ($P < .001$). Categorical subanalysis reveals similar results, with statistically significant improvement in all areas.

Conclusions: CCCWs have diverse educational backgrounds and infrequently experience standardized training about food allergies. There is a significant lack of knowledge regarding food allergies and anaphylaxis. The curriculum was successful at increasing food allergy knowledge among CCCWs.

Introduction

Food allergy affects approximately 8% of children in the United States.[1] Egg and milk allergies may be persisting longer today than previously observed.[2,3] Food is the most common cause of anaphylaxis in children, and emergency department (ED) visits for food-induced anaphylaxis are increasing, having doubled between 2001 and 2006 at 1 academic pediatric ED.[4] The US Peanut and Tree Nut Registry found that most reactions in their sample (64%) occurred in daycare or preschool, and 25% of these were first-time reactions.[5] With more than half of preschool-aged children enrolled in child care, child care center workers (CCCWs) are an important group caring for children, and their knowledge regarding caring for children with food allergies is unknown.[6]

There are several unique challenges for managing food allergies in child care centers. Centers often rely on medication provided by parents for allergies, including epinephrine, because entity laws have not been passed in all states. Entity laws enacted in some states for common use epinephrine only apply to schools but may not provide direct guidance or standards for child care centers. Much focus has been given to educating caregivers in the school setting, with well-developed recommendations. Although child caregivers are included in the 2013 guidelines of the Centers for Disease Control and Prevention, most recommendations apply to schools, and much of the information is not applicable to child care centers with fewer resources.[7] The Australasian Society of Clinical Immunology and Allergy has published guidelines for prevention of food anaphylactic reactions in schools, preschools, and child care

Reprints: Bruce J. Lanser, MD, National Jewish Health, 1400 Jackson St, J322, Denver, CO 80206; E-mail: lanserb@njhealth.org.

Disclosures: Dr Bird received research support from Aimmune Therapeutics, DBV Technologies, and Food Allergy Research and Education and has received lecture fees from Nutricia North America. No other disclosures were reported.

Funding Sources: This study was funded by the University of Texas Southwestern Medical Center, Department of Pediatrics.

http://dx.doi.org/10.1016/j.anai.2016.03.031

centers, but the recommendations for child care are again limited and unlikely to be accessed by many US child care centers.[8] There is a high rate of turnover of CCCWs, and significant educational and experiential variability among these workers.[9] Progress has also been made in providing resources for pediatricians and parents to teach themselves and to educate other caregivers.[10,11] However, little work has been performed to systematically provide these same resources to CCCWs.

The only previous study to evaluate child care center food allergy awareness was published in 2005 with the results of follow-up surveys after intervention published in 2006.[12,13] A telephone survey of 42 child care centers in suburban Chicago found that of the 48% of centers that had epinephrine available (provided by parents), only 55% of CCCWs were trained to recognize a reaction. Even more concerning is that only 24% responded that they would administer epinephrine (EpiPen). The follow-up survey was designed to assess retention from an intervention seminar focusing on when and how to administer epinephrine (EpiPen; Mylan Inc, Canonsburg, Pennsylvania). The initial postseminar assessment revealed that it was effective, with 77% of participants following the steps of intramuscular epinephrine administration correctly. However, at 6- and 12-month follow-up, only 48% and 31% of participants, respectively, were able to perform the steps correctly. A multicenter prospective study specifically evaluated allergic reactions in preschool-aged children.[14] Teachers and school nurses treated only 3.4% and 0.2% of reactions, respectively, whereas parents treated more than half. Among all caregivers in this study, only 29.9% of severe reactions were treated with epinephrine, with reasons for not using epinephrine including failure to recognize a reaction (47.7%), epinephrine unavailable (23.1%), and fear (12.3).

Although there are limited published data regarding knowledge of food allergies among CCCWs in the United States, these studies suggest that CCCWs are not following recommendations regarding food allergy management, and they may not be equipped to recognize and treat a reaction. Given these concerns and limited data, we sought to ascertain the educational needs of CCCWs in the Dallas–Fort Worth metroplex and provide education covering topics critical to understanding food allergies and anaphylaxis.

Methods

Participation in all stages of the study was voluntary and anonymous. The University of Texas Southwestern Medical Center Institutional Review Board approved the study. The study was deemed to be exempt, and written informed consent was not obtained. Verbal assent was performed at the beginning of each session.

Needs Assessment

A needs assessment survey was developed by a group of pediatric food allergy experts, including nurses, physician assistants, pediatric residents, and pediatric allergists. The survey (eTable 1) consists of 19 questions on demographics and center characteristics, experiences with allergic reactions, preferred learning methods, self-assessment of food allergy knowledge and comfort, and educational needs and interest in learning more about food allergies. A focus group was convened to achieve content and face validity, consisting of 5 CCCWs and directors, a school nurse, and a parent of a child in child care with food allergies. Each question was systematically reviewed with the group in detail. The focus group revealed that the needs assessment was easy to understand and of reasonable length. Most participants were able to complete the survey within 10 minutes.

After minor adjustments were made based on focus group feedback (eg, word changes for better understanding as in cross-contamination from cross-contact and adding the category of learning from families about food allergy), the survey was modified into an online format using SurveyMonkey. A link to the anonymous online survey was e-mailed to 818 licensed child care centers in Dallas and Tarrant counties, using addresses publicly available from the Texas Department of Family and Protective Services, which licenses child care centers. Centers were excluded if they did not care for children between the ages of 1 and 5 years. By definition, licensed centers in Texas are not family- or home-based child care and, at the time of this survey, cared for 10 or more children. One reminder e-mail was sent to any e-mail address at which no one had completed the survey.

Training Curriculum

On the basis of the results of the needs assessment, an educational curriculum was developed with input from the same experts. They identified topics considered to be important for caregivers to understand food allergies, recognition of the signs and symptoms of an allergic reaction and anaphylaxis, treatment, food-labeling laws, and strategies for avoidance of food allergens. The training curriculum also included a discussion of the use and utility of having a food allergy and anaphylaxis action plan for each child and the rationale for having 2 autoinjectors for each child. A hands-on demonstration of how to use an epinephrine autoinjector was performed at each session, with each participant practicing with the autoinjector trainer. The trainers were also available for each participant to take with them and share with other workers at their center.

The hour-long presentation was piloted with the same focus group, with overwhelmingly positive reviews. The group requested a discussion of the responsibilities of the child care center and those of the parents of a child with food allergies, which was added to the presentation. Once finalized, the educational curriculum was offered by the then pediatric resident with experience in food allergy (B.J.L.) and assisted by a pediatric food allergist (J.A.B.) at regional child care licensing conferences for continuing education credit and completed by 45 CCCWs.

Knowledge Assessment

A knowledge assessment test was developed based on the content of the training session. The test (eTable 2) contains a mix of 18 multiple choice and true or false questions. It was administered anonymously to all participants before and after the training session. The test sought to ascertain the participant's knowledge of food allergy in the following 4 areas: understanding food allergies, recognizing an allergic reaction, treatment of a reaction, and food-labeling laws. The focus group also reviewed the test for content and face validity, and all questions were reviewed as appropriate and understandable. Test results were analyzed using JMP statistical software, version 10.0.0 (SAS Institute Inc, Cary, North Carolina). The mean percentage of correct scores on the pretest and posttest were compared by *t* test for all questions and categorical subgroups. Results were not compared before and after testing for each participant, but data were pooled. The test was also emailed to participants 6 months after the training session; however, no participants completed the follow-up test.

Results

Needs Assessment: Demographics

The survey was completed by 72 centers, for an 8.8% completion rate. An additional 22 participants completed the needs assessment survey on paper at the training sessions. Table 1 lists the demographic information for the 93 respondents to the needs assessment survey. Of these, 70 (76%) worked at a large center, caring for more than 50 children, and half of these (47 of 93) were