

Nut allergy in schoolchildren: a survey of schools in the Severn NHS Trust

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Aims: To assess the extent of the problem of nut allergy in schoolchildren within the Severn NHS Trust. To determine how well informed schools are about the condition, their policies and attitudes, and the action that would be taken in the event of an acute reaction.

Methods: A questionnaire addressed to the head teacher was sent to 100 randomly selected mainstream schools in the Severn NHS Trust.

Results: Response rate was 83%. There were a total of 21 868 pupils in the schools. Forty five (54%) schools had at least one child currently known to be allergic. The total in all the schools was 87 (0.4%). Only 31 (36%) children had medication available in school. Of these, 18 (58%) had EpiPen alone. Twenty schools (44%) with an allergic child either had no staff trained to administer medication or did not respond to the question. Two (4%) schools with an allergic child had a support assistant for the pupils. Only 19 (43%) schools with a nut allergic child gave information to all teachers about nut allergy and only 21 (47%) gave information to dinner supervisors and other assistants. In only 23 (51%) schools with an allergic child were the cook and catering staff aware of all the children with a nut allergy. Ten (22%) schools with an allergic child served only "nut free dinners". Fourteen (31%) schools with a nut allergic child could not name a single sign of a mild acute allergic reaction (compared to 34 (89%) schools without an allergic child). Fifteen (33%) schools with an allergic child could not state a single sign of a severe acute allergic reaction (compared with 33 (87%) schools without a nut allergic child).

Conclusion: Schools are not sufficiently well informed about nut allergy and management of acute allergic reactions. Policies and attitudes vary. We have revised the information given to schools regarding nut allergy and prepared a new information pack.

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The incidence of nut allergy, and in particular peanut allergy appears to be increasing.¹ Peanut allergy is the most common cause of fatal and near fatal reactions to food.²

Estimated prevalence of sensitisation to peanuts is quoted at 1.3%.³ This can occur at a very young age and is usually lifelong.³

Peanuts are found in a surprising variety of foods including icing, deserts, jellies, mince pies, curries, breakfast cereals, vegetable burgers, vegetable oils,⁴ and many foods that children may eat or share in school. In one study of fatal and near fatal anaphylactic reactions to food, two thirds of reactions occurred at school.⁵ Children are most at risk at break and lunch times, at parties, on school trips (sharing snacks and treats), and during cookery, art, and science lessons. It is essential that staff are well informed about the condition and effectively trained in the management of medical emergencies relating to nut allergy and anaphylaxis.

The Community Paediatric Department in the Severn NHS Trust, as in most other health authorities, offers written information to schools with a child suffering from nut allergy. Allergic children are identified from medical records or when the school informs the department. In order to maintain an accurate record of affected children, it is essential that parents inform schools about allergic children and that in turn the schools (or parents) inform the School Health Service. A school entry health questionnaire is completed by parents and returned to the school nurse, but there is no specific question regarding allergies. Schools also require forms with emergency contact numbers and current medical problems to be completed. A school nurse provides training to schools on the prevention of exposure, recognition of symptoms of acute allergic reactions, and the administration of appropriate

medication. Whether the information provided was effectively retained and used by the schools remained untested before we conducted this survey.

The aim of this study was to determine the extent of the problem of nut allergy in school children within the Trust, how well informed schools are about the condition, the attitude of the schools to the problem, local school policies, and measures being taken to prevent exposure in school. We inquired about the action that would be taken by the schools in the event of a child having an acute reaction and how well prepared they are to deal with an emergency. In light of the results, we reviewed the information that we were providing and its dissemination.

METHODS

Altogether there are 296 mainstream state schools within the Severn NHS Trust. Of these 254 are primary schools and 42 are secondary schools.

A questionnaire addressed to the head teacher was sent to 100 randomly selected mainstream schools in the Severn NHS Trust. (The questionnaire can be viewed on the ADC website.) The head teacher was requested to complete the questionnaire and liaise with appropriate members of staff as necessary. Completed questionnaires were returned by post. The results were analysed and where appropriate the χ^2 test was used.

RESULTS

Eighty three schools returned a completed questionnaire. Eleven (13%) completed questionnaires were from secondary schools and 72 (87%) from primary schools. The total number of children in the 83 schools was 21 868.

Table 1 Staff trained to administer medication in school

Staff trained to administer medicine in school	No.
All staff	3
All teachers	4
All teachers and first aiders	3
All teachers/secretary and midday supervisors	1
Teachers and school secretary	1
One teacher	1
The secretary	1
First aiders	5
Teacher and office staff	1
Head teacher and school secretary	1
Welfare assistants	1
NNEB	3
Total number of schools with trained staff	25
Total number of schools with no staff trained	20
Total number of schools	45

Children known to be allergic to nuts

From the questionnaire, 45 (54%) schools had at least one child who was currently known to be allergic to nuts. The total number of children known to have a nut allergy in these schools was 87 (0.4%).

From our computer records only 27 (33%) schools had at least one child who was currently known to be allergic to nuts. A total of 42 children were registered. Twenty three of the 45 schools that had a nut allergic child according to their questionnaire response were not registered on the computer. Five schools that had at least one child registered on the computer database did not state in the questionnaire that they had a nut allergic child.

Medication available in schools

Of the 87 children currently known to have a nut allergy, 31 (36%) had medication available in school. Of these, 18 (58%) had EpiPen alone, 3 (10%) had EpiPen and Piriton, one (3%) had EpiPen, Piriton, and Ventolin, one (3%) had EpiPen, Clarityn syrup, and Ventolin, one (3%) had Piriton alone, one (3%) had Piriton and Ventolin, one (3%) had Zirtek tablets, and five were not stated. Medication was stored in various places in the schools. Twenty five schools with medication in school stated where medication was stored. Nine (36%) stored medication in the school office, three (12%) stored it in the secretary's office, four (16%) in the classroom or office, three (12%) in the child's class, one (4%) in the First Aid box, one (4%) in the stock cupboard, two (8%) asked the pupil to keep it, one (4%) kept it in a corridor cupboard, and one (4%) in a "red labelled satchel".

Staff trained to administer medications

In 25 (56%) of the 45 schools with a nut allergic child, at least one person was trained to administer medications. Of the 25 schools with at least one trained staff member, in eight (17%) schools only one person was trained, in four (9%) two people were trained, and in 13 (28%) more than two people were trained.

Twenty schools (44%) with a nut allergic child either had no staff trained or did not respond to the question. Five schools who had no staff trained to administer medications had at least one child who had medication, and in two of the schools a pupil was prescribed EpiPen for use in school. Table 1 lists staff trained to administer medications.

Staff trained to administer EpiPen

Fifteen schools had at least one child with EpiPen in school. In eight (53%) of the 15 schools with children having EpiPen in

school, the school had four or more members of staff trained to give the EpiPen. One school had two people, two schools had one person, and two schools had no members of staff trained. Two responses did not specify the numbers of staff trained.

Only two (4%) schools with a nut allergic child had a support assistant for allergic pupils. These were not specifically for these pupils alone or present full time.

Information given to staff

When asked whether they gave information to all teachers about nut allergy, only 19 (43%) schools with a nut allergic child said they did. Twenty one (47%) schools with an allergic child gave information to dinner supervisors and other assistants regarding nut allergy. In 23 (51%) schools with an allergic child the cook and catering staff were aware of all the children with a nut allergy.

Insurance cover

Fifteen (33%) schools with a nut allergic child were aware that their insurance adequately covered them to administer medication. Six (13%) thought it did not and 24 (53%) did not know if it did.

Awareness of the potential seriousness of nut allergy reactions

Thirty nine (87%) schools with a nut allergic child were aware that nut allergy is potentially life threatening. Three (7%) disagreed and the remainder were uncertain.

Dealing with an emergency

Only 22 (49%) schools with a nut allergic child were confident that they could deal with an emergency arising from a child suffering from an acute allergic reaction in school. Fifteen (33%) did not feel confident and eight (18%) were uncertain.

Thirty two (71%) schools with a nut allergic child felt that national guidelines regarding the management of nut allergy in school would be helpful, seven (16%) disagreed, and the remainder had no view either way. Only 13 (30%) schools with a nut allergic child felt that teachers were adequately informed about nut allergy in schoolchildren.

Fifteen (33%) schools with a nut allergic child felt that the available written local guidelines were sufficient to help them deal with the problem of nut allergy in schoolchildren.

School policy regarding nuts on premises and nut free dinners

Only eight (18%) schools with an allergic child said that it was school policy not to allow nuts in school. Ten (22%) schools with a nut allergic child stated that they served only "nut free dinners" at school. Only two (4%) schools without an allergic child did not allow food with nuts, nut oils, or nut traces into school.

Signs of mild acute allergic reaction

Schools were asked to list the signs of a mild acute allergic reaction. The most frequently mentioned signs by schools with an allergic child were rash, stated by 12 (27%) schools, difficulty breathing, stated by 16 (36%), and swelling, stated by 16 (36%). Fourteen (31%) schools with a nut allergic child could not name a single sign of a mild acute allergic reaction. This compares to 34 (89%) of schools without a known nut allergic child ($p < 0.0001$).

Signs of severe acute allergic reaction

Schools were also asked to list signs of a severe acute allergic reaction. The most frequently mentioned signs by schools with an allergic child were difficulty breathing, stated by 17

NAME: _____ DATE OF BIRTH: _____ child's PHOTO
 I AGREE TO THE ACTION PLAN.....parent/guardian
 LOCATION OF EPIPEN AND PIRITON _____

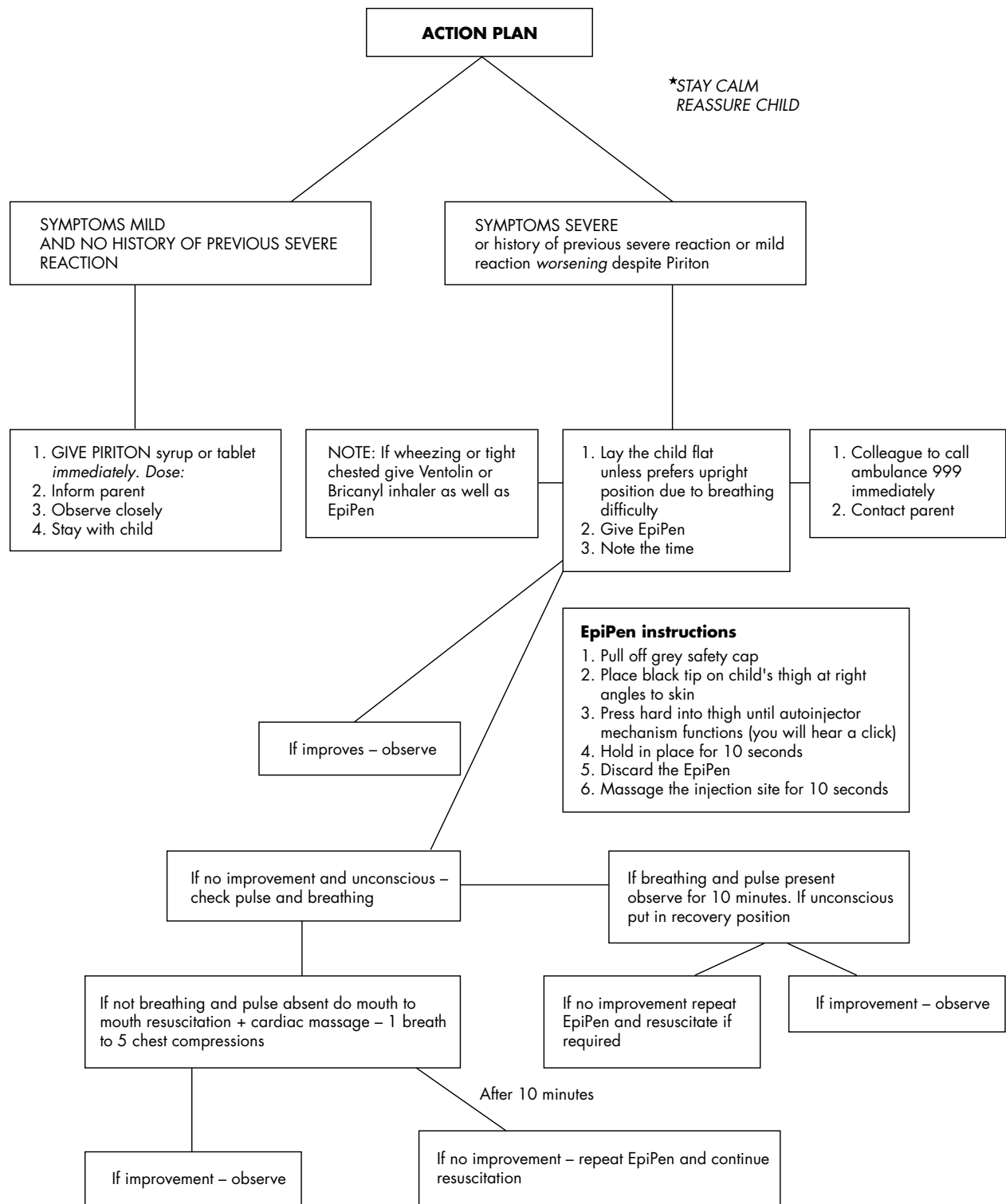


Figure 1 Emergency treatment of acute allergic reaction: action plan in flow chart format.

(38%) schools, and swelling, stated by 10 (22%). "Faint or collapse" was mentioned by five (11%) schools, unconsciousness by seven (16%), and anaphylactic shock by five (11%). Fifteen (33%) schools could not state a single sign of a severe acute allergic reaction. This compares with 33 (87%) schools without a nut allergic child ($p < 0.0001$).

Management of acute allergic reactions in schools with a nut allergic child

Schools were asked about the action that they may need to take in the event of an acute allergic reaction in school. Of the schools with an allergic child, 22 (49%) schools would contact a parent, 15 (33%) would administer EpiPen injection (all

NAME:

DATE OF BIRTH:

PHOTO

I AGREE TO THE ACTION PLAN (PARENT/GUARDIAN)

LOCATION OF 'EPIPEN' AND PIRITON:

MILD SIGNS AND SYMPTOMS:

ITCHY, TINGLING MOUTH, METALLIC TASTE,
RASH AND ITCHING, LOCAL OR GENERALISED
FLUSHED FACE, NECK OR GENERALISED
ABDOMINAL PAIN/DIARRHOEA/VOMITING
ANXIETY
TIREDNESS

ACTION:

1. GIVE PIRITON SYRUP – NOTE THE TIME
 2. INFORM PARENT/GUARDIAN
- FIRST CONTACT
HOME: WORK:
SECOND CONTACT
HOME: WORK:

IF MILD SIGNS WORSENING OR MORE SEVERE SYMPTOMS:

SWELLING FACE/NECK/THROAT
HOARSE VOICE/COUGH
DIFFICULTY BREATHING OR SWALLOWING
DIZZY/FAINT
BLUE COLOUR TO LIPS
RAPID WEAK PULSE
COLLAPSE
LOSS OF CONSCIOUSNESS

*Note: asthmatics can have
their inhalers as well as EpiPen
if wheezing or tight chested*

ACTION:

1. RING FOR AMBULANCE 999
STATE "CHILD SUFFERING FROM ANAPHYLACTIC SHOCK"

NOTE TIME

2. IF POSSIBLE LIE CHILD FLAT
ACTIVATE "EPIPEN" AUTOINJECTOR:
PULL OFF GREY SAFETY CAP
PLACE BLACK TIP ON CHILD'S THIGH AT RIGHT ANGLES
TO SKIN (THROUGH TROUSERS IF NECESSARY)
PRESS HARD INTO THIGH UNTIL MECHANISM FUNCTIONS
(SUDDEN LOUD CLICK)
HOLD IN PLACE FOR APPROX. 10 SECONDS
DISCARD THE EPIPEN SPENT UNIT SAFELY
MESSAGE INJECTION SITE FOR 10 SECONDS

- ◆ IF CHILD UNCONSCIOUS, TURN ON TO LEFT SIDE AND EXTEND NECK TO MAINTAIN AIRWAY. IF NOT BREATHING AND PULSE ABSENT DO MOUTH TO MOUTH RESUSCITATION AND CARDIAC MASSAGE
- ◆ IF NO IMPROVEMENT AFTER 10 MINUTES – REPEAT EPIPEN AND NOTE TIME FOR AMBULANCE STAFF

Figure 2 Emergency treatment of acute allergic reaction: alternative presentation of action plan.

those with EpiPen available in school), five (11%) would administer antihistamines. Twenty five (56%) would ring 999 for an emergency ambulance, four (8%) would phone the general practitioner (GP) or hospital, and seven (16%) would take the child to hospital or to the GP. Only

eight (18%) schools mentioned the possibility of doing cardio-pulmonary resuscitation. Nine (20%) schools did not state or did not know what they would do in the event of an emergency of this kind. One school said that they would ask the child.

DISCUSSION

Just over half of the schools we surveyed had at least one child who was known to be allergic to nuts. From our survey, the estimated prevalence of nut allergy in schools within the Severn NHS Trust was lower than the estimated population prevalence in the literature (0.4% v 1.3%).³ This suggests that many affected children remain as yet unidentified. Either the allergy has not yet been detected or parents are failing to inform the schools. Significantly fewer children were registered on our computer records as having a nut allergy compared to the results from the survey. This indicates either that in some cases schools and parents fail to inform the School Health Service about affected children or that our record keeping is inaccurate. In order to identify all children known to be allergic to nuts, we have encouraged staff to inform the School Health Service and have also included a specific question regarding allergies on the school health questionnaire. Our computer records will be updated regularly. Training may then be arranged as appropriate.

Although nut allergy in children and young people has become more publicised in the press, it still remains just one of many problems that schools have to deal with. The level of priority and the importance that each school places on the condition may vary. This in turn may affect the access of staff to information, their level of knowledge, and preparedness to deal with an emergency. Children are most likely to be vulnerable around break and lunch times, yet less than half the schools with an allergic child had given information to staff supervising this period. It is important that staff are aware of affected children and know what action to take.

Attitudes and policies varied between schools. A minority did not allow nuts in school. A small number served only "nut free dinners".

Our survey shows a wide variation in the medication available in school for affected pupils. This may reflect the differing prescribing habits of GPs and paediatricians. Notably 56 (64%) pupils known to be nut allergic had no medication in school. EpiPen was the most commonly available medication for those who had medication in school. Antihistamines were not commonly available but have an important role in the management of acute allergic reactions, and are able to eliminate the local or general inflammatory response.⁶ It is our view that antihistamines should be more widely available for affected children and that asthmatics should also have bronchodilator inhalers.

A common problem in schools is finding a safe place to store medication where it will be readily available. Our survey shows that the school office is often used, but there is wide variation. Places for safe storage have to be decided for individual schools and pupils to make it easier for all staff to find essential medication in an emergency. The safety of staff and pupils must be considered at all times; particular attention must be paid to safe storage, handling, and disposal of medicines. Training for staff should include guidance in safety procedures.⁷

There was uncertainty concerning insurance cover for staff administering the medications in school. Information regarding insurance may reduce anxiety and increase willingness among staff to become involved and give life saving medication when needed. In Gloucestershire the local education authority insures staff to give medication such as EpiPen and Piriton in school, provided they have appropriate protocols and training.

Our survey also showed a lack of knowledge in schools concerning signs and symptoms to look for in children suffering a nut allergic reaction in school. Schools without an affected child were significantly less knowledgeable. In some cases

there is confusion about which signs are mild or severe. Some signs such as abdominal pain and diarrhoea were not mentioned at all. We have included this information in our booklet for schools. We propose to give information to all schools, including those without a known affected child because allergy in some children may be as yet unidentified. This point will also be emphasised to the schools.

The role of all community child health departments should be to inform schools adequately about nut allergy in schoolchildren and its management, and to increase confidence among staff in dealing with emergencies. From our findings we would recommend that all schools should receive information including:

- (1) How to prevent exposure
- (2) Recognition of mild and severe signs
- (3) Understanding the severity of symptoms
- (4) Dealing with an acute allergic reaction.

We have summarised the mild and severe reactions stated in our information leaflet as follows:

- Mild: itchy/tingling mouth or metallic taste, rash and itching (either local or general), flushed face/neck or generalised, abdominal pain/diarrhoea/vomiting, anxiety and tiredness.
- Severe: swelling face/neck/throat, hoarse voice/cough, swallowing difficulty, breathing difficulty caused by wheezing or throat swelling/stridor, feeling faint, rapid weak pulse, blue colour to lips, collapse, loss of consciousness.

In order to provide information in a clearer and more readily available format to be referred to in an emergency, we have also prepared an action plan in the form of a flow chart (see fig 1). An alternative plan is detailed in fig 2. Our study will be repeated 12 months after dissemination of revised information to schools in order to assess the effectiveness of the new strategy.

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The questionnaire can be viewed on the ADC website (www.archdischild.com)