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Research Protocol

Survey of Awareness about Anaphylaxis and its Emergency Management amongst Medical Professionals and Supporting Staff

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Abstract

Although Anaphylaxis is a well-recognized life threatening medical condition, yet it seems the awareness about its causative agent, diagnosis and its immediate treatment is lacking amongst medical professionals and supporting staff in medical setup. The aim of the present survey is to evaluate the existing knowledge about diagnosis of anaphylaxis and its emergency treatment in medical healthcare professionals and eventually spread awareness about it.

Keywords: *Allergy; Anaphylaxis; Adrenaline; Intramuscular; Health Care Plan; Emergency Management*

Introduction

Anaphylaxis is a serious allergic response that often involves swelling, hives, lowered blood pressure and in severe cases, shock. If anaphylactic shock isn't treated immediately, it can be fatal. A major difference between anaphylaxis and other allergic reactions is that anaphylaxis typically involves more than one system of the body.

Symptoms usually start within 5 to 30 minutes of coming into contact with an allergen to which an individual is allergic. In some cases, however, it may take more than an hour to notice anaphylactic symptoms. Warning signs may include:

- Red rash (usually itchy and may have welts/hives)
- Swollen throat or swollen areas of the body
- Wheezing
- Passing out
- Chest tightness
- Trouble breathing
- Hoarse voice
- Trouble swallowing
- Vomiting

- Diarrhea
- Stomach cramping
- Pale or red color to the face and body.

The relative importance of specific anaphylaxis triggers in different age groups appears to be universal. Foods are the most common trigger in children, teens and young adults. Insect stings and medications are relatively common triggers in middle-aged and elderly adults; in these age groups, idiopathic anaphylaxis, a diagnosis of exclusion, is also relatively common. The mechanism involves the release of mediators from certain types of white blood cells triggered by either IgE or non IgE mediated mechanisms. Diagnosis is based on the presenting symptoms and signs after exposure to a potential allergen.

The primary treatment of anaphylaxis is epinephrine injection into a muscle and positioning the person flat. Additional doses of epinephrine may be required. Other measures, such as antihistamines and steroids, are supportive.

Carrying an epinephrine auto injector and identification regarding the condition is recommended in people with a history of anaphylaxis. An epinephrine auto injector (or adrenaline auto injector, commonly known as an EpiPen, other brands are also available) is a medical device for injecting a measured dose or doses of epinephrine (adrenaline) by means of auto injector technology. It is most often used for the treatment of anaphylaxis. The first epinephrine auto injector was brought to market in 1983.

When anaphylaxis is suspected, epinephrine solution should be given as soon as possible as an intramuscular injection, in the middle of the outer side of the thigh, which corresponds to the location of the vastus lateralis muscle. The injection may be repeated every 5 to 15 minutes if there is insufficient response.

EpiPen (0.3 mg) is used for patients who weigh 66 pounds (30 kg) or more and EpiPen Jr (0.15 mg) is for patients who weigh approximately 33 to 66 pounds (15 - 30 kg). The intramuscular route is preferred over subcutaneous administration because the latter may have delayed absorption.

In a study conducted by Yichao Wang., *et al*. was found that worldwide anaphylaxis affected 1 - 761 children out of 100,000 worldwide.

Another study conducted by Lee., *et al*. concluded that the incidence of anaphylaxis increased from 2001 to 2010 and food-related anaphylaxis in children, venom and medication-related anaphylaxis in young to middle adults were common. In conclusion, Anaphylaxis is known to turn fatal in a matter of minutes and having auto injector and knowledge to use can save lives literally. Awareness about auto injector device cannot be overestimated amongst medical personnel and general public should also learn about it either through medical professionals or verified medical sources [1-17].

Result of Study

Survey of 85 medical personnel showed that most of them were aware that anaphylaxis is a life threatening condition. Majority, 93% were able to identify the anaphylaxis is a type of allergic reaction and almost same percentage of candidates (96.5%) were able to identify that anaphylaxis can be life threatening. Only 29.8% were correct while identifying all the modes of exposure to allergens whereas most of them (66.7%) were able to pick few of the reasons which can lead to anaphylaxis.

When provided with clinical scenarios almost half (46.3%) were right in diagnosing all the conditions as an anaphylaxis and another half (56.1%) were able to pick them partially. It was in contrast when the clinical condition was provided with statement including blood pressure, 80.2% were able to identify condition correctly as anaphylaxis. When asked about allergens almost all (91.2%) were not able to pick all the allergens from the given list and only 5.2% were able to identify, correctly, all the allergens from the list and 2% were not able to identify any allergen from the list.

All the participants were sure that they have heard about epinephrine and a high percentage (82.4%) of candidates were able to pick the correct emergency treatment as epinephrine as the best treatment and almost same percentage (84.2%) were able to identify EpiPen can be used for the treatment even though most of them (91.2%) had heard about EpiPen.

It was interesting to see that most of them knew about EpiPen but only 45.6% were right about the route of administration of drug using EpiPen and only 59.6% were right about the site of use for EpiPen. When asked about contraindication for the use of EpiPen (epinephrine) more than half were not aware about it. Almost 25% were either not knowing or were wrong about the recommendation to keep the EpiPen with the person/children who has history of anaphylaxis. Doctors were better by the average 15% in diagnosing and identifying the correct allergens and treatment of anaphylaxis. The entire result of survey can be found here.

Allergy/ anaphylaxis Survey Questionnaire

Serial no.	Question	%Correct	%Partial correct	%Wrong	%Don't know	%No	%Yes
1	What is anaphylaxis?	93	0	3.5	3.5		
2	Is anaphylaxis life threatening?	96.5	0	3.5	0		
3	How can anaphylaxis happen?	29.8	66.7	3.5	0		
4	Which one of these would you say is anaphylaxis?	40.3	56.1	3.5	0		
5	Which of these can cause anaphylaxis?	5.2	91.2	0	3.5		
6	Which is the best diagnosis for this case? 2nd grade male child immediately after enjoying a cake in school break feels dizzy and light headed, making noise while breathing. School nurse says she can't measure/feel the blood pressure.	80.7	0	1.8	17.5		
7	What is the best treatment?	82.4	0	17.5	0		
8	How can the treatment be given?	84.2	0	10.5	5.3		
9	Have you ever encountered a patient with anaphylaxis in any way –seen being treated or treated by you or you were a part of the treating team?					21	79
10	Have you heard about epinephrine /adrenaline?					0	100
11	Have you heard about EpiPen?					8.8	91.2
12	How is the EpiPen used?	45.6	0	47.4	7		
13	What does EpiPen contain?	96.4	0	1.8	1.8		
14	What is the contraindication of use of epinephrine?	38.6	0	57.9	3.5		
15	Once you have used epinephrine and waiting for ambulance to arrive what you should do in between?	66.7	0	24.5	8.8		
16	What is the best way to prevent future chances of anaphylaxis?	77.2	0	21	1.8		
17	Is it recommended to keep EpiPen for a person/child who is known to have anaphylaxis in past?	75.4	0	14	10.5		
18	On which site EpiPen should be used?	59.6	0	31.6	8.8		

Figure 1

Survey about knowledge of anaphylaxis and emergency management among health care providers

Place

Department

Designation

Kindly answer the questions to best of your knowledge. You have to tick the right answer(s). Do not rewrite or change your answer. More than one answers can be correct. This is just a survey.

1. **What is anaphylaxis?**
   - A. Did not hear about it
   - B. Fast progressing disease
   - C. A type of allergy
   - D. Have heard about it but do not know

2. **Is anaphylaxis life threatening?**
   - A. No
   - B. Yes
   - C. Do not know

3. **How anaphylaxis can happen?**
   - A. Because of viral infection
   - B. Because of food
   - C. Because of bacterial infection
   - D. Because of inhaling something while breathing
   - E. No idea
   - F. Because of fever
   - G. Because of medicine

4. **Which one of these would you say is anaphylaxis?**
   - A. 5yr Child with fever, cough and cold for 3 days ,suddenly develops rashes all over body on 4thday
   - B. A 1 yr. old child with hives, red geographical pattern with severe itching and waxing and waning over few days
   - C. 3 YR old girl immediately coming from a party after having peanut butter cake and cold drink with fast breathing and looking lethargic
   - D. 6 yr. old child with swelling on face and swollen tongue, ears with difficulty in speech andbreathing after enjoying a sea food party

5. **Which of these can cause anaphylaxis?**
   - A. Ampicillin
   - B. Peanut
   - C. Sea food
   - D. Sesame
   - E. Milk
   - F. Egg

6. **2nd grade male child immediately after enjoying a cake in school break feels dizzy and light headed , making noise while breathing . School nurse says she can't measure/feel blood pressure. What is the diagnosis?**
   - A. Allergy
   - B. Anaphylaxis
   - C. Severe asthma
   - D. Food stuck in food esophagus

7. **What is best treatment?**
   - A. Nebulize with salbutamol
   - B. Oxygen
   - C. Diphenhydramine
   - D. Epinephrine

E. Roll on to one side
F. Wait for the pediatrician to come

8. **How the treatment can be given?**
A. Nebulizer machine
B. Use EpiPen
C. Inhalation by inhaler
D. Oxygen mask
E. Don't know

9. **Have you ever encountered a patient with anaphylaxis in any way- seen being treated or treated by you or you were the part of the treating team?**
A. Yes
B. No

10. **Have you heard about epinephrine/ adrenaline?**
A. Yes
B. No

11. **Have you heard about EpiPen?**
A. Yes
B. No

12. **How EpiPen is used?**
A. Subcutaneous
B. Intramuscular
C. Intra venous
D. Intradermal
E. Inhalation
F. No idea

13. **What does EpiPen contain?**
A. Noradrenalin
B. Epinephrine
C. Dopamine
D. Dobutamine
E. Albuterol

14. **What is the contraindication for use of epinephrine?**
A. Congenital heart disease
B. Arrhythmia
C. No past history of anaphylaxis
D. There is no contraindication for the use of epinephrine in anaphylaxis

15. **Once you have used epinephrine and waiting for ambulance to arrive what you should do in between?**
A. Give water to drink
B. Let the child walk so that he does not become unconscious
C. Keep talking to him to keep him awake
D. Let him lay down and raise the legs
E. Give diphenhydramine if there is no skin symptoms

16. **What is the best way to prevent future chances of anaphylaxis?**
A. Make the schools nut free
B. Use individual care plan planned by physician along with school nurse
C. Proper use of hand sanitizer and/ or proper hand washing
D. Start regular exercise

17. **Is it recommended to keep an EpiPen for a person/ child who is known to have anaphylaxis in past?**
A. Yes
B. No
C. Don't know

18. **Which site EpiPen should be used?**
A. Left buttock
B. Deltoid
C. Anterolateral aspect of thigh
D. Right buttock
E. Subcutaneous anywhere

Figure 2

Conclusion

Data of study suggest that there is still a lack of awareness about the cause, diagnosis and immediate treatment of anaphylaxis. Even though doctors who have been a part of the treating team for anaphylaxis patient were lacking knowledge about the triggers of anaphylaxis and proper treatment and use of self-injectable adrenaline though their level of knowledge about diagnosis and treatment was very good however when we compared between nurses and doctors there was considerable difference in the level of knowledge; for nurses level of knowledge was moderate and can be improved.

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