

Level of knowledge about anaphylaxis and its management among health care providers

H. S. Drupad, H. Nagabushan

Abstract

Objectives: This study was conducted to assess the level of knowledge of health care providers regarding anaphylaxis and its management at a tertiary care teaching hospital. **Materials and Methods:** A pretested structured questionnaire was administered to interns, MBBS Phase II students, and nursing students. The subjects were asked to answer the questionnaire, which included questions regarding anaphylaxis and its management. **Results:** Of 265 subjects, 151 (56.9%) of subjects answered correctly that adrenaline is the first line of drug for the treatment of anaphylaxis. Among 151 subjects, 40 (26.4%) answered the correct dose of adrenaline, of which 25 (16.5%) subjects selected intramuscular injection as the most appropriate route of administration. Medical students' performance was better than interns and nursing students on questions regarding dose, route, and site of adrenaline administration. **Conclusion:** Knowledge regarding the management of anaphylaxis was inadequate in almost all the health care providers who were included in the study. Improved education and training of health care providers are necessary for better management of anaphylaxis.

Keywords: Adrenaline, health care professionals, questionnaire

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Introduction

Anaphylaxis is a life-threatening acute generalized systemic reaction.^[1] Mast cells are the key effector cell of the biological response to anaphylaxis with the release of various mediators of inflammation.^[2] The frequency of anaphylaxis is approximately 50–2000 episodes/100,000 persons and has a lifetime prevalence of 0.05–2.0%.^[3] Recent studies have shown that there is an increase in incidence and prevalence of anaphylaxis over the last 20 years.^[4]

Adrenaline is the life saving and first line of drug to be used for the treatment of anaphylaxis.^[5] Several studies conducted previously reveals that there is a lack of knowledge regarding dose and route of administration of adrenaline and confusion in selecting the first line drug

for treating the emergency condition among health care professionals.^[6-8]

The aims and objectives of this study were to assess the knowledge of interns, medical students, and nursing students regarding anaphylaxis and to ascertain the knowledge regarding dose, route of administration, and concentration of the drug(s) used for its management.

Materials and Methods

This cross-sectional study was conducted in a tertiary

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From:

Department of Pharmacology, Mandya Institute of Medical Sciences, Mandya, Karnataka, India

Correspondence:

Dr. H. S. Drupad, No. 19, 2nd Cross, 2nd Main, 2nd Block, Nandhini Layout, Bengaluru - 560 096, Karnataka, India.
E-mail: dhrupe@gmail.com

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care teaching hospital after obtaining permission from the Institutional Ethical Committee. Health care providers (interns, final year nursing students and MBBS Phase-II) were included in the study. A questionnaire was developed comprised of ten questions, regarding knowledge about anaphylaxis and the drugs used in its management (Appendix 1).

Knowledge regarding anaphylaxis was ascertained based on the number of questions each participant answered correctly. The response to the individual questions for the subjects in each group was analyzed separately. The data were presented both as numbers and percentages.

Descriptive statistics was analyzed using Epi-data analysis version V2.2.2.178 software (Epidata association from Denmark). The results were analyzed using the Chi-square test, and $P < 0.05$ was considered as statistically significant.

Results

A total of 265 subjects participated in this study, of which 99 were 2nd year medical students, 101 medical interns, and 65 were nursing students.

Of 265 subjects, 175 answered correctly the first question (#1) regarding to which type of hypersensitivity reaction anaphylaxis belongs. One hundred and fifty-one (56.9%) subjects answered correctly the second question (#2), indicating that they would select adrenaline as the first line of drug for anaphylaxis. Among 151 subjects 40 (26.4%) answered the correct dose of adrenaline of which 25 (16.5%) of subjects selected that the preferred method of administration was intramuscular injection [Figure 1], 14 (9.2%) selected subcutaneous injection, only eight (5.2%) selected intravenous injection.

The response to the first two questions (#1, 2) was almost similar (65%, 69%) among interns and MBBS-II

students, respectively, when compared to the nursing students (37%). For the next three questions (#3, 4, 5) regarding the dose, route and site of administration, medical students had better knowledge (27%, 47%, and 40%) than interns (16%, 19%, and 17%) and nursing students (11%, 18%, and 6%) respectively. The responses to the questions (#6, 7, 8) related to the concentration of adrenaline for the intravenous, intramuscular and subcutaneous route, were answered incorrectly by all three groups [Figure 2].

There was a statistical significant difference between medical students, interns and nursing students in response to questions (#2, 4, 5) related to the first drug of choice, the route, and the site of administration of drug ($P < 0.001$) for the treatment of anaphylaxis, showing that medical students had more knowledge in these areas [Table 1].

Discussion

Anaphylaxis, an acute life-threatening emergency condition, requires immediate treatment in order to prevent further progression and to prevent complications.

The main purpose of this study was to assess the existing knowledge of interns, nursing students, and MBBS Phase II students regarding anaphylaxis and its medical management.

It was observed that none of the subjects answered all the questions correctly. When the response to the individual questions were analyzed, 65.6% of subjects answered correctly to the question related to anaphylaxis (i.e., question numbers 1 and 2) and the response rate was poor in areas related to the medical management of anaphylaxis.

Previous studies have shown that 90.1% of medical professionals prefer adrenaline as the first line drug, with 38.3% preferring intramuscular route and 51.7% preferring intravenous adrenaline.^[9] Our study has

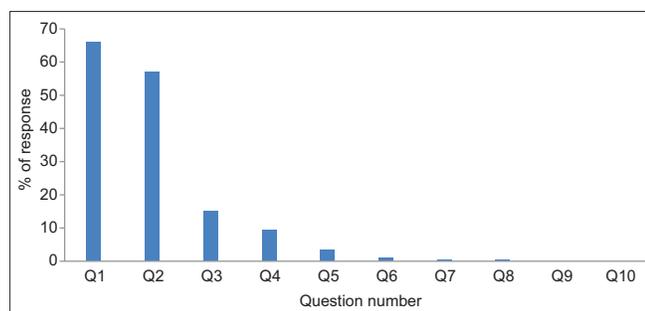


Figure 1: Total percentage of correct response for each question

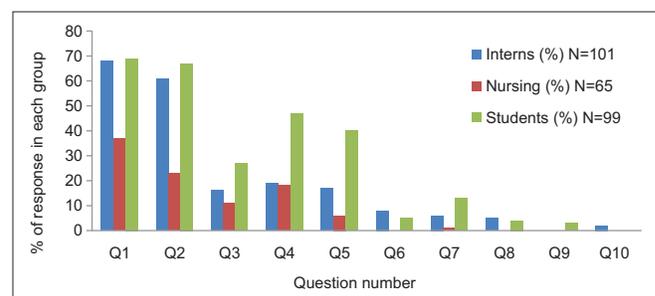


Figure 2: Percentage of correct response in each group

Table 1: Response distribution to questions between three groups

Questions	Interns (%) (n=101)	Nursing (%) (n=65)	Students (%) (n=99)	Total (n=265)	Chi-square (P)
Q1					
Correct	68	37	69	174	3.041 (0.219)
Not correct	33	28	30	91	
Q2					
Correct	61	23	67	151	17.468 (<0.001)
Not correct	40	42	32	114	
Q3					
Correct	16	11	27	54	4.660 (0.097)
Not correct	85	54	72	211	
Q4					
Correct	19	18	47	84	19.610 (<0.001)
Not correct	82	47	52	181	
Q5					
Correct	17	06	40	63	25.381 (<0.001)
Not correct	84	59	59	202	
Q6					
Correct	08	0	05	13	5.326 (0.070)
Not correct	93	65	94	252	
Q7					
Correct	06	01	13	20	8.161 (0.017)
Not correct	95	64	86	245	
Q8					
Correct	05	0	04	09	3.154 (0.207)
Not correct	96	65	95	256	
Q9					
Correct	0	0	3	3	5.088 (0.079)
Not correct	101	65	96	262	
Q10					
Correct	02	0	0	02	3.272 (0.195)
Not correct	99	65	99	263	

shown that the majority of subjects (56.9%) preferred adrenaline as the first line drug for the treatment of anaphylaxis. Of 151 subjects, 16.5% preferred intramuscular injection as the most appropriate route of administration. This shows that the level of knowledge in our study was lower when compared to previous study.^[9]

Among the study subjects, medical students had better knowledge of anaphylaxis as regards the type of hypersensitivity reaction and as to which drug is used for first line treatment. Another study has shown that 80 (73.3%) of participants correctly opted to use adrenaline as first-line treatment for anaphylaxis.^[10] In that study, 84.6% were 2nd year students and 74.2% interns. In comparison, our study revealed that 67 (67.6%) medical students, 61 (60.3%) of interns and 23 (35.3%) of nursing students chose adrenaline ($P < 0.001$).

In one prior study, the reason for not choosing adrenaline as first line drug by junior doctors was probably due to their concern with its potential adverse effect.^[11]

Another study comparing two district hospitals has shown that there was a lack of knowledge in a significant

number of senior and junior doctors regarding the dose, route, and concentration of adrenaline.^[12] Our study also showed similar results.

In our study, of the 151 subjects who had answered adrenaline as the first line drug, only 40 knew the correct dose of adrenaline, out of which 25 subjects selected intramuscular injection as the preferred route of administration.

The standard pediatric dose is 0.01 mg/kg, but the majority of the participants were unable to answer the correct dose. There was a lack of knowledge about the pediatric dose, the route and the concentration of adrenaline.

The main limitation of our study was that it was a single-centered study with a small sample size and included only interns, medical, and nursing students.

There is a need for the development of interventional strategies to fill the knowledge gap for the ideal anaphylaxis management.

Conclusion

Knowledge regarding anaphylaxis and its management is a basic requirement that every health care providers must acquire for the appropriate treatment of all patients. In our study, there was a lack of knowledge regarding the medical management of anaphylaxis in interns, MBBS Phase II students, and nursing students. Proper initial training and periodic review and reinforcement of the steps in the treatment of anaphylaxis is necessary for all health care providers to achieve better patient care.

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Conflicts of interest

There are no conflicts of interest.

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Appendix 1

Anaphylaxis and its management

Questionnaire

- What type of hypersensitivity reaction is Anaphylaxis?
- What is the first line of drug for anaphylaxis?
- What is the dose of the drug?
- What is the most preferred route used to administer the drug?
- What is the most common site?
- What is the concentration of drug for IV route?
- What is the concentration of drug for IM route?
- What is the concentration of drug for SC route?
- What is the paediatric dose of the drug?
- What is the concentration of the drug available in our hospital?