

Anaphylaxis and Acute Asthma in California Schools

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INTRODUCTION

There is little available data regarding the morbidity and mortality of acute asthma and anaphylaxis in California schools. In 2002 California State Law was enacted to allow school districts to voluntarily establish policies for treating acute anaphylaxis in schools and to stock each school with injectable epinephrine.¹ This was to be accompanied by annual training of the staff. It is unclear as to the extent to which these policies have voluntarily been implemented throughout the state of California. In addition the California Department of Health Services (DHS) has recommended that schools keep extra quick relief inhalers for those children who lose or forget their inhalers.² Again it is unclear whether this recommendation is being followed.

Fatalities from asthma in children are rare. Nonetheless they occur at rate of one per 2.1 million annually in California, more than twice the Healthy People 2010 goal.³

In fatal reactions, the average time from ingestion to cardiac or respiratory arrest is 8 minutes in venom anaphylaxis and 30 minutes in food anaphylaxis.⁴ It is noted that school might present a special hazard to children with food allergy.⁵ Prompt administration of epinephrine is critical in preventing fatalities.⁶ However, it is unclear whether children have access to epinephrine at school during anaphylactic reactions.

The purpose of this study was to survey the school nurses in California to assess the frequency of life threatening episodes of anaphylaxis and asthma and to assess the readiness of the schools to deal with these episodes.

METHODS

A 56 question on-line survey was developed to examine school nurses experiences in California relating to emergencies from acute asthma and anaphylaxis. The questions explored the frequency of these episodes, as well as the availability of self-injectable epinephrine and short-acting bronchodilators at school. In addition we solicited the degree of support for the availability of stock medications and protocols for addressing emergencies at school from acute asthma and anaphylaxis. We also asked about the awareness of any fatalities at school from asthma or allergic reactions.

The survey was introduced at an exhibit of the annual meeting of the California School Nurses Organization (CSNO) in Los Gatos, California. It was also sent by e-mail to approximately 1150 members of the CSNO.

RESULTS

- 171 surveys were returned and then analyzed. Responses came from credentialed school nurses representing 52 of the 988 school districts in California.
- 53% of respondents indicated they represented schools from a single district, San Diego Unified (SDUSD)

OCCURRENCE OF LIFE-THREATENING EPISODES OF ASTHMA & ANAPHYLAXIS

Personally witnessed anaphylaxis	38%
Personally witnessed life threatening asthma	57%
EMS called in last two years for Asthma or anaphylaxis	52%
EMS called 3 or more times in 2years	20%
EMS response time over 10 min	11%

RESULTS (Continued)

USE OF MEDICATIONS IN ACUTE ASTHMA & ANAPHYLAXIS

Does your school have written policies or guidelines for staff to follow for students with severe food allergies?	79%
Do you have annual training of the use of epinephrine?	79%
Have used epi in the past two years at school?	21%
Have had to use another child's bronchodilator in an emergency?	26.3%
Have had to use another child's epinephrine in an emergency?	8.2%

FATALITIES

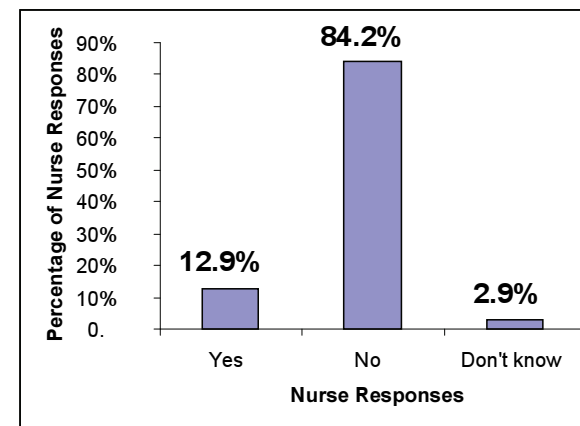
Have you had any fatalities at school from asthma?	0.2% (n=3)
From anaphylaxis?	0.1% (n=1)

AVAILABILITY/ACCESSIBILITY OF EPINEPHRINE

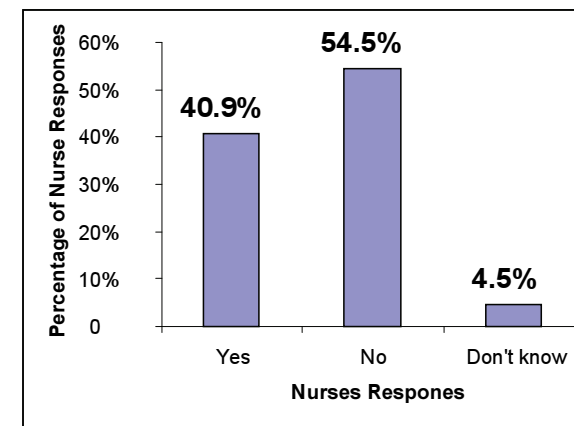
Are aware of children with hx of anaphylaxis	97.6%
Are aware of children with hx of anaphylaxis WITH NO EPINEPHRINE at school	72.5%
Store epinephrine at school for children	90.1%
Keep epinephrine locked	81.8%

What About Stock/General Use Epinephrine?

Do your schools have a program for placing stock epi auto-injectors in all schools for allergic emergencies?



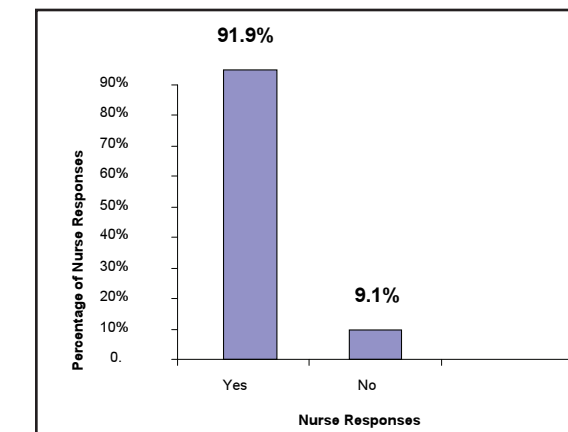
Has the stock epinephrine ever been used?



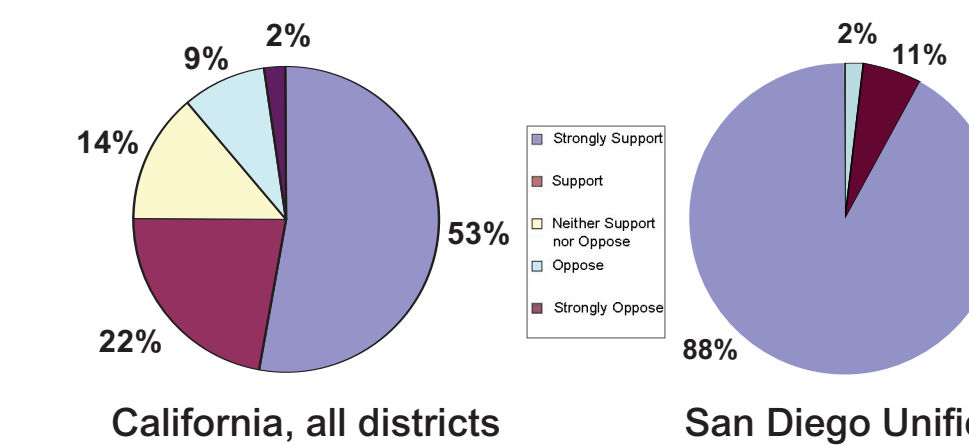
57% of use was in PREVIOUSLY UNIDENTIFIED students

Stock Bronchodilators

"Has it been used in the last two years?"

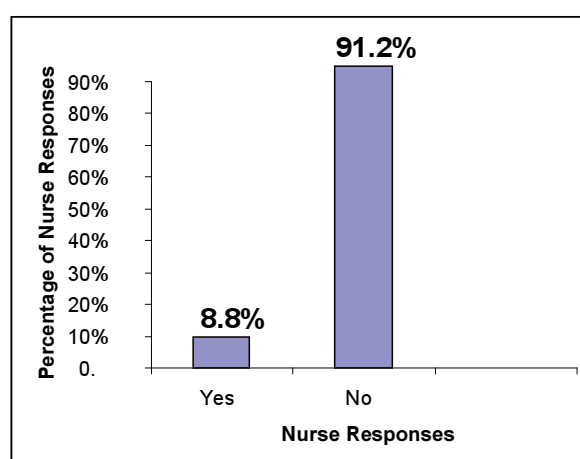


Do School Nurses Support Putting Stock Epinephrine in

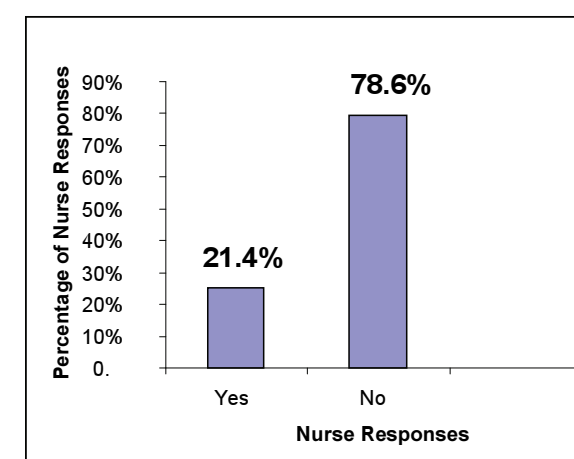


What About Stock/General Use Albuterol?

"Stock bronchodilator on site, not necessarily for a specific individual's use"

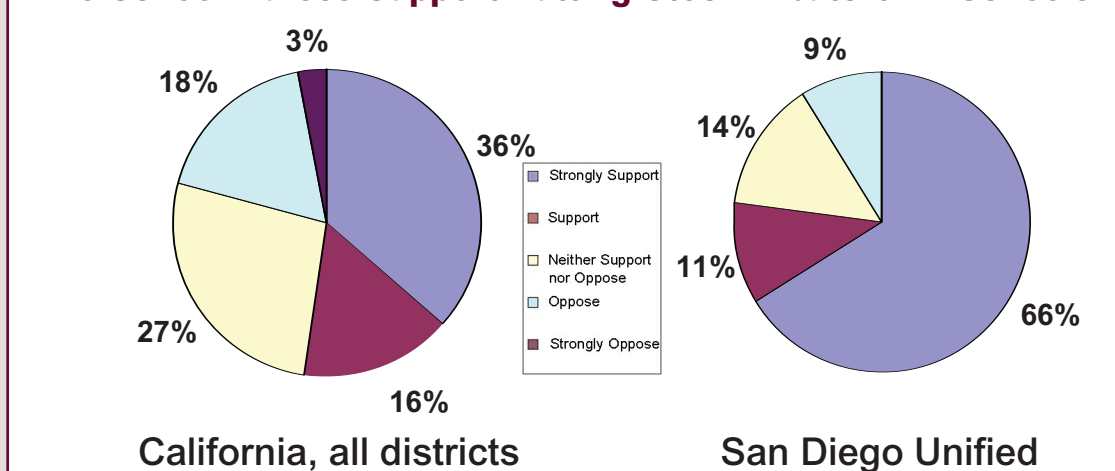


California, all districts



San Diego Unified

Do School Nurses Support Putting Stock Albuterol in Schools?



DISCUSSION

CSNO represents approximately 50% of the roughly 2800 school nurses in California. The 171 responses in our study represent 12% of the CSNO membership. Thus, this survey reflects the experience of a small proportion of California school nurses, but nonetheless brings to light areas of concern.

It is alarming that 73% respondents are aware of children with a history of severe allergic reactions and who have no epinephrine at school. It appears that not infrequently, another children's epinephrine auto-injector is being used in an emergency. While it is reassuring that school staff will cross this line, it is also likely that there is no action plan or protocol in this scenario. Despite its good intent, permissive legislation in California that allows school districts to develop local policy and supply stock epinephrine to each school has failed to be adopted on a statewide level.

25% of children who experience anaphylaxis will have first episode in school.⁷ Stock epinephrine in school can be potentially life saving. We found that stock epinephrine was used most commonly in students with no prior history of anaphylaxis.

Over half the nurses surveyed indicated that EMS had been activated for life threatening asthma or anaphylaxis at least once within the last two years at their school. With 9650 public schools in California⁸, this clearly represents thousands of ambulance calls each year. In addition, the fact that 10% of nurses stating that EMS response time is greater than ten minutes magnifies the need for available medications in those schools.

CONCLUSIONS

- Life-threatening asthma and anaphylaxis occur frequently in California schools, in children with and without a prior diagnosis.
- Often the medications used to treat these reactions are not readily available.
- Not infrequently, children were being treated with other children's medications during emergencies in school, and without protocol or trained personnel.
- Despite recent permissive legislation in California to allow school districts to develop policies and have stock epinephrine in schools, this is not being done on a widespread basis.
- The availability of stock epinephrine and albuterol available in public schools is generally supported by California school nurses.
- Current nursing ratios of 1:2800 in California (as compared to national recommended standard of 1:750) are grossly inadequate to deal with these school emergencies.

REFERENCES

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