

## Parental Awareness Regarding Aerodigestive Pediatric Foreign Bodies. Eastern Province, Saudi Arabia

Fatimah A. AlShakhs<sup>1</sup>, Khalid A. AlYahya<sup>2</sup>, Asmaa S. AlSaeed<sup>1</sup>, Marwah S. AlSultan<sup>1</sup>  
Faculty of medicine, King Faisal University, Al-Sharqiya, Saudi Arabia<sup>1</sup>, Otolaryngology Head and Neck Surgery. King Faisal University Ahassa, Saudi Arabia

### ABSTRACT

**Background:** Aerodigestive foreign bodies are common clinical problem that may lead to life threatening complications or sudden death. It's commonly seen in children since they are curious to explore environmental objects with their mouth, while the development of airway protection reflexes and chewing capacity are immature.

**Objectives:** This study aims to assess the extent of parents' awareness about the danger of foreign objects that can be swallowed or inhaled by their children and how to manage such cases.

**Materials and Methods:** A cross sectional study was used to assess the level of parents' awareness about the danger of swallowing or inhaling foreign objects by their children and to assess their knowledge about dealings with such cases. The data were collected from 459 by a distributed questionnaire among parents in Al-sharqiya.

**Results:** 60.3% of participants were aware of aerodigestive foreign bodies. Regarding the management of child with aerodigestive foreign bodies in different age groups. For child with age group 1 year and less, about (34.9%) of participants were aware of the management. However, there is misunderstanding of managing child with age 5 years and less where only 5.6% of participants were aware of the management in this age group. As regards the children more than 5 years old, only 36.2% of parents were aware of the management.

**Conclusion:** The current study showed that most parents are lacking knowledge about the management of this problem which reflect the importance of education and increasing the awareness among them to reduce the morbidity and mortality rate among children.

**Keywords:** Aerodigestive tract, foreign body, pediatric, Parental awareness, Saudi Arabia, Eastern province.

### INTRODUCTION

Aerodigestive foreign bodies are common clinical problem that may lead to life threatening complications or sudden death. The foreign body can be lodged either in airway tract or digestive tract. It's commonly seen in children since they are curious to explore environmental objects with their mouth in spite of insufficient airway protection reflexes, and immature development of chewing capacity<sup>[1]</sup>. The majority of those children are under age of five years old<sup>[2]</sup>. Early recognition of foreign bodies is essential to prevent serious problems such as atelectasis, pneumonia and bronchiectasis or even asphyxia and death<sup>[3]</sup>. The presentation varies depending on the location, size and type of foreign body. It may manifest as coughing, difficulty in breathing, vomiting, choking or fever<sup>[4]</sup>. Most of these foreign bodies are coins, batteries and small toys<sup>[5]</sup>. One of the fatal foreign objects is button battery that's commonly used for hearing aids, watches and some toys<sup>[6]</sup>. It's small, shiny and smooth object which attract most children who handle it. It contains materials that are strong enough to cause rapid liquefaction necrosis of tissue leading to serious complications such as perforation, mediastinitis, or

even death<sup>[7, 8]</sup>. Radiological investigations should be used to identify the object but

not to exclude it. Bronchoscopy also should be done as diagnostic, therapeutic tool or both<sup>[9]</sup>. Since pediatric aerodigestive foreign bodies are common worldwide; prevention is the best way to decrease the incidence, morbidity and mortality as well. The aim of this study is to assess the level of parents' awareness regarding swallowing or inhalation of foreign objects by their children and how to deal with such cases.

### MATERIALS AND METHODS

#### *Study design*

A cross sectional study was used to assess the level of parents' awareness of danger of swallowing or inhaling foreign objects by their children and to assess their knowledge about dealings with such cases.

#### *Study area and population*

The data were collected by a distributed questionnaire among parents in Al-sharqiya. The study included parents who have children under age of five years old. The sample size was calculated by Creative

Research Systems survey software with confidence level 95%.

**Questionnaire sheet**

A well-structured questionnaire was designed in Arabic including, parent of child, age of child, whether the parent has knowledge about the problem or not. Also, it included twelve questions about the awareness of the risks of aerodigestive foreign bodies. This questionnaire was distributed among participants preceded by brief explanation of the aim of the study.

**Data analysis**

The data were analyzed by using the Statistical Package for the Social Sciences, SPSS version 20. Also, the data were presented in the form of graphs

and tables with presence of percentages and frequencies.

**The study was done after approval of ethical board of King Faisal university.**

**RESULTS**

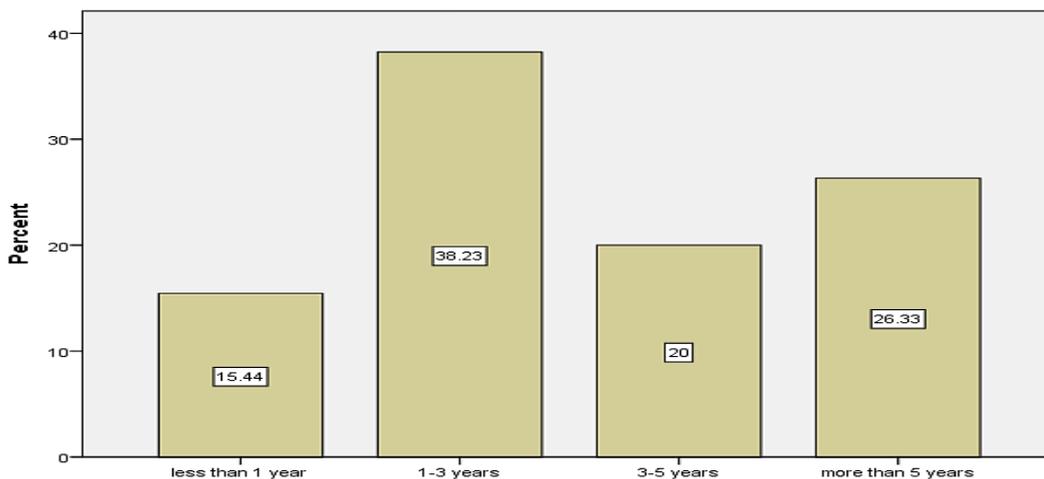
**General data**

In this study, 459 participants were involved. Sixty-four of them were excluded due to some deficiencies. The majority of participants (80.8%) were mothers while (19.2%) were fathers (table 1).

Child with age less than 1 year were only (15.4%), 38.2% with age 1-3 years, 20% with age 3-5 years, and 26.3% with age more than 5 years (figure 1).

**Table (1): child's parents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Father	76	19.2	19.2	19.2
Mother	319	80.8	80.8	100.0
Total	395	100.0	100.0	



**Figure (1): Ages of the children**

**Awareness of aerodigestive foreign bodies:**

The tables below represent the percentages and frequencies of the questionnaire results. 60.3% of participants were aware of aerodigestive foreign bodies (table 2). However, (88.6%) were aware of risks of disc battery which is a huge number (figure 2).

The table below showed the significant difference in managing the children with different age groups. For child with age **1 year and less**, (34.9%) of participants will do back blows and chest compression, (26.8%) will go to ER, and only small percentage (13.9%, 3.8%, 9.6%) will try to remove the foreign body, do gentle abdominal thrusts while supine and while standing, respectively. About 11%

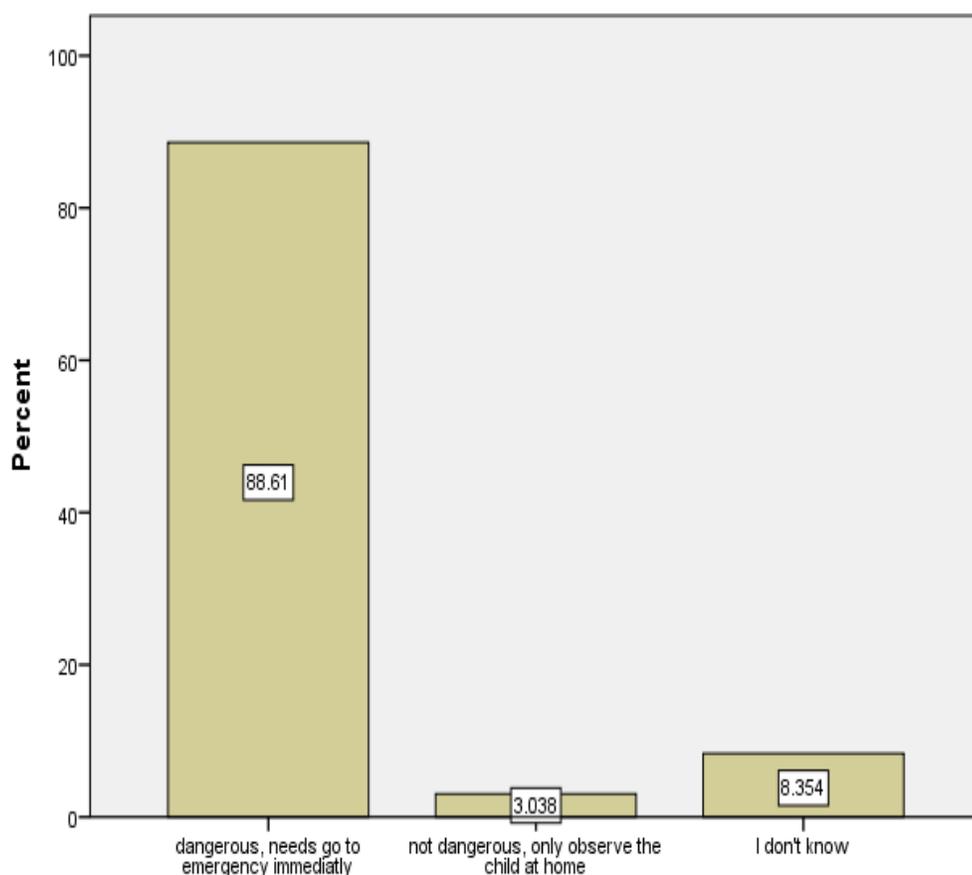
of the participants don't know how to interfere in such case (table 3). However, for **5 years and less**, (27.3%) chose the first option, (17.7%) will go to ER, (25.6%) will do abdominal thrusts while standing and only (15.2%, 5.6%) will try to remove the foreign body and do gentle abdominal thrusts while supine, respectively (table 4). About 17% chose the first option for child with age **more than 5 years**, and only 16.7% will go to ER or try to remove it. Small percentage (5.1%) will do gentle abdominal thrusts while supine and 36.2% will do abdominal thrusts while standing. However, only 8% don't know (table 5).The result of going to ER all the cases or when the symptoms developed were approximately equal (73%), 23.3% of participants think that they need to

go to ER depending on the type of foreign objects even without presence of symptoms, and other options were not significant (table 6). The last question used to evaluate the parent’s knowledge

regarding the management of child with total obstruction of airway. The results showed that (31.39%) will go to ER and 66.58% will start CPR (figure 3).

**Table (2):** awareness of aerodigestive foreign bodies (in general)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	238	60.3	60.3	60.3
	No	157	39.7	39.7	100
	Total	395	100	100	



**Figure (2):** Risks of disk batteries ingestion

**Table (3): 1 year and less**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	back blows & chest compression	138	34.9	34.9
	going to ER	106	26.8	61.8
	trying to remove it	55	13.9	75.7
	abdominal thrusts (supine)	15	3.8	79.5
	abdominal thrusts (standing)	38	9.6	89.1
	I don't know	43	10.9	100
	Total	395	100	100

**Table (4): 5 years and less**

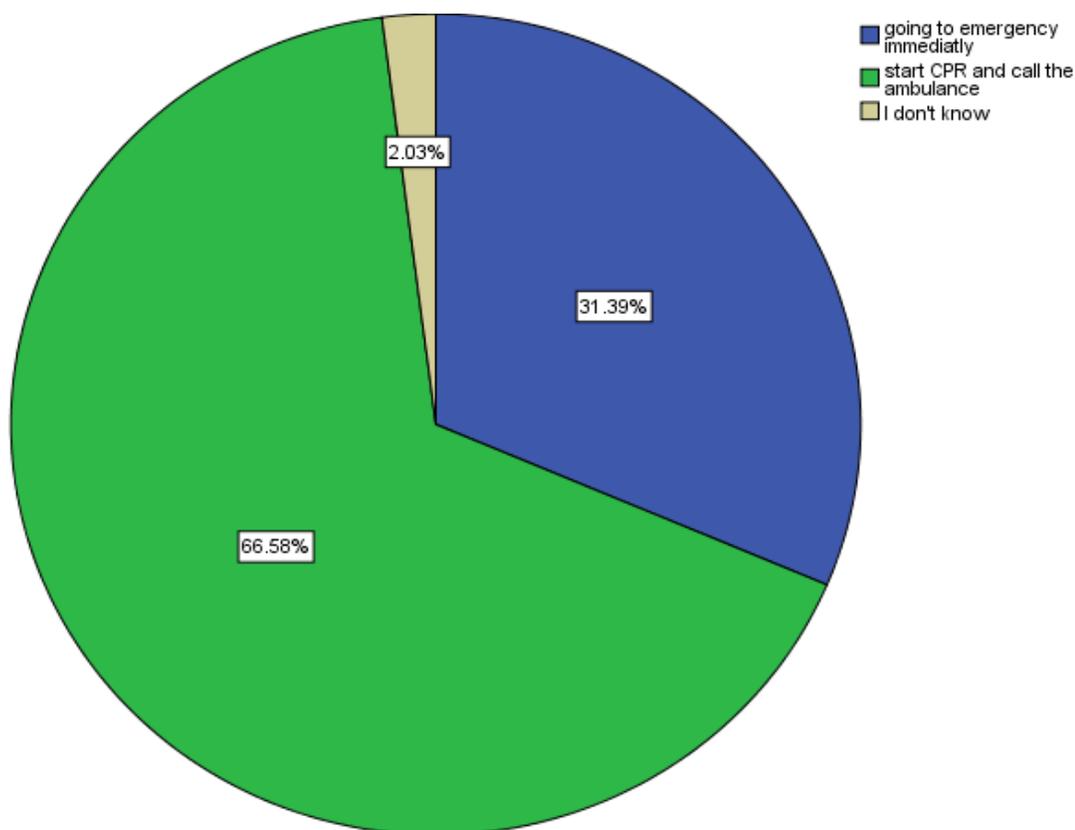
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	back blows & chest compression	108	27.3	27.3
	going to ER	70	17.7	45.1
	trying to remove it	60	15.2	60.3
	abdominal thrusts(supine)	22	5.6	65.8
	abdominal thrusts (standing)	101	25.6	91.4
	I don't know	34	8.6	100
	Total	395	100	100

**Table (5): more than 5 years**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	back blows& chest compression	67	17	17
	Going to ER	66	16.7	33.7
	trying to remove it	66	16.7	50.4
	abdominal thrusts (supine)	20	5.1	55.4
	abdominal thrusts (standing)	143	36.2	91.6
	I don't know	32	8.1	99.7
	Total	395	100	100

**Table (6): ER necessity**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No need to go	4	1	1
	When there are symptoms	149	37.7	38.7
	Depending on the type of foreign body even without presence of symptoms	92	23.3	62
	I don't know	3	0.8	62.8
	need to go for all cases	147	37.2	100
	Total	395	100	100



**Figure (3): Management of children with total airway obstruction**

## DISCUSSION

Foreign body aspiration/ingestion remains a huge problem which can lead to serious complications. In Thailand, they reported 4.7% mortality rate among younger children<sup>[10]</sup>. Moreover, USA reported that 2.5 million children suffered each year of FB ingestion or aspiration<sup>[11]</sup>. The majority of sufferers were under age of 5 years<sup>[4]</sup> which support this study. The hallmark of preventive measures is close supervision of pediatrics during playing<sup>[12]</sup>. In addition, education of parents about early detection and taking the proper steps regarding foreign body aspiration is well recommended because it has an impact of reduction of mortality rate as well as the risk of developing serious respiratory complications latterly<sup>[13]</sup>. Some researchers showed that education and training by using visual aids had a great impact on the participants' knowledge. Therefore, pediatric physicians should perform their consulting and

educator duty more actively by using dummy and visual aids to achieve the maximum benefits regarding first aid management of aerodigestive foreign bodies<sup>[14]</sup>.

In this study, more than half of parents have an idea about dangers of foreign bodies in aerodigestive tract. The vast majority of them are aware about the dangers of disc battery aspiration/ingestion and the critical need for urgent medical intervention in this case. Even though delivering the proper knowledge about the dangers of disc batteries to parents and caregivers is helpful, it is not enough to prevent this problem. Product manufacturers should be forced to redesign the battery component, too<sup>[15]</sup>. Regarding the management of child with aerodigestive foreign bodies in different age groups, the participants have lack of knowledge about the proper steps of management based on the age group. In the present study, children with age group 1 year and less, less

than half of participants will perform back blows and chest compression and around quarter of them will go to ER directly. In the age group of 5 years or less, a quarter of participants will do abdominal thrusts in standing position and only very minority of them which not exceed 6% will do abdominal thrusts in supine position. However, less than half of participants will do abdominal thrusts in standing position for children with age more than 5 years. The result of this study showed that there is misconception among the society about when to do abdominal thrust in standing and supine position. In addition, most of the participants (37.7%) think that going to ER is necessary only if the symptoms present which reflects the massive need for education about the dangers of some foreign bodies even in the absence of symptoms. They have to be well educated about the proper management for each age group and when it's necessary to go to ER in order to minimize the morbidity and mortality rate among children. A study made in India reported that 50.8% of the parents would try to remove the foreign body by themselves, 46% would take the child to a general physician (GP) while 3.2% of them were not sure what to do if their child aspirates <sup>[16]</sup>.

This current study clearly showed the necessity of going to ER or calls the ambulance if there is total airway obstruction. This is important on less than 1 year due to their small respiratory tract which increases the risk of life threatening consequences <sup>[17]</sup>. The severe consequences of aspiration were reported in a study made in Japan which occurred on seven cases (4.3%). In early diagnosis group, there were four cases of irreversible hypoxic brain damage and one death due to multiorgan failure while in delayed diagnosis group, one case of bronchiectasis and one of recurrent pneumonia <sup>[18]</sup>. However, the majority of participants in this study conclude that starting CPR is the proper way to manage this case. This study did not focus on the correct way of performing CPR that's why we don't know if these participants know how to do it in a correct way or not. A study showed that 45.2% of children the FB have been found despite normal physical examination and radiological findings but positive history. Therefore, the health practitioners must be aware about the fact that medical history is the key for the diagnosis of FBA <sup>[19]</sup>.

All individuals who are responsible for childcare, not only parents need to be well educated about the

risky situations of FBA for different age group in order to protect them. Additionally, they should be trained about the required measures that should be taken to minimize the risk of FBA. A study done showed the great effects of training on the pupils' level of knowledge <sup>[17]</sup>.

## CONCLUSIONS

Delayed recognition of aerodigestive foreign bodies and failure to establish the right management may lead to lethal consequences. The current study showed that most parents have lack of knowledge about the management of this problem which reflect the importance of education and increasing the awareness among them to reduce the morbidity and mortality rate among children. Training on first aid management of aerodigestive foreign objects had a massive reduction of morbidity and mortality rate. Therefore, proper education and training of parents and caregivers are recommended. Educational programs through pediatricians, social media and campaigns should be implanted to achieve this goal.

## ACKNOWLEDGMENT

The author and co-authors gratefully acknowledge Dr. Khalid AlYahya for his efforts in mentoring all through this research.

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