

# Level of Parental Awareness Regarding Aerodigestive Pediatric Foreign Bodies, Western Region, Saudi Arabia

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Received: September 2021; Accepted: September 2021; Published: October 1, 2021.

Citation: Nada Eidhah Algethami et al. Level of Parental Awareness Regarding Aerodigestive Pediatric Foreign Bodies, Western Region, Saudi Arabia. World Family Medicine. 2021; 19(10): 89-95 DOI: 10.5742/MEWFM.2021.94141

## Abstract

**Background:** Foreign body aspiration (FBA) is a life-threatening condition with a high mortality rate, especially in children less than three years of age. Delayed diagnosis is often due to the non-specific presentation of symptoms and the absence of a witness to the aspiration event.

**Aim:** This study aimed to assess parental knowledge and practices toward aerodigestive paediatric foreign bodies ingestion or inhalation, in Saudi Arabia.

**Materials and Methods:** A descriptive cross-sectional survey was conducted among Saudi parents in western region, Saudi Arabia during the period between 1st To 20th August. A pre-structured validated self-administered questionnaire containing 11 questions of awareness and 4 questions of practices toward aerodigestive pediatric foreign bodies, was distributed online via various Social Media platforms. The questionnaire was initiated after literature review for similar articles and after experts' consultation for validity and reliability.

**Results:** A total of 611 child caregivers completed the study questionnaire. Exactly 508 (83.1%) respondents were children's mothers and 103 (16.9%) were their fathers. Exactly 93.1% of the study parents heard of swallowing or inhaling foreign objects

and 77.3% reported that children aged 1-5 years are more likely to swallow or inhale foreign objects while 20.5% reported for children aged less than 1 year. About 69% of the parents buy children toys that contain small parts but to different degrees. As for protective actions, keeping small items out of children's reach was reported by 95.4% of the parents.

**Conclusion:** In conclusion, the study revealed that parental knowledge and practices toward FBA were on average (but not satisfactory) especially for the correct actions for swallowed objects and timely visits to ER even for asymptomatic ingested FB. On the other hand, safe practice, especially keeping small objects out of children's reach, was high, but observing young aged children while playing was unsatisfactory.

**Key words:** Children, foreign body aspiration, knowledge, parents, practices

## Introduction

By Jackson, the foreign body is described as a substance or items foreign to the place(1). Aero-digestive foreign bodies are one of the common clinical issues that can cause serious consequences or sudden death(2). Children who are under three years old are at a higher risk of FBA (3). This is due to many factors, including the lack of molar teeth, limiting their ability to effectively break foods like peanuts or melon seeds, narrow airways and immature defensive mechanisms (4)(5). FBA is the 4th leading cause of death in children less than three years old and the 3rd in infants less than one-year-old (6). Children have a tendency to put foreign objects in their mouths, such as coins which tend to be the most common problem worldwide and other objects such as buttons, marbles, crayons, toy pieces, and so on (1)(7). Button battery used for watches, hearing aids, and some toys is one of the life-threatening foreign bodies usually. In addition, the tiny, smooth, and bright appearance of the battery attracts most children who notice it. But, unfortunately, it includes strong enough materials to cause rapid liquefaction necrosis of tissue, leading to severe consequences such as mediastinitis, perforation, or even death (2).

About 90% of foreign bodies can move through the GIT easily without causing any harm; others cause trouble and show symptoms when they are stuck in the tonsils, the base of the tongue, crico-pharynx, or further down which may require intervention to avoid consequences (1)(3).

Cough, wheeze, and reduced breath sounds are the typical diagnostic triad found in about 40% of patients and recorded by several authors (5)(8). Also, when the foreign body is esophageal it can cause dysphagia, gagging, choking, drooling, and regurgitation (1). Because of the vague history, non-characteristic clinical features, radiological results, or parent-related concerns such as parent's lack of knowledge of clinical signs suggesting FBA, such as sudden choking and coughing, the diagnosis might be difficult or delayed (1)(9). Rigid bronchoscopy is considered the gold standard for locating and removing aspirated foreign bodies (4). Delayed diagnosis is associated with increased complications like atelectasis, pneumonia, bronchiectasis, asphyxia, and death (2). Foreign bodies are an important and preventable cause of mortality and morbidity in children and a cause of psychological distress for both the children as well as the parents (10). Improving the parent's awareness is one of the most helpful strategies to avoid FBA. To obtain this goal, it is essential to assess what parents think and how they react to FBA. That has led to reduce the risk of FBA and its complications (3). Unfortunately, no research in the western region discusses parental beliefs and actions regarding Aerodigestive Foreign Bodies. As a result, we are conducting this research to assess the beliefs and practices of Parents in this region to hopefully raise awareness.

## Methodology

A cross-sectional study was done to assess parental awareness regarding aerodigestive pediatric foreign bodies among Saudi parents from different cities of the Western region, Saudi Arabia, over the period from 1st to 20th August. A total sample size of 611 participants were involved from only Saudi parents who have children, who agreed to participate in the study, while participants other than the parents, non-Saudi parents and those who disagreed to participate were excluded.

### Data collection instrument:

We used a predesigned questionnaire. The 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. After the validation, the questionnaire was sent to the participants through various Social Media platforms (WhatsApp, Twitter, etc.).

### Ethical considerations:

Ethical approval was obtained from the research ethics committee of Taif University application NO: (43-007 ).

### Data analysis

After data were extracted, it was revised, coded, and fed into statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was statistically significant. For awareness items, each parent's answer was displayed for different situations. Descriptive analysis based on frequency and percent distribution was done for all variables including parents' personal data, children's age, awareness regarding aerodigestive paediatric foreign bodies, and parents practice to avoid child swallowing or inhaling of foreign bodies.

## Results

A total of 611 child caregivers completed the study questionnaire. Exactly 508 (83.1%) respondents were children's mothers and 103 (16.9%) were their fathers. As for educational level, 409 (66.9%) parents had university level of education or above while only 51 (8.3%) had a low level of education (below secondary). Exactly 115 (18.8%) parents had a child below 1 year while 132 (21.6%) had children aged 1-3 years and 275 (45%) had children aged above 5 years (Table 1).

Table 2 illustrates distribution of parental awareness regarding aerodigestive paediatric foreign bodies, Saudi Arabia. Exactly 93.1% of the study parents heard of swallowing or inhaling foreign objects and 77.3% reported that children aged 1-5 years are more likely to swallow or inhale foreign objects while 20.5% reported for children aged less than 1 year. As for subjects more inhaled or

ingested by children, 4.9% talked about coins, 4.3% for plastic games, 3.9% for nuts and 2.5% for batteries while 83.6% selected all of them. As for the correct action if child swallows a foreign object such as batteries, 91.8% reported for the child is in danger and I will take him to the emergency immediately but only 5.2% think that the child is not in danger and they will observe the child at home. Back blows and chest presses were the most reported behaviour for a child less than 1 year and exposed to swallowing or inhaling a foreign object (30.4%), followed by going to ER (28.6%), Abdominal compression (while lying down) (15.4%), while 14.9% will try to remove it and 2.9% don't know what to do. As for the correct behaviour for a child less than 5 years and exposed to swallowing or inhaling a foreign object, 28.2% selected going to ER, 27.8% will do back blows and chest presses, 14.2%v selected Abdominal compression (while standing) and a similar portion will try to remove it. Regarding the correct behaviour for a child more than 5 years and exposed to swallowing or inhaling a foreign object, going to ER was the most known among 27.3% parents, followed by Abdominal compression (while standing) (24.5%), and do back blows and chest presses (24.5%) while 11.1% will try to remove it. Exactly 52.2% of the parents said that they must go to the emergency in all cases when their

child has swallowed or inhaled a foreign object, but 32.7% will go to ER according to the type of foreign body even if there are no symptoms and 10.8% will go if there are symptoms. Regarding the correct action that parents will do if the child suffocates and his airway is completely blocked, 48.9% will do first aid (CPR), while 47% go to ER immediately and 4.1% don't know what to do. Exactly 32.9% of the parents agreed that not suffocating is a sure sign that the FB is disappearing while 15.2% agreed on delaying FB removal if the foreign body does not cause any symptoms.

Table 3 illustrates distribution of parental practice regarding aerodigestive paediatric foreign bodies swallowing, in Saudi Arabia. Exactly 69.2% of the parents buy children's toys that contain small parts but in different degrees (29.5% said sometimes). As for protective actions, keeping small items out of children's reach was reported by 95.4% of the parents (which was usually among 63.7%). Also, 43.3% of the parents reported that they never let their children under 5 years old eat alone without adult supervision, and only 28.8% never let their children under the age of 5 play on their own without adult supervision.

**Table 1. Personal data of study respondents, Western region, Saudi Arabia**

Personal data	No	%
<b>Respondent</b>		
Mother	508	83.1%
Father	103	16.9%
<b>Educational level</b>		
Below secondary	51	8.3%
Secondary	151	24.7%
University/ above	409	66.9%
<b>Youngest child age (years)</b>		
< 1	115	18.8%
1-3	132	21.6%
3-5	89	14.6%
> 5	275	45.0%

**Table 2. Distribution of parental awareness regarding aero-digestive paediatric foreign bodies, Western region, Saudi Arabia**

Awareness items		No	%
Have you ever heard of swallowing or inhaling foreign objects?	Yes	569	93.1%
	No	42	6.9%
At what age are children more likely to swallow or inhale foreign objects?	< 1	125	20.5%
	1-5	472	77.3%
	6-10	10	1.6%
	> 10	4	.7%
Which of the following items may be at risk of being inhaled or ingested by children?	None	5	.8%
	Coins	30	4.9%
	Plastic games	26	4.3%
	Nuts	24	3.9%
	Batteries	15	2.5%
	All of them	511	83.6%
If your child swallows a foreign object such as batteries, what is the correct action to do?	The child is in danger and I will take him to the emergency immediately	561	91.8%
	The child is not in danger and I will observe the child at home	32	5.2%
	I don't know	18	2.9%
The correct behaviour for a child less than 1 year and exposed to swallowing or inhaling a foreign object	Go to ER	175	28.6%
	Abdominal compression (while lying down)	94	15.4%
	Abdominal compression (while standing)	47	7.7%
	I'll do back blows and chest presses	186	30.4%
	I will try to remove it	91	14.9%
	I don't know	18	2.9%
The correct behaviour for a child less than 5 years and exposed to swallowing or inhaling a foreign object	Go to ER	172	28.2%
	Abdominal compression (while lying down)	76	12.4%
	Abdominal compression (while standing)	87	14.2%
	I'll do back blows and chest presses	170	27.8%
	I will try to remove it	87	14.2%
	I don't know	19	3.1%
The correct behaviour for a child more than 5 years and exposed to swallowing or inhaling a foreign object	Go to ER	167	27.3%
	Abdominal compression (while lying down)	54	8.8%
	Abdominal compression (while standing)	150	24.5%
	I'll do back blows and chest presses	150	24.5%
	I will try to remove it	68	11.1%
	I don't know	22	3.6%
When should you go to the ER when your child has swallowed or inhaled a foreign object?	You must go to the emergency centre in all cases	321	52.5%
	Depends on the type of foreign body even if there are no symptoms	200	32.7%
	If there are symptoms	66	10.8%
	No need at all	11	1.8%
	I don't know	13	2.1%
What is the correct action that you will do if the child suffocates and his airway is completely blocked?	I will do first aid (CPR)	299	48.9%
	Go to ER immediately	287	47.0%
	I don't know	25	4.1%
Not suffocating is a sure sign that the FB is disappearing	Agree	201	32.9%
	Disagree	410	67.1%
If the foreign body does not cause any symptoms, it is okay to delay its removal	Agree	93	15.2%
	Disagree	518	84.8%

**Table 3. Distribution of parental practice regarding aero-digestive paediatric foreign bodies swallowing, Western region, Saudi Arabia**

Parents practice	No	%
<b>Do you buy your children toys that contain small parts?</b>		
Never	188	30.8%
Rarely	195	31.9%
Sometimes	180	29.5%
Always	33	5.4%
Usually	15	2.5%
<b>Are small items out of children's reach?</b>		
Never	28	4.6%
Rarely	21	3.4%
Sometimes	49	8.0%
Always	124	20.3%
Usually	389	63.7%
<b>Do you let your children under 5 years old eat alone (without adult supervision)?</b>		
Never	263	43.3%
Rarely	143	23.5%
Sometimes	143	23.5%
Always	42	6.9%
Usually	17	2.8%
<b>Do you let your children under the age of 5 play on their own (without adult supervision)?</b>		
Never	176	28.8%
Rarely	176	28.8%
Sometimes	175	28.6%
Always	69	11.3%
Usually	15	2.5%

## Discussion

The current study aimed to assess parental knowledge and practices toward foreign body ingestion or inhalation in children in Saudi Arabia. Foreign body aspiration (FBA) is a serious condition with a high mortality rate, chiefly if management is delayed. Children who are below the age of three years are at a higher danger of FBA (11). Late diagnosis is frequently due to the non-specific clinical presentation with no witness to the aspiration event (12). Seeing of aspiration events, frequently by parents or caregivers, with succeeding in telling the treating physician is helpful for early detection and intervention (13, 14). Many types of foreign bodies have been reported in the literature; mostly, aspirated foreign bodies are toys, sweets, jewels, batteries, rocks, and magnets (15). The obstruction triggered by foreign bodies may cause impaired oxygenation and ventilation, ending with morbidity or mortality. Hypoxic–ischemic brain injury is the main mechanism of death followed by pulmonary haemorrhage (16, 17). Recurrent pneumonia, neuro-skeletal disability, pulmonary abscess, and bronchiectasis were also reported complications (18-20).

The current study revealed that nearly all the parents (93%) knew about swallowing or inhaling foreign objects. Also, the majority of the study parents know about the most reported age more likely to swallow or inhale foreign objects (97.8% reported less than 5 years). As for the items that may be at risk of being inhaled or ingested by children, more than three quarters of the parents selected all mentioned subjects including coins, plastic games, nuts, and batteries which are consistent with literature findings (15, 17). Also, more than 90% of the parents know that the child is in danger and they will take them to the emergency immediately in case of swallowing a foreign object such as batteries. Regarding the correct actions if the child is exposed to swallowing or inhaling a foreign object, going to ER was the most reported if the child is aged less than 5 years or more than 5 years (28.2% and 27.3%, respectively) while doing back blows and chest presses was the most reported for children aged less than 1 year (30.4%). Doing back blows and chest presses was reported by about one quarter of the parents if the child is aged less than 5 years but it was combined with Abdominal compression (while standing) in children aged 5 years or more. Going to ER in all cases was reported by more than half of the parents while one third of them said

said that going to ER depends on the type of foreign body even if there are no symptoms and 10% will go to ER if there are symptoms. This explains high morbidity and mortality rates due to late complications for asymptomatic ingested or inhaled foreign bodies especially those not witnessed by parents or children's caregivers. The surprising finding was that less than half of the parents will do first aid (CPR) for suffocated children but authors did not ask if they know the correct mechanism of doing this procedure. Also, another disappointing finding was that a very low percentage (15%) of the parents think that they could delay foreign body removal if there are no associated clinical symptoms which means more likelihood for developing complications with higher mortality rate. Also, one third of the parents considered absence of child suffocation is a sure sign that the FB is disappearing, which is not correct. Other studies showed similar findings. Fatimah A et al. (21) conducted a similar study and found that about 60% of participants were aware of aerodigestive foreign bodies. In regard to the management of child with aerodigestive foreign bodies in different age groups, for children of age group 1 year and less, about (34.9%) of participants were aware of the management. However, there is misunderstanding of managing child aged 5 years and less where only 5.6% of participants were aware of the management in this age group. As regards children more than 5 years old, only 36.2% of parents were aware of the management. Almutairi AT et al. (22) reported that parents with poor and good knowledge regarding foreign body aspiration in children were 61.3% and 36.9% and those with poor and good practices were 55.3% and 44.7%, respectively. El Bahnasawy (23) found that 59% of mothers had poor knowledge, 28% were average, and only 13% had good knowledge regarding FBA. On the other hand, AlShakhs et al. (24) had different findings. Their study showed that the awareness toward aero-digestive paediatric foreign bodies was high (60.3%) though, only 36.2% reported to have awareness regarding its management. These assessments and similar findings have been validated by many studies (25-28).

Regarding safe practices, the current study showed that more than 70% of the parents buy children toys that contain small parts but the majority of them (more than 95%) keep small items out of children's reach and about half of them never let their children under 5 years old eat alone.

## Conclusion

In conclusion, aero-digestive foreign bodies can have serious consequences. Our study revealed that parental knowledge and practices toward FBA were on average (but not satisfactory). On the other hand, safe practice especially keeping small objects out of children's reach was high but observing young aged children while playing was unsatisfactory.

## Acknowledgments

The authors gratefully acknowledge all data collectors and participants.

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