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ORIGINAL ARTICLE

Parental Role in Recognition, Prevention and First Aid Management of Foreign Body Aspiration amongst Children

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ABSTRACT

Background: Foreign body aspiration (FBA) is a commonly observed, fatal but preventable condition in children. To reduce the incidence of FBA, it is essential to provide parents with knowledge and guidelines regarding prevention and management of FBA.
Objectives: To assess parental knowledge and parental role in prevention and first aid management of foreign body aspiration in children.
Methods: A descriptive cross-sectional study was carried out at Mayo Hospital, Lahore from January 2019 to September 2019. After IRB approval and informed consent, 151 parents were enrolled through convenient sampling. Data was recorded in a structured questionnaire and analyzed through SPSS version 26.
Results: Breathlessness and vomiting were recognized as symptoms of FBA by 49.7% & 7.3% parents respectively. Hand clutched to throat, color & voice change were recognized as signs by 6.6 %, 9.9 % &10.6 % of the parents. As a first aid measure, 66.2% of individuals knew about back slaps, while only 2% were aware of abdominal thrusts. Literate parents were well aware of the facts that children under the age of three should not consume seeds, hazelnuts, and hard nuts and the child should not laugh or talk while eating compared to illiterate parents ($p<0.05$)
Conclusion: Majority of the parents are not well aware of signs, symptoms, preventive measures and first aid measurements regarding FBA.

Key Words: Foreign body aspiration, prevention, first aid management

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INTRODUCTION

Foreign body aspiration (FBA) is the inhalation of the edible, non-edible or pharyngeal/gastric contents into the larynx and lower respiratory passages,[1] whereas choking refers to varying degree of airway obstruction due to an aero-digestive foreign body. The obstruction interferes with ventilation that leads to asphyxia and even death. Choking due to FBA causes almost 40% of accidental deaths in infants and substantial complications. Most commonly

aspirated items include food, coins, toys, and balloons.[2]

The major risk factors of FBA in children include incomplete dentition, playing, running, or laughing while eating and their curiosity to explore everything by putting it in mouth. Considering the consequences of FBA, it is important to initiate programs that raise awareness among parents about its risk factors and high incidence rates in young children and to equip the parents with basic measures to prevent it.[3,4]

Children younger than three years old have the highest prevalence of this disorder.[5] Playing with small toys or eating peanuts were proposed as a potential cause of FBA. The vast majority of parents were unaware that FBA may be caused by eating peanuts or playing with small toys, or that their child's abrupt choking and coughing could be signs of FBA.[6] It was found that the fatal and non-fatal cases of choking remained high in children.[7] Marital status, gender, and educational attainment were found to be associated with knowledge about foreign body aspiration.[8]

FBA is a life-threatening yet preventable condition in pediatric age group that demands increased parent education and awareness since parents are the key persons who are involved in care and feeding of young children. Less awareness of parents regarding risk factors and prevention of FBA is an important determinant placing children at higher risk for FBA and associated complications. To date, there are no published reports on awareness among parents about FBA in children in our local setting. The scope of this study is to highlight the importance of equipping the parents with knowledge and guidelines for proper feeding care which may be the most vital factor in reducing incidence of FBA.

METHODS

It was a cross-sectional study, carried out at Pediatric & ENT department, Mayo Hospital, Lahore from January 2019 to September 2019. A sample size of 151 was estimated by using 95% confidence level, 8% absolute precision with expected percentage 47.4% of parents who knew that they should not give groundnuts/seeds or small toys to children <3 years 50%. Ethical permission was obtained from institutional review board of King Edward Medical University (No.1995/RC/KEMU). Informed written consent was obtained from all the study subjects. Parents having youngest child less than five years of age were included in the study. Convenient sampling technique was used. Parents whose children were severely ill (admitted in ICU or emergency) were excluded from the study. A self-designed questionnaire was used which was pre-tested before using for the present study. It included demographic profile (age, gender of parent, age of youngest child, number of kids, level of education of parents), questions regarding basic knowledge about foreign body (knows about common age group, foods that may cause FBA (carrot, seeds, walnut, hazelnut, grapes, cucumber, hard nuts), small toys, leaving kids unsupervised, let the child hold toy while crying, talking or laughing, knowledge about the prevention of FBA and first aid given after foreign body ingestion. Educational status was stratified into literate and illiterate, where illiterate means a person who could not read 3 lines written in national or regional language and has no formal schooling. The questionnaire was translated in Urdu and data collector

explained the respondent and recorded the responses.

Statistical Analysis

Data was analyzed through SPSS version 26. Variables were presented as frequency and percentages. Chi square and phi test were applied. p value< 0.05 was considered as statistically significant.

RESULTS

Out of 151 respondents 20 (13.2%) were fathers and 131(86.8%) were mothers. Among them 11(7.3%) were below 20 years, 135(89.4%) between 20-40 years and remaining 5(3.3%) were above 40 years of age. 145(96%) Parents had 5 or less children and 6 (4%) had more than 5 children. Age of the youngest child was <1yr in 57 cases, between1-3 years in 53 and 3-5 in 41 cases. Among parents 34(22.5%) were uneducated and 117(77.48%) were educated.

Among subjects 60(39.7%) had knowledge about most probable age of FBA. Regarding knowledge about signs and symptoms of FBA, 16(10.6%) knew about acute onset of cough, 10(6.6%) recognized hand clutched to throat as a sign, 15(9.9%) mentioned change in color as a sign, 16(10.6%) considered change in voice, 11(7.3%) appreciated vomiting as a symptom, 75(49.7%) appreciated breathlessness as a symptom and 18(11.9%) said that they have no idea about signs and symptoms of FBA.

103 Parents had adequate knowledge regarding first aid. 100(66.2%) knew about slapping at the back and 3(2%) knew about abdominal thrust. 48(31.8%) parents said they will seek medical care in such a situation.

Table 1: Basic Knowledge Regarding Foreign Body Aspiration

Knowledge about Risk Factors	Frequency n (%)	Frequency n (%)
Foods child <3 years of age can eat independently?	Yes 99(65.6%)	No 52(34.4%)
Carrot	66(43.7%)	85(56.3%)
Seeds	102(67.5%)	49(32.5%)
Almonds	83(55%)	68(45%)
Hazelnut	130(86.1%)	21(13.9%)
Grapes	124(82.1%)	27(17.9%)
Cucumber	52(34.4%)	99(65.6%)
Hard Nuts Child<3 years of agecan play with very Small toys	130(86.1%)	21(13.9%)
No supervision is needed while playingfor a child <3 years of age	12(7.9%)	139(92.1)
Crying child<3 yearsof age with small toyin hand is not recommended	102(67.5%)	49(32.5)
Talking or laughingwhile eating is not recommended in child<3 years of age	47(31.1)	104(68.9)

Table 2: Preventive Practices of Parents Regarding ForeignmBody Aspiration

Preventive Role of Parents	n=151	Percentage
I supervise him/her	138	91.4%
I feed him/her or allow eatingin sitting position.	130	86.1%
I don't give him small objects.	113	74.8%
I don't give him grainy or solid foods as it is like peanuts etc	100	66.2%

Table 3: Association of Knowledge Factors with Literacy Regarding Foreign Body Aspiration

Factors	Response	Illiterate n=34	Literate n=117	χ^2 (p value)	Phi (p value)	95%CI Lower	95%CI Upper
Child< 3y can eat Carrot	**Yes**	20	79	.883 (.347)	-.076 (.347)	.313	1.50
	No	14	38				
Child< 3y can eat Seeds	**Yes**	20	46	4.074 (.044)*	.164 (.044)*	1.01	4.79*
	No	14	71				
Child< 3y can eat Almonds	**Yes**	25	77	.716 (.398)	.069 (.398)	.615	3.38
	No	9	40				
Child< 3y can eat Hazelnut	**Yes**	24	59	4.326 (.038)*	.169 (.038)*	1.03	5.37*
	No	10	58				
Child< 3y can eat Grapes	**Yes**	31	99	.947 (.330)	.079 (.330)	.519	6.805
	No	3	18				
Child< 3y can eat Cucumber	**Yes**	30	94	1.118 (.290)	.086 (.290)	.588	5.730
	No	4	23				
Child< 3y can eat Hard Nuts	**Yes**	5	47	7.566 (.006)*	.224 (.006)*	.093	.711*
	No	29	70				
Child< 3y can play with Small toys	**Yes**	29	101	.023 (.878)	-.012 (.878)	.310	2.72
	No	5	16				
For Child< 3y NoSupervision is required	**Yes**	7	5	9.585 (.002) *	.252 (.002) *	1.71	19.7*
	No	27	112				
For Child< 3y Crying with toy notrecommender	**Yes**	4	45	8.566 (.003)	-.238 (.003)	.070	.646*
	No	30	72				
For Child< 3y Laughing/ talkingwhile eating is not recommender	**Yes**	17	87	7.29 (.007) *	-.220 (.007) *	.156	.760*
	No	17	30				

Chi square test and Phi test applied. 95% CI also calculated, p-value <0.05 was considered statistically significant

According to parents' education for FBA prevention is much needed. 8 (5.3%) of the parents suggested their knowledge should be improved through pamphlets, 52 (34.3%) through educational campaign, 40(26.5%) through electronic media, 28(18.5%) through education during maternity visits and 23(15.2%) suggested through all these means. Frequency & percentages of knowledge regarding factors that may cause FBA is provided in Table 1.

Frequency & percentages of steps that parents practice in order to prevent FBA are presented in Table 2. Association of knowledge factors with literacy has been presented in Table 3.

Literate parents were significantly different from illiterate parents in knowing that <3 yrs old child should not eat seeds, Hazel nuts, hard nuts, Supervision is required for thechild and child should not laugh or talk while eating (p value < 0.05).

DISCUSSION

FBA is a serious condition that affects children and needs to be treated right away to prevent complications and permanent lung damage. The majority of childhood accidental deaths are caused by tracheobronchial foreign body aspiration, which is a life-threatening emergency.[9, 10]

In our study our questions were focused on children < 3 years of age as this is the commonest age group. Similarly, studies reported that prevalence, morbidity and mortality of FBA are high among younger children < 3years of age and were even a more common cause of accidental death in infants.[10,11] In a study conducted at ENT department of Mayo Hospital Lahore, out of 583 patients received with FBA, 401(68.78%) were below 10 years of age wherein 110(19.89) patients were 3 years old.[5]

Our study focused on checking knowledge regarding food items to be offered to children. Parental knowledge was not adequate. A study conducted in hospital settings found that majority of foreign bodies were organic in nature. Better prognosis was observed in cases where symptoms and signs were present, location of FB was accessible or FBA was witnessed, all of them led to access medical care timely.[11,12]

In our study parents' knowledge regarding small toys was assessed which was not adequate. Similarly, In a comparative study carried out in Saudi Arabia one third of the parents in both studied groups did not

recognize small toys or peanuts as a cause of FBA.[6] A study suggested parents should be educated to raise their awareness of tracheobronchial FBA and should refrain from giving their children small objects that could potentially obstruct the airways. If FBA is suspected, the child must be shifted to the hospital immediately. Parental neglect may be significant factors in the delay of a child's diagnosis.[12] Delay in receiving treatment leads to more complications, morbidity & mortality.[13] In contrary to our study, another study carried out in Nigeria showed that there was good parental knowledge regarding FBA and 47.4% knew that they should not give groundnuts/seeds or small toys to children <3 years.[8]

In our current study parents did not identify all the symptoms and signs of FBA. Likewise, another study showed a higher percentage of parents unaware of the symptoms of foreign body aspiration. Authors mentioned that FBA presents clinically with a wide array of signs and

symptoms. Amongst them, cough and wheezing are the most common symptoms followed by breathlessness. FBA should also be considered in children presenting with atypical or prolonged pulmonary symptoms. If it goes undiagnosed, it may lead to chronic and irreversible lung injury. One of the factors contributing towards complications is that parents were unaware of clinical signs of FBA, such as sudden choking and coughing.[14] In another study regarding clinical presentation of FBA, 14%and 27% of mothers did not know that sudden choking and coughing were symptoms suggesting FBA, respectively.[6] According to the National Safety Council, in 2016 the rate of fatal choking in American children <5 years of age in the general population was 0.43 per 100,000. However,a previous study analyzed the rate of non- fatal choking in children under the age of 14 to be 20.4 per 100,000 populations.[7]

In our study parents suggested different means should be utilized to impart necessary education among the population. A large number of participants indicated that electronic media including internet and television should be used, almost half were in favor of educational campaigns, some suggested education through medical personnel and others suggested all of these. A study concluded that school children also had inadequate knowledge just like mothers regarding FBA and among them only a small number had been trained in first aid.[15] Another study suggested that Prevention is the most important key step that needs to be considered. Despite all such measures, even if FBA is found to occur, parents must be educated about its prompt management and first aid step at secondary prevention level.[12] Researchers found that sending parents of children seen at a paediatric otolaryngology clinic a short video intervention via email link improved their understanding of choking risks and how to avoid them. Parents may be more receptive to hearing about ways to prevent choking at an otolaryngology clinic.[16] Studies suggested that parents should be trained in first aid to prevent dire consequences.[17,18] In a comparative study newer mobile application-based education proved to be more effective than booklets & CDs.[1] Public education campaigns, modifications in product design, medical staff education and improvements in relevant medical equipment were proposed as preventative measures for aspiration and its consequencesin a research.[9,10]

Parental knowledge regarding small toys and holding toys while crying was not up to the mark in our study. Toys where provided happy moments to kids and help them in development, if not supervised or use as per age precaution may be ingested or aspirated and cause severe complications. Parents must be educated and vigilant in preventing such events.[19] Another study mentioned that evaluation of parental knowledge will help us direct the type and extent of resources that need to be utilized in order to enhance parental knowledge and contribute to community by lowering frequency of hospital admissions and mortality related to this condition. Inability to recognize a foreign body aspiration in children and subsequent delay in administration of first aid treatment in them leads to dire consequences. This presses the importance of imparting education among parents that prepares them to recognize and manage such events thereby decreasing morbidity and mortality associated with it.[20] Multiple platforms including electronic media, print media, education through campaigns or

medical personnel can be engaged in achieving an optimum awareness among the parents. Literate parents had significantly different knowledge regarding prevention of FBA in our study and in published literature.[21] Another study found that marital status, gender, and the level of education were found to be statistically associated withknowledge of FBA.[8]

Strengths of the present study is to bring attention to the neglected topic. Recommendations of the current study are toplan interventional studies on community level where after recording baseline knowledge educational intervention must be done and followed up for the knowledge and practice improvement. Educational counseling may be done in prenatal visits.

Limitations of our study were single centre, small sample size, non-probability sampling.

CONCLUSION

Our study reflected that a significant number of parents lack basic and essential knowledge for prevention, recognition & management of foreign body aspiration in children.

Conflict of interest:
Authors declared no conflict of interest.

Contributors:

FS: Design of the work, data analysis, write up, final revision and approval.

HJ: Data collection, data entry, write up and interpretation of data for the work.

SI: Revising it critically for important intellectual content, literature search

SS: Investigation, literature search, final revision and approval.

All authors approved the final version and signed the agreement to be accountable for all aspects of work.

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Data sharing statement:

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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