A STUDY ON THE ASSESMENT OF THE MAGNITUDE THE CAUSES AND OUTCOMES OF ACUTE UPPER AIRWAY OBESTRUCTION AMONG CHILDREN AT BLACK LION SPECIALIZED HOSPITAL DEPARTMENT OF PEDIATANDCHILDHEALTH

M.SC. Thesis

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ASSEMENT OF THE MAGNITUDE , CAUSE AND OUTCOMESOF ACUTE UPPER AIR WAY OBESTRUCTION IN TIKURE ANBESSASPECIALIZEDHOSPITALOFPEDIAATRICS AND CHILD HEALTH DEPARTMENT AT PEDIATRIC EMERGENCY UNIT

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ACRONYM/ABBREVIATIONS

A.A – Addis Ababa

AAU –Addis Ababa University

ACLS-Advanced Cardiac Life Support

ARI -Acute Respiratory Infection

AUAO- Acute upper Air way Obstruction

BLS-Basic Life Support

CHS -College of Health Sciences

CPR – Cardiopulmonary Resuscitation

EMJ-Ethiopia Medical Journal

EPI – Expanded Program on Immunization

ESOPC - Ethiopian Society of Pediatrics and Child health

FBA- Foreign Body Aspiration

FMOH-Federal Ministry of Health

Hib – Haemophylus influenza type b

IRB - Institutional Review Board

PICU – Pediatric Intensive Care Unit

SPNN – Southern Peoples Nations Nationalities

SPSS - Statistical Package for Social Sciences

TASH-Tikur Anbessa Specialized Hospital

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ABSTRACT

Background:

Acute upper airway obstruction is a common cause of respiratory emergencies among children. However, the magnitude, the causes, and the outcomes of acute upper airway obstruction in Ethiopia are not studied and documented.

Objective: To determine the magnitude, the causes, and the outcomes of Acute Upper Airway Obstruction among pediatric patients who visited the pediatric emergency department of Tikur Anbessa Specialized Hospital.

Methodology: Retrospective record review based on the institutional record of children who had Acute upper airway obstruction and visited the pediatric emergency unit over a one year period was conducted in Tikur Anbessa Specialized Hospital between July 2012 to June 2013 relevant data were collected from institutional records of all children visited the pediatric emergency unit due to Acute upper air way obstruction. Major causes of Acute upper air way obstruction were identified and its outcomes were determined. SPSS version-16 was used to verify the association between selected socio demographic characteristics and clinical conditions with the outcome of Acute upper air way obstruction.

Result:. During the study period 2,327 children have visited the pediatrics emergency OPD due to different problems. Among which 161 (6.9%) children were presented with acute upper airway obstruction. Croup was found to be the most common cause of Acute upper airway obstruction(75.8%)followed by foreign body aspiration(9.9%). Majority of the patients (68.9%) were treated at the emergency OPD and sent home with improvement after they were kept for few hours for observation. The study also revealed that 7(4.%)Patients were died of Acute upper airway obstruction. Statistically significant association was not observed between socio demographic characteristics, clinical conditions and the outcome of upper air way obstruction.

Conclusion and Recommendation

On average, at least three children with Acute upper airway obstruction visited the emergency OPD per week during the study period. The causes of acute upper airway obstruction were varied although infectious diseases (croup, bacterial tracheitis, retropharyngeal abscess, and peritonsillar abscess) were responsible for the majority of the cases (82.6%). Seven patients died of upper airway obstruction during the study period. Therefore, improving the Acute upper air way obstruction diagnosis and management capacity of health workers and the clinical set up of the pediatric emergency unit is crucial to provide an immediate and aggressive response.

1. INTRODUCTION

1.1 BACK GROUND

Acute upper airway obstruction from any cause can be a life-threatening emergency. Complete obstruction will result in respiratory failure followed by cardiac arrest in a matter of minutes[1]. This situation requires an immediate, aggressive response. In contrast, a child with a partial obstruction may initially have an adequate airway. However, this condition can deteriorate rapidly. Under these circumstances, providing supportive care and mobilizing resources for definitive airway management may be the most appropriate intervention[2].

Compared with adults, infants and young children have small airways and can quickly develop clinically significant upper airway obstruction[3]. The increased work of breathing that result can rapidly progress to respiratory failure because these young patients have less respiratory reserve. Therefore, prompt recognition of airway compromise and the institution of appropriate therapy are necessary to prevent progressive deterioration in respiratory function and improve outcomes[4].

The causes of upper airway obstruction in children are very extensive[5,6] and require clinical expertise, skill and experience in recognizing the important circumstances and diagnoses that can rapidly progress into a life-threatening situation. However, the causes and outcome of life-threatening upper airway obstruction in children of this region remain less well determined. Our experience with severe upper airway obstruction requiring intensive care not only illustrates the heterogeneity and wide variety of its causes, but also, more importantly, highlights several differences unique to this region when compared with PICU counterparts in the developed nations of the temperate regions.[7,8]

The diagnostic categories requiring intensive care in developed nations are heterogeneous with viral croup, the predominant cause for admission for life-threatening upper airway obstruction.[9]However, life-threatening upper airway obstruction encountered in children of the developing nations and the tropics, in particular, has not been extensively documented. The diagnostic categories may be expected to be different from those in developed nations as a result of peculiarities in the climate, paucity of health-prevention strategies available and the socioeconomic environment.[10, 11]

1.2 STATEMENT OF THE PROBLEM

Any condition that causes upper airway obstruction can be life-threatening. However, most children have an identifiable etiology and respond well with prompt recognition and appropriate intervention[12].There are several causes of upper airway obstruction. Croup, epiglottitis, foreign body aspiration, retropharyngeal and peritonsilar abscess, and bacterial tracheitis are some of the causes. Management of these conditions is significantly different and accurate diagnosis is crucial[13].

Infants and toddlers use their mouths to explore their surroundings. Foreign body aspiration is a common cause of morbidity and mortality in children especially between ages 18 months to 3 years. Pre ambulatory toddlers may aspirate objects given to them by older siblings. [14]Inhalation of a foreign body into the respiratory tract may result in an acute life-threatening obstruction. More than 300 deaths per year occur as a result of foreign body aspiration in the United States.[15]Undiagnosed, retained foreign bodies may also cause serious complications like pneumonia, wheezing, bronchiectasis, or atelectasis. A high index of suspicion is generally required to avoid significant morbidity and mortality. [16,17]

The clinical profile of severe upper airway obstruction, a challenging acute pediatric emergency, has not been extensively documented in the developing nations of the tropics. Studies show that there is a significant shift in the nature of upper air way emergencies and these findings confirm the ongoing requirement for caution in dealing with a suspected airway emergency.[18, 19]

Despite the fact that the problem exists in Ethiopia and many children have been presented with acute upper air way obstruction in most Hospitals' pediatrics units, there are no researches conducted that indicate the magnitude, causes and outcomes of acute upper air way obstructions in the pediatric population.

This study will try to show the magnitude, causes and outcomes of acute upper air way obstruction among pediatric patients age one month to 12 years who visited the pediatric emergency department of Tikur Anbessa Specialized Hospital during the study period. The study result will play some role in improving the services in pediatrics emergency units and provide recommendations on ways of reducing the mortality and morbidity associated with pediatric upper airway obstruction.

1.3 SIGNIFICANT OF THE STUDY

Acute upper air way obstruction from any cause is truly very extensive and a life-threatening event among children in developing countries like Ethiopia. According to the severity of symptoms and degree of air way obstruction, Providing basic and advanced life support (BLS, ATLS), buck rub, and Heimlich maneuvers are necessities and prevent long-term complications. This will contribute to the reduction of children morbidity and mortality.

This could be only achieved when Health professionals that provides the service knows the magnitude, causes and outcomes of the problem. Thus, this study that will be conducted inTASH pediatrics emergency Unit will give a clue for health managers and decision makers of AARHB, FMOH, and other concerned organizations of Addis Ababa city. It will also be a base line survey for others that have similar interest to do research in this area.

1.4 OBJECTIVE

General Objective

To determine the magnitude, causes and outcomes of acute upper air way obstruction among pediatric patients who visited the pediatric emergency unit of Tikur Anbessa Specialized Hospital.

Specific Objective

1. To assess the magnitude of pediatric acute upper air way obstruction.
2. To determine the causes of pediatric acute upper airway obstruction.
3. To evaluate the outcome of pediatric acute upper airway obstruction.

2. REVIEW OF LITERTURE

Acute Upper airway obstruction is one of the emergency health problems that affect children. Literature show that there are different causes of upper airway obstruction with different reports of incidence.

Chan PW, et al. found that viral croup (29%) was the most common cause of severe upper airway obstruction, followed by mediastinal malignancy (13%), bacterial tracheitis (11%), Pierre Robin syndrome (11%) and adenoid hyperplasia (11%). There were no admissions for acute epiglottitis. Thirty episodes (48%) required ventilation and only two patients required a tracheostomy. The overall mortality was 11%, and outcome is generally favorable except in those with bacterial tracheitis and mediastinal malignancy.[20]

Acute epiglottitis, prior to the introduction of routine immunization against Homophiles influenzae type b (Hib) disease, and viral croup predominate the causes of life-threatening upper airway obstruction in the developed nations of the temperate region.[21,22]However, acute epiglottitis is not encountered as a cause of severe upper airway obstruction in Malaysian children, although routine Hib immunization is not part of the national immunization program. This low prevalence of acute epiglottitis is a universal observation in other less-well developed tropical nations. It has even been described as a disease unknown to this part of the world. [23, 24]

Foreign body aspiration is an important and preventable cause of childhood mortality and morbidity. Serious complications occur both in high income and low-middle income countries in a considerable proportion of cases (10% and 20% respectively) [25].A meta-analysis of 174 published papers showed that airway foreign body most commonly occurs in young children, almost 20% of children who have inhaled foreign bodies being between 0 and 3 years of age. Organic foreign bodies, particularly nuts, are the most documented objects while, among inorganic foreign bodies, the greatest pooled proportion has been recorded for magnets, which can be particularly destructive in each location. Acute and chronic complications seem to occur in almost 15% of patients.[26]Similarly, among 152 Nigerian children (age range 5 days to 16 years, mean age 4.64yr.)that underwent tracheotomy for acute upper airway obstruction, the 3 to 5 years age group accounted for the majority of the cases, and upper air way obstruction due to foreign body in the larynx was the commonest indication for tracheotomy.[27]

A study of 174 children with foreign body aspiration in Istanbul, Turkey showed that the mean age was 45.4 months (range, 5–216 months). Seventy-six percent of the children were less than 3 years old. Ninety (51.7%) of the 174 children had their foreign bodies removed within 3days, 50 (28.7%) and 34 (19.6%) patients were diagnosed to have foreign body aspiration within 4–30 days or after more than 30 days following the aspiration, respectively.[28]

The result of a retrospective study at the Royal Belfast Hospital showed a gradual decrease in the number of admissions due to croup. Acute epiglottitis admissions decreased markedly after 1992 but rose again in 2000, with a peak in 2002. Bacterial tracheitis is now the most common pediatric airway emergency requiring PICU admission and its incidence has been steadily increasing since 1990[17,] Peritonsillar abscess is one of the causes of upper airway obstruction. Reports in the literature with regard to the incidence of bilateral peritonsillar abscess is reported to reach 4.9%.[30]

3. MATERIAL AND METHODOLOGY

Methods

Study area and Period

The study was conducted at Addis Ababa University, Collage of Health Sciences, Department of Pediatrics and Child Health, Pediatric Emergency unit in Tikur Anbessa Specialized Hospital that is found in the capital city of Ethiopia, Addis Ababa. The pediatric emergency unit is functioning 24 hours a day and provides emergency service for patients who are referred from different health institutions. It is a place that receives the sickest children and is definitely the main portal of entry for children who need prompt admission and management.

We performed a retrospective case note review in an 47 bed multidisciplinary pediatric Emergency unit (PEU) of a university children's Hospital serving for a large urban population and tertiary referral services to the rest of the country .

Study Design

The study utilizes a retrospective record review study design based on the institutional records of pediatric emergency patients in Tikur Anbessa Specialized Hospital.

Source Population

All patients who visited the pediatric emergency unit of Tikur Anbessa Specialized Hospital during the study period.

Study Population

All patients age one month to twelve years presented with acute upper airway obstruction between July 2012 to June 2013.

Inclusion Criteria

The recommendation of the International Society for Pediatrics age groups of one month to twelve years

Exclusion criteria

1. Patients who have lower respiratory obstruction & chronic respiratory problem.
2. Age greater than 12 years or less than one month.

Sample size determination

This Retrospective Study included 161 Children records who were treated for croup, Foreign body aspiration, Laryngeal papilloma, Bacterial tracheatis, Retropharyngeal abscess, Anaphylaxis, Peritonsillar abscess, and for Trauma, at Addis Abeba University pediatric & child Health Hospital, AA Ethiopia from July 2012 to June 2013.

We recorded the patients clinical presentation, confirmed diagnosis, co morbidity, length of stay, measure taken, nature of foreign body and where the foreign body is found and the type of foreign body and disposition.

The sample size was determined by using single proportion formula ($n = [Z \alpha / 2]^2 P (1-p] / d^2$) at 95% confidence interval, where, $Z \alpha / 2 = 1.96$, P = prevalence of 50% is taken since there is no previously research data in this area and d = 5% of marginal error.

$$n = Z^2 p (1-P) / d^2$$

$$= 1.96^2 (0.5 \times 0.5) / 0.05^2$$

$$= 384$$

Study variables

Independent variables

Socio demographic (age, gender, residence, source of referral)

Dependent variables

The main dependent variables are chief compliant, confirmed diagnosis, co morbidity, elapsed time after the clinical presentation, nature of foreign body, measure taken, outcome & disposition.

Data collection Methods

Data were collected from patient cards and record books of the pediatrics emergency OPD of Tikur Anbessa Specialized Hospital using pre-structured data collection format, first sources of data was identified (patient cards or recording books) and two data collectors were selected and trained on the data collection tools. Detailed discussion on every data item collected and how to resolve a potential problem were made. Pre-testing the data collection format were done before the entire data collection time. The collected data was checked every day by the supervisor and the principal investigator for its completeness, eligibility, and appropriateness. Upper airway is defined as the part of the airway above the carina in this study.

Data Processing and Analysis

Data was entered in the Statistical Package for Social Sciences software (version 16). Data cleaning was done before starting the analysis. Both descriptive and analytical statistics were used as applicable. The magnitude, the causes, and the outcome of Acute upper air obstruction were determined. Finally data presented in text graphs and tables as appropriate. P-values less than 0.05 were taken as significant.

Ethical clearance

Since the data collections were anonymous which do not include names of individual patients and any other personal identifiers, there was no harm to the patients. Permission was obtained from the Pediatrics and Child Health Department and from the hospital. This was granted with a letter from the university (teaching institute) after getting ethical clearance from the Ethical Committee/IRB of Addis Ababa University, Collage of Health Sciences. The research was not place the data records under undue risk; rather were kept under locked boxes.

Plan for dissemination

Formal report of the study result will be submitted to all concerned bodies. The results will be used to formulate an appropriate management protocol and teaching aids.

4. RESULT

Socio-demographic characteristics of the study population

Two thousand there hundred and twenty seven children with different problems have visited the pediatric emergency OPD in Tikure Abessa specialized Hospital during the period from July 2012 to June 2013, Of which 161(6.9) children were presented with acute upper airway obstruction. The children ranged in age from 3 months to 11years (mean age, 2.7 years). One hundred nine (67.7%) were male and 52 (32.3%) were female. The majority of the patients (79%) were from Addis Ababa although patients came from all over the country except the regional states of Gambella and Benishangul-Gumuz.

Table 1: Socio-demographic characteristics of the study subjects (n=161)

	Frequency	Percent
Sex		
Male	109	67.7%
Female	52	32.3%
Address		
Addis Ababa	127	79%
Regional States	34	21%
Age group		
<12 months	32	19.9%
12-59 months	109	67.7%
>59 months	20	12.4%

Clinical characteristics of the study population

Among the 161 patients the majority had croup122 (75.8%). Foreign body aspiration was the second most common cause of upper airway obstruction16 (9.9%) followed by laryngeal papillomatosis (5.6%). Bacterial tracheitis, retropharyngeal abscess, anaphylaxis, peritonsillar abscess and blunt trauma were found to be causes of upper airway obstruction. No patient with

epiglottitis was brought to the emergency pediatric OPD of Tikur Anbessa Specialized Hospital. Patients with upper airway obstruction arrived at Tikur Anbessa Specialized Hospital as early as

4 hours and as late as 12 days (mean duration, 40.4 hrs; median, 28 hrs)

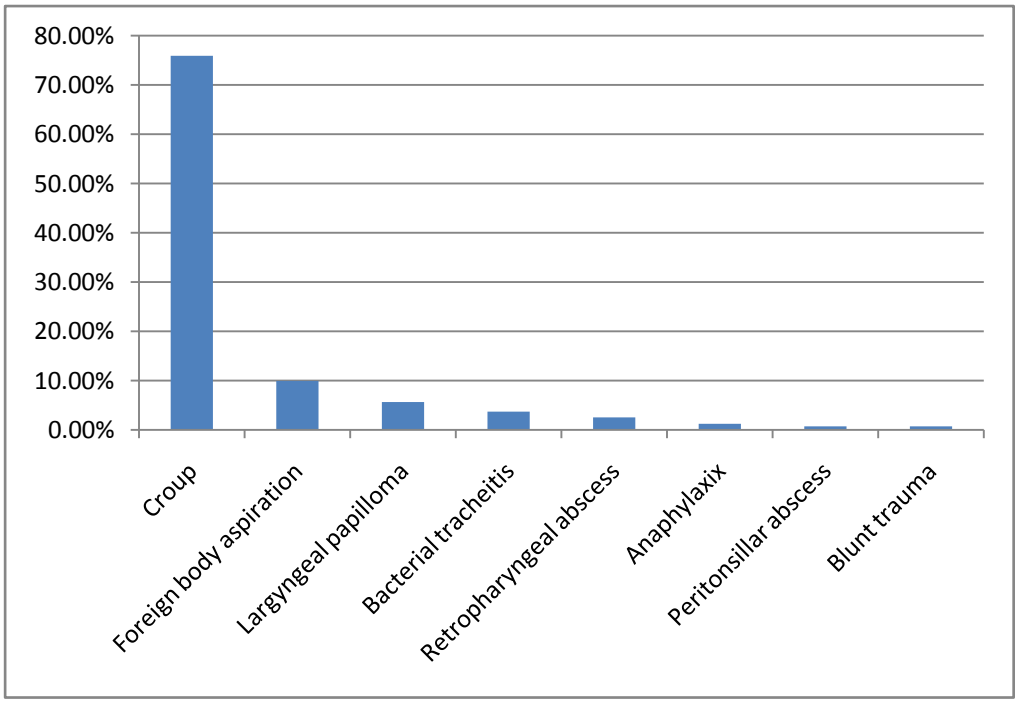

Figure 1 : Causes of Upper Airway Obstruction

The age of children with foreign body aspiration ranges from 9 months to 11 years (mean,5.1 years). As to the type of foreign bodies aspirated, seven patients (43.7%) had aspirated organic materials (peanut, maize seed, piece of bread, piece of bone). The tip of a plastic balloon was the second most common object to aspirated (n= 4; (25 %)). Piece of metals, disc battery, fragment of a stone, and chewing gum were among the foreign bodies removed from the upper airway. Five patients (31.2%) had aspiration pneumonia as complication.

Table:2 Types of Foreign Body Aspirated (n=16)

Types of Foreign Body	Frequency	Percent
Tip of a plastic balloon	4	25%
Peanut	2	12.5%
Maize	2	12.5%
Piece of a metal	2	12.5%
Piece of bread	2	12.5%
Fragment of a bone	1	6.25%
Fragment of a stone	1	6.25%
Chewing gum	1	6.25%
Disc battery	1	6.25%
Total	16	100 %

The majority of the patients (68.9%) were treated at the emergency OPD, kept for few hours for observation and sent home with improvement. Five patients were admitted to PICU and 36 patients (22.2%) were admitted to the wards. The majority (78.7%) of patients with croup were given dexamethasone injection. Nine patients were given steroid treatment with an initial working diagnosis of croup while the correct diagnoses were laryngeal papilloma (3 patients), bacterial tracheitis (3 patients), foreign body aspiration (2 patients), and retropharyngeal abscess (1 patient). Bronchoscopey was done for all patients with foreign body aspiration. Tracheostomy was done for five patients (4 patients with foreign body aspiration and one patient with bacterial tracheitis). One patient having bacterial tracheitis and another patient with foreign body aspiration required mechanical ventilation. Unfortunately, the patient with bacterial tracheitis died of his illness. Out of the nine patients with a diagnosis of laryngeal papillomatosis, micro debridement was done for only five patients as two of them died at the emergency OPD and the remaining two patients improved with steroid and supplemental oxygen administration.

Outcome

The upper airway obstruction did improve after treatment in the majority of the study subjects (95.7%). Seven patients (4.3%) died of their illness. Croup and laryngeal papillomatosis were responsible for the death of two patients each. Retropharyngeal abscess, bacterial tracheitis and peritonsillar abscess were responsible for the death of the remaining three patients. The youngest patient who died was a 17 month old child and the oldest was a 9.5 year old child (mean=4 year). Five of them were male and two of them female. Four of the patients who died came from Addis Ababa and the remaining three came from the regional states. The duration of the upper airway obstruction ranges from 8 hours (a 2 year old child from Addis Ababa with laryngeal papillomatosis) to 7 days (a 9.5 year old child from Oromiya with retro pharyngeal abscess)(mean=53.4hr). Four of these deaths occurred immediately after they arrived at the emergency OPD. Two of the 7 patients who died had pneumonia as co morbidity. Five patients out of the 16 patients (31.2%) having foreign body aspiration developed aspiration pneumonia.

Table 3: Profile of patients who died of Acute upper airway obstruction.

No	Age (month)	Sex	Address /Region	Diagnosis	Duration of illness	Co morbidity	Treatment
1	21	Male	A.A	Bacterial tracheitis	78 hrs	Pneumonia	Antibiotic, mechanical ventilation
2	44	Male	Tigray	Laryngeal papillomatosis	22 hrs		Steroid, nebulized epinephrine
3	96	Male	SPNN	Peritonsillar abscess	18 hrs		CPR
4	21	Female	A.A	Croup	36 hrs	Pneumonia	CPR
5	17	Female	A.A	Croup	44 hrs		Steroid, nebulized epinephrine
6	114	Male	Oromiya	Retropharyngeal abscess	168 hrs		Antibiotic, O2
7	24	Male	A.A	Laryngeal papillomatosis	8 hrs		CPR

Using different statistical tests we tried to evaluate whether or not the type of the diagnosis, the age, the sex, the address, the duration of the upper airway obstruction, the presence of co morbidity or complication, and the management the patient received have statistically significant association with the outcome of the patient. However, we did not find any statistically significant association between these variables and the outcome.

5. DISCUSSION

Acute upper airway obstruction is one of the life threatening emergency conditions responsible for pediatric emergency OPD visits by children [12]. To our best knowledge, this effort constitutes the first attempt to evaluate the magnitude, the causes, and the outcome of acute upper airway obstruction in children who visited Tikur Anbessa Specialized Hospital.

One hundred sixty one patients with acute upper airway obstruction visited the emergency pediatric OPD over a period of 1 year. Thirty four patients (21.1%) were referred from the regional states. This shows the danger these patients face travelling long distances with upper airway obstruction.

Croup is the most common cause of acute upper airway obstruction. This finding is similar to the findings of other studies [4,9,20].

The finding that mediastinal malignancy was the second most common cause of acute upper airway obstruction in one study [20] is not similar to our finding. In fact, we did not find a single case of upper airway obstruction secondary to mediastinal malignancy among our study subjects.

Bacterial tracheitis, a diagnosis responsible for only 3.7% of acute upper airway obstruction in our study, was found to be the most common pediatric airway emergency requiring PICU admission in a study conducted in Northern Ireland [19]. Similarly, a relatively higher percentage (11%) of children with acute upper airway obstruction had bacterial tracheitis in another study [20].

Although it is beyond the scope of our objective to describe the magnitude of airway foreign bodies in general (both upper and lower airways), we found out that a total of 76 patients had airway foreign bodies during the study period. Forty four patients (58%) had foreign bodies in the right main bronchus. This is exactly the same as the figure stated in Nelson Text Book of Pediatrics [14]. Only sixteen patients (~21% of all the airway foreign bodies) had foreign bodies in the upper airways. This is higher than the reported figure (10%) in Nelson Text Book of Pediatrics [14].

As to the type of foreign bodies aspirated, organic materials are the most common causing upper airway obstruction which is similar to the findings of a meta-analysis of a 174 published papers [26]. The tip of a plastic balloon was found to be the second most common object causing upper

airway obstruction (n= 4; (25 %)). However, if we consider airway foreign bodies in general (both upper and lower airways), 17 patients (22.4%) had aspirated the tip of these plastic balloons. When a plastic balloon being inflated by a child ruptures, the reaction force created by the explosion throws the tip (the mouth piece) of the balloon into the airways causing airway obstruction. Five patients out of the 16 patients (31.2%) having foreign body aspiration developed complication (aspiration pneumonia). This finding is higher than findings in other studies [25,26].

Although patients with laryngeal papillomatosis usually present with chronic and recurrent upper airway obstruction [16], nine patients presented with acute upper airway obstruction in our study. This could be explained by the rapid growth of papillomas that occur in some patients [16]. The upper airway obstruction of two patients with laryngeal papillomatosis improved only with steroid and oxygen administration (without micro debridement). This could probably be due to the presence of superimposed croup responsible for the current worsening of the upper airway obstruction. Otherwise, we do not expect improvement of the airway obstruction just with medical treatment alone.

Acute epiglottitis was not encountered as a cause of acute upper airway obstruction in our study. This is similar to the findings of studies done in Malaysia and Singapore [23,24]. The cause for the absence of cases of epiglottitis in our study could be explained in part by the introduction of Hib vaccine to the EPI; or patients might have died of this dramatic, potentially lethal condition before they get appropriate medical care.

Peritonsillar abscess as a cause of acute upper airway obstruction was found to be rare in our study (only 1 case was found) although the incidence of bilateral peritonsillar abscess is reported to reach 4.9% in the literature [30].

The overall mortality in our study subjects was 4.3% which is less than the 11% mortality reported by Chan PW [20]. The same study [20] showed that the cause of the upper airway obstruction affected the outcome. However, we did not find any statistically significant association between the cause of the upper airway obstruction and the outcome despite the use of different statistical tests. In fact, it would be impossible to evaluate the determinants of the

outcome of acute upper airway obstruction as the size of our study population is small. Hence, further studies using large sample size should be carried out.

5.1 LIMITATIONS OF THE STUDY

Although we planned to study a sample size of 384 we managed to retrieve the hospital cards of only 161 patients who had acute upper airway obstruction in the study period. Hence, we enrolled all the patients who came with upper airway obstruction during the study period. Therefore, it is difficult to evaluate the determinants of the outcome of acute upper airway obstruction.

Lack of similar studies and standard check list formats on upper airway obstruction in Ethiopia and other countries with similar context is another limitation of this study to compare with the results of this study.

Investigator of this study was also unable to collect data for over 50 % of the predetermined sample size due to poor recording and documentation of registration books, and patient cards and Shortage of time was another constraint of this study.

6. CONCLUSION AND RECOMMENDATION

6.1 CONCLUSION

One hundred sixty one children with upper airway obstruction visited the pediatric emergency OPD during the study period. This shows at least three children with upper airway obstruction visited the emergency OPD per week during the study period. The causes of acute upper airway obstruction were varied although croup was the most common cause followed by foreign body aspiration. Laryngeal papilomatosis, bacterial tracheitis, retropharyngeal abscess, anaphylaxis, peritonsilar abscess, and blunt trauma were found to be the other causes of acute upper airway obstruction. Seven patients died of upper airway obstruction during the study period. We could not evaluate the determinants of the outcome of acute upper airway obstruction because of the small study population size.

6.2 RECOMMENDATION

Health education should be given to the public on the ways of reducing the risks of foreign body aspiration. Parents and their children should be informed about the health risks associated with the use of plastic balloons. Similarly, the policy makers in the Ministries of Health and Trade should be informed about the health risks associated with the use of these plastic balloons so that they can take measures that may include banning the imports of these plastic balloons.

Regional hospitals should be provided with materials needed to treat upper airway obstruction and staffed with professionals trained on the management of these patients so that patients will not have to travel for several hours while suffering from upper airway obstruction and risking their lives.

Practicing physicians should be given in-service training on diagnosing and prescribing appropriate treatment for the different causes of upper airway obstruction as we have seen patients incorrectly started on treatment for a wrong initial working diagnosis.

Further studies using large sample size should be carried out to evaluate the determinants of outcomes.

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8.APPENDICES

8.1 APPENDICES -1

Data collecting Format / tally sheet/ on the study of magnitude, cause and outcomes of acute upper air way obstruction among children at Tikure Anbesa Specialized Hospital.

1	MRN			
2	Age in month			
3	Gender	☐ male		☐ female
4	Residence	☐ Addis Ababa	☐ Tigray	☐ Afar
		☐ Oromia	☐ Somalia	☐ SNNP
		☐ Amhara	☐ Gambela	☐ Harare
		☐ Benshangulgumuze		☐ Diredawa
5	Origin of referral	☐ AA hospitals		☐ Regional hospitals
		☐ Private hospitals		☐ Health center
		☐ Self		☐ Private clinic
6	Clinical presentation to ED	☐ Choking/SOB & cough		☐ Choking/hoarseness /barking cough
		☐ Muffled voice & difficulty swallowing		☐ Urticarial/facial swelling/ wheezing
		☐ Cough/Vomiting		☐ Strider & barking cough
		☐ fever		☐ SOB
		☐ Soerthroat /neck pain		☐ Other Specify _____

7	Confirmed Diagnosis	☐ Croup	☐ Infectious mononucleosis
		☐ Epiglottitis	☐ Esophageal foreign body
		☐ Bacterial tracheatis	☐ Foreign body Aspiration
		☐ Retropharyngeal abscess	☐ Type of foreign body Aspirated
		☐ Peritonsilar abscess	☐ ----------
		☐ Anaphylaxis	☐ Penetrating Trauma
		☐ Burn injuries	☐ Trauma blunt
		☐ Other Cause	
		☐ Specify_____	☐
8	Co morbidity	☐ Yes	☐ No
		If yes	
		☐ Pneumonia mid/moderate	☐ Lower airway obstruction
		☐ Severe pneumonia	☐ COPD
		☐ HIV/AIDS	
		☐ Other specify _____	

9	Elapsed Time after the obstruction occurred & reached to ED in hours'		
10	Disposition	☐ Kept in back for Observation then Discharged	☐ Admitted to PICU
		☐ Admitted to Ward	☐ Referred to other Hospital
11	Measure Taken	☐	☐
		☐	☐
		☐	☐
12	IF Bronchoscopey done site of FB found	☐ Upper part of Trachea	☐ Left main Bronchus
		☐ Right main Bronchus	☐ At Carina
13	Out come after management in ED	☐ Cured	☐ Improved
		☐ Dead	☐

APPENDICES-2

Table 1: Socio-demographic characteristics of the study subjects (n=161)

	Frequency	Percent
Sex		
Male	109	67.7%
Female	52	32.3%
Address		
Addis Ababa	127	79%
Regional States	34	21%
Age group		
<12 months	32	19.9%
12-59 months	109	67.7%
>59 months	20	12.4%

APPENDICES-3

Table:2 Types of Foreign Body Aspirated (n=16)

Types of Foreign Body	Frequency	Percent
Tip of a plastic balloon	4	25%
Peanut	2	12.5%
Maize	2	12.5%
Piece of a metal	2	12.5%
Piece of bread	2	12.5%
Fragment of a bone	1	6.25%
Fragment of a stone	1	6.25%
Chewing gum	1	6.25%
Disc battery	1	6.25%

APPENDICES-4

Table 3: Profile of patients who died of upper airway obstruction.

No	Age (month)	Sex	Address /Region	Diagnosis	Duration of illness	Co morbidity	Treatment
1	21	Male	A.A	Bacterial tracheitis	78 hrs	Pneumonia	Antibiotic, mechanical ventilation
2	44	Male	Tigray	Laryngeal papillomatosis	22 hrs		Steroid, nebulized epinephrine
3	96	Male	SPNN	Peritonsillar abscess	18 hrs		CPR
4	21	Female	A.A	Croup	36 hrs	Pneumonia	CPR
5	17	Female	A.A	Croup	44 hrs		Steroid, nebulized epinephrine
6	114	Male	Oromiya	Retropharyngeal abscess	168 hrs		Antibiotic, O2
7	24	Male	A.A	Laryngeal papillomatosis	8 hrs		CPR

APPENDICES -5

ASSURANCE FORM

I, the under signed ,assert that this MSC thesis is my original work, has not been presented for A degree in any other University and that all sources of materials used for the thesis have been Accordingly acknowledged.

M.S.C. candidate ; Getachew Metaferia Endezenaw (BSC)

Signiture_____Date_____

Advisor

Muluwork Tefera(MD, Assistant professor of pediatrics)

Signiture _____Date_____