

Original Article / Orijinal Makale**AN ANALYSIS OF FOREIGN BODY ASPIRATIONS IN TURKEY****TÜRKİYE'DE YABANCI CİSİM ASPİRASYONLARININ ANALİZİ**Atilla Şenaylı¹, Yeşim Şenaylı²**Özet**

Amaç: Ülkemizde yabancı cisim aspirasyonlarının incelenerek toplam durumun ortaya konulması ve konu ile ilgili bir görüş oluşturulması amaçlanmıştır.

Materyal ve Metod: Türkçe ve İngilizce literature verileri incelenmiştir. Değerlendirme sırasında verinin tekrarlama ihtimalinin bulunması nedeni ile sadece retrospektif makaleler incelemeye alınmıştır ve tanısal korelasyon, vaka sunumu ve prospektif klinik incelemeler dahil edilmemiştir. Makalede zaman dönemleri ve bölgeler tanımlanmıştır. Yaş, cinsiyet, yabancı cisim tipleri, negative eksplorasyonlar ve komplikasyonlar değerlendirilmiştir. Komplikasyonlar, yabancı cisim aspirasyonlarının insanlar üzerindeki zararlı etkilerini göstermek için tartışılmıştır. Ekonomik etkileri, kabaca yapılan finansal değerlendirme ile incelenmiştir.

Sonuçlar: Kritere uyan 14 makale seçilmiştir.1973 yılından 2007 yılına kadar 6633 hasta yabancı cisim aspirasyonu nedeni ile tedavi edilmiştir ve yabancı cisim 5014 hastada bulunmuştur. Erkek ve kız hastalar, sırasıyla, 3343 ve 2379 (E/K oranı yaklaşık 1.40) kişiydi. Ortanca yaş 64.57 aydı. Başarısız bronkoskopilerde toplam 46 torakotomi yapılmıştı. Ayrıca, 9 trakeotomi, 4 pnömotoraks ve 7 kardiyak arrest rapor edilmiştir. En çok görülen yabancı cisimler çekirdek ve iğne idi. Prosedürlerin toplam maliyeti kabaca yapılan hesaplamada 2.006.000, 00 TL (yaklaşık 1.330.000, 00 USD) idi.

Sonuç: Tüm parametreler uluslararası verilerle uyuşmakta idi. Yaklaşık olarak 40.000 USD yıllık bazda masraf oluşmakta idi. Uluslar arası veri ile korelasyon olduğu gösterilse de, inanıyoruz ki yayınlanan hasta sayısı beklenildiği kadar yüksek bulunmamıştır. Buna rağmen, çalışmamız ülkemizin verilerini bir araya getiren ilk çalışmadır ve ülkemizdeki yabancı cisim aspirasyonlarının karakteri ortaya konulmuştur

Anahtar Kelimeler: Foreign body aspiration; yabancı cisim aspirasyonu(*Turkish*);

Abstract

Objective: We analyze the foreign body aspiration reports of our country to demonstrate a cumulative result and to form the aspect of issue.

Material and Method: Turkish and English literature data were evaluated for the study. During evaluations, as there was a possibility of repeating data, we only took retrospective reports and we did not include studies like diagnostic correlations, case reports and prospective clinical investigations. Time periods and regions were defined in the report. Age, gender, foreign body types, negative explorations and complications were also evaluated. Complications were defined to illustrate the hazardous affect of foreign body aspirations on people. For the economic influence, preliminary financial evaluation was performed.

Results: Fourteen articles match the criteria. From 1973 to 2007, 6633 patients were treated for foreign body aspirations and foreign bodies were found in 5014 patients. Male and females were 3343 and 2379 (M/F ratio was approximately 1.40) respectively. The median age for patients was 64.57 months. Total 46 thoracotomies were performed for failed bronchoscopies. Additionally, 9 tracheotomies, 4 pneumothorax and 7 cardiac arrests were reported. Most seen foreign bodies were seed and needle. Total costs of these procedures were 2.006.000, 00 TL preliminarily (approximately 1.330.000, 00 USD).

Conclusion: All parameters correlate with international data. Nearly, forty thousand USD was consumed per year. Although correlation with international data was proved, we believe that number of reported patients were less than expected. Nevertheless, this is the first study complies our countries' data and we figured out the characteristics of foreign body aspiration.

Keywords: Foreign body aspiration; yabancı cisim aspirasyonu(*Turkish*); Turkey;

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INTRODUCTION

Foreign Body (FB) Aspiration is one of the important respiratory system lead to morbidity and mortality. Solid materials, liquid materials and/or gastrointestinal secretion containing these materials may be aspirated (1). Foreign body aspirations are most frequently seen in 1 to 3 years old period, and it is the most frequent mortality reason among home accidents under 1 year-old children(2).

Treatment instruments may differ according to the age. Thus, rigid bronchoscopy is the first choice in the childhood, whereas fiberoptic bronchoscope may be used in adulthood (1). For the patients with delayed treatment, morbidity and mortality may raise to 27% (2). Besides, bronchoscopy is not totally innocent and complications were seen as high as 22% (2). In the light of these literatures, being cautious and awake for the prevention from FB aspiration is seemed to be the easiest way than exhaustive and troublesome struggle against an ongoing FB aspiration.

Treatments of FB aspirations have been maintained by clinics like pediatric surgery, ear-nose-throat, cardiovascular and thorax surgery in our country. This has not only been continued by education and research hospitals but also in general hospitals. Some of them, especially education and research clinics, shared their experiences in local or international journals. However, a cumulative analysis of these data has not been performed yet and so, this is the first study collecting all these parameters for Turkey. We wanted to add a preliminary financial evaluation as an alerting component of health management, to find out the money consumed to struggle against the problem.

MATERIAL AND METHODS

Articles containing retrospective data in Turkish and English Literature concerning foreign body aspirations were identified and evaluated for data collection (3-16). Other reports like case, prospective and clinical studies were excluded to provide data against conflicts. If the reports were from the same region of the country, we focused on the list of authors in articles and if same author(s) were present, we excluded the article because of the

possibility of using their same data which may subsequently cause repeating. If different reports of the same author present on the subject, we choose the reports containing retrospective and demographic data.

In this article, our subjects are the region of the studies, number of the patients, gender, median age, foreign body types which were found during the bronchoscopies and other major complications after the bronchoscopy. Also we reported negative bronchoscopy findings. Finally, preliminary financial analysis was performed and all these findings were discussed in the light of the literature.

RESULTS

Reports containing number of patients, gender and ages are shown in Table-1. Periods of the reports, negative bronchoscopy evaluations according to the total bronchoscopy and most seen foreign bodies are shown in Table-2. Complication rates and most seen treatments for these complications are shown in Table-3. Financial evaluation is performed with current economical measurements. Alterations of the past financial measurements and costs are the reason the simple calculation otherwise it is impossible to maintain a standard formulation to obtain a total cost with unstable payment and prize criteria. Under this circumstance, total costs of these procedures were 2.006.000, 00 TL (Turkish Liras in current measurements equal to 1.330.000, 00 USD).

DISCUSSION

FB aspiration is an injury seen in all over the world and has to be accepted as a major problem (3). Age is an important predictor for patients and 55-75% of FB aspiration population is under 4 year- old children which is a high incidence (1). Seventy-nine to 96 % of FB aspiration population is under 10 years old (1). The rest is older than 10 year-old and also there is a peak in incidence above 50 years old (1). In our study, we found that median age of the patients was 64.57 months (5.5 years old) and this correlated the age distribution characteristics of FB aspiration revealed in the literature.

Table-1: Data of patients' distribution.

Author	Region	Year	No. Patients	Male/Female	Mean Age(months)
Demirbağ	Middle Anatolia	1995–2003	15	-	33
Kolbakır	Middle Black Sea	1986–1994	152	-	-
Çobanoğlu	East Anatolia	1995–2007	96	34/62	-
Kısacık	Middle Anatolia	1996–2003	261	125/136	116
Özpolat	Middle Anatolia	1996–2007	30	16/14	174
Tuncer	Mediterranean Anatolia	1973–2001	1802	1051/751	-
Apa	Aegean Anatolia	2004	22	16/14	24
Paşaoğlu	Middle Anatolia	1984–1990	822	537/285	-
Oğuz	Marmara Region	-	53	26/27	34±32,7
Soysal	East Anatolia	-	140	80/60	-
Çifçi	Middle Anatolia	1991–2000	663	402/261	37±1
Erikçi	Marmara Region	1997–2001	189	105/84	34±25
Yıldırım	Marmara Region	1982-1998	484	264/220	-
Eren	South East Anatolia	1990–2002	1160	687/473	-

Table-2: Bronchoscopy findings

Author	Number of patients	No. of FB / No. bronchoscopy	Most seen FB	2 nd most seen FB
Demirbağ	15	15/15	Seed	Nut
Kolbakır	152	143/152	Bean	Needle
Çobanoğlu	96	83/96	Needle	-
Kısacık	261	238/261	Needle	sunflower seed
Özpolat	30	22/30	Needle	Seed
Tuncer	1802	1430/1802	watermelon seed	Nut
Apa	22	17/22	Nut	-
Paşaoğlu	822	639/822	Sunflower seed	bean
Oğuz	53	22/53	Sunflower seed	peanut
Soysal	140	102/140	Sunflower seed	pins
Çifçi	663	563/663	Sunflower seed	Chick peas
Erikçi	189	127/189	pips	hazelnut
Yıldırım	484	418/484	Needle	Nut
Eren	1160	1075/1160	watermelon seed	Other seeds

Male gender was more influenced because of unclear reasons. The common accepted M/F ratio is approximately 2/1 but in different studies it varied from 1.2/1 to 1/2 (4). It was attributed to socio-cultural or regional habits that affect the aspirations. In our study, M/F distribution is 1.4 which also correlates with the literature.

As an accident, FB aspiration is the most seen reason of death in home accidents under 1 year old children (1, 4). In USA, nearly 500-1000 children die in a year because of FB aspiration (3, 14). In Turkey, ratio for death is not clear, as only few deaths after aspiration and bronchoscopy were reported. For this reason, we could not use a reliable data in this study but we thought that it was our obligation to mention about this subject. So, it can be easily seen that there is a significant discordance with USA and Turkish data. This may strongly be because of the unreported data.

Bronchoscopy is the way of treatment in FB aspiration but it may cause important complications even to death (2, 6). After bronchoscopy interventions, pneumothorax, pneumomediastinum, pneumonia, edema in airways, respiratory distress and cardiac arrest could be experienced. In spite of these risk factors, bronchoscopy which includes a possibility of negative exploration has to be performed. Twenty-five percent of negative bronchoscopies were reported in literature (5). Negative exploration incidence in our evaluation is 24.4% which correlates with the literature. To minimize the negative exploration incidence and to decrease the complications related to bronchoscopy, virtual tomography have been developed and significant comfort has been obtained for patients by this method which means protection from useless bronchoscopy (7). In spite of the many reports indicate the use of virtual tomography to reduce the number of unnecessary bronchoscopy with high sensitivity and specificity (17,18), we experienced that thorax tomography is not indication for most foreign body aspirations even in uncertain cases. We agree with *Korlacki et al* (19) that bronchoscopy is the best diagnostic and therapeutic method in all suspicions of foreign body and rigid bronchoscopy is still the method of choice in children. So we think that unneeded use of tomography exposed to the children high radiation dose instead of bronchoscopy.

Fiber optic bronchoscopy may be used but it has not had priority over rigid bronchoscopy (8). Alternatively, Fogarty catheter, snare catheter, Burrington & Cotton thorax physiotherapy and bronchodilator inhalation techniques may be used. In our study, all the procedures were performed with rigid bronchoscopy.

Aspirating organic body especially nutty substances is dangerous because these things may swell with the patients' bronchial secretions which gradually cause mechanical obstruction (6). In non-industrialized countries, most foreign body aspirations are caused by organic bodies like nuts where as plastic bodies are the most reasons of the foreign body aspirations in industrialized countries (4). In our country, there were many types of foreign bodies reported. For this reason, we found it meaningful to declare the most and the second most seen foreign bodies. Especially seed, needle were the most seen foreign body (4-7,9-12,14-16). Needle is usually aspirated during headscarf fixation. We cannot offer a suggestion for the cultural or sociological characteristic of our population according to this finding. To our knowledge, there is not an intermediate zone model present defining the population level by the type of aspirated material like ours'.

Economical consequences are the other component of the disease. We detected that 1000 to 2000 USD is consumed per patient in USA which means more money than our country spend for the FB aspiration treatments. In our country, social assurance system pays approximately 600 Turkish Liras (nearly 450 USD). The preliminary result for total economical effect is approximately 1.330.000 USD. We can easily clarify that this cost is less than USA. However, we suggest that the cost has to be more than our estimation as we predict that all FB aspiration patients were not reported in literature.

In conclusion, our retrospective findings are seemed to correlate with literature. As a difference, fortunately, deaths were very few, although it did not seem to be realistic. Additionally, we can not find the socio-economical definitions in most articles and because of this we are unable to discuss this with the literature findings. Also, as a missing part, we suppose that our data is not including all the cases in our country. Thus, we think that a lot of patients' are not reported affecting the study sensitivity and reliability. General hospital staffs are not custom to report their patients' record and this may be the reason. The low number of mortality in most series may be attributed to that most of the mortality occurred before broncoscopic intervention which even not arrived medical center. So many cases could not be recorded. Nevertheless, to our knowledge, this is the first report collecting the reported data from all of the regions of our country. We not only believe that this report may figure out Turkish characteristics for foreign body aspiration but also may provoke these types of analysis of the other diseases for Turkey.

Table-3: Complications seen after bronchoscopies

Author	Complication rates	Most seen complication
Demirbağ	3/15	Cardiac arrest with pneumothorax
Kolbakır	-	-
Çobanoğlu	5/96	Thoractomy
Kıscık	10/291	Thoractomy
Özpolat	1/30	Thoractomy
Tuncer	9/1802	Tracheotomy
Apa	-	-
Paşaoğlu	4/822, 4/822	pneumothorax, reversible cardiac arrest
Oğuz	1/53	Thoractomy
Soysal	3/140	Thoractomy
Çifçi	21/663	-
Erikçi	-	-
Yıldırım	12/484	Thoractomy
Eren	14/1160	Thoractomy

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