Bronchoscopy in lipoid pneumonia

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Abstract

Forcible administration of rendered animal fat to infants is a tradition in south western Saudi Arabia. Accidental inhalation may result in a resistant form of lipoid pneumonia. A series of 24 cases of lipoid pneumonia, 22 of which were diagnosed by bronchoscopy with bronchial lavage and microscopic examination of the aspirate, are reported. The technique is described briefly and the results analysed. A high index of suspicion together with bronchoscopy and bronchial lavage of all cases of resistant or recurrent pneumonia is essential in areas such as ours for diagnosis of this condition.

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Since the first clinical report of lipoid pneumonia in 1925,¹ numerous cases have been reported in the world literature with a peak of reporting in the 1940s.²⁻³ With an increasing realisation of the deleterious effects of inhaled oil and the subsequent elimination of oily medication and nasal drops, there has been a dramatic decline in the occurrence of these cases.

In certain geographical areas, however, traditional customs and habits may predispose to the condition.⁴⁻⁶ In the Tihamat Asir region of south western Saudi Arabia, rendered animal fat or ghee, called 'saman', is administered forcibly to neonates and infants by an elderly relative in the belief that it contributes to the well being of the child. Accidental inhalation of this animal fat with resulting lipoid pneumonia is consequently very common in this area. This paper highlights the role of bronchoscopy in the diagnosis and treatment of these cases.

Patients and methods

Children with resistant or recurrent pneumonia presenting over a three year period to Asir Central Hospital, the only tertiary care facility in the region, were studied. All the children were referred to the otolaryngologist by paediatricians. A detailed history including history of feeding of saman was obtained in each case. A chest radiograph was performed before bronchoscopy.

Bronchoscopy was carried out by using a Storz ventilating paediatric bronchoscope of the appropriate size. Any secretion in the trachea or bronchi was aspirated using a sterile suction connected to a 'mucus trap'. When secretions were scanty, bronchial lavage was carried out by instilling 1-2 ml of sterile normal saline into the tracheobronchial tree and aspirating the contents

after ventilating a few times. The aspirate was viewed macroscopically against a bright light and any oily droplets floating on the surface were noted. The aspirate was subjected to microbiological studies, including Gram and Ziehl-Neelsen staining, appropriate bacterial and fungal cultures, and special stain for fat (oil red O). The gross bronchoscopic findings such as the state of the mucus membrane, the presence or absence of secretions, their nature, and presence of any other endobronchial pathology were noted. Chest radiographs were repeated within 24 hours of performing the bronchoscopy. The condition of the patient at follow up, particularly at one month after bronchoscopy, was also noted. All data were entered into a SPSS/PC computer program for analysis.

Results

Out of a total of 115 pediatric bronchoscopies performed in Asir Central Hospital over a three year period, foreign bodies were found in 37 cases, recurrent or non-resolving pneumonias in 43 cases, and various forms of airway obstruction in 35 cases. Twenty out of the 43 cases (47%) of resistant or recurrent pneumonia and two out of 35 cases (6%) of airway obstruction tested positive for lipid by the method outlined above. None of the children with a foreign body tested positive. Two of our first cases were diagnosed by open lung biopsy because of our relative inexperience initially with the diagnostic techniques in lipoid pneumonia. Our series, therefore, had 24 cases of microscopically or histologically confirmed cases of lipoid in the tracheobronchial tree, making it one of the largest reported series of lipoid pneumonia.

Our patients had a median age of 9.5 months with a range of 1-132 months. Both sexes were similarly represented and all excepting one child were Saudis. The main clinical presentation is summarised in the table, and a representative chest radiograph is shown in the figure.

The reliability of history in the diagnosis of

Clinical features in 24 children with lipoid pneumonia

Feature	No (%)
Symptom:	
Fever	15 (63)
Cough	17 (71)
Failure to thrive	2 (8)
Recurrent 'chest infections'	6 (25)
Signs:	
Respiratory distress	8 (33)
Cyanosis	2 (8)
Rales	10 (42)

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Chest radiograph of a patient with lipoid pneumonia showing extensive consolidation of the right lung.

lipoid pneumonia was assessed in our series. A positive history of ghee administration was obtained in 21 of 24 (88%) cases. In six of these only repeated questioning produced this history. The remaining three patients with an uncertain history of ghee ingestion were severely handicapped children with cerebral palsy and feeding problems. In these cases milk aspiration as a cause of lipoid pneumonia could not be excluded with certainty.

Bronchoscopy in these children with lipoid pneumonia was not accompanied by any morbidity or mortality in our series. The chest radiograph taken 24 hours after bronchoscopy showed improvement in 19 cases, no change in three cases, and deterioration in none. However, this improvement was not sustained at one month after bronchoscopy as all patients needed further therapeutic measures such as corticosteroids. Thus bronchoscopy was less efficient as a therapeutic method than as a diagnostic tool as therapeutic benefits were not sustained over a period of time.

Discussion

Diagnosis of lipoid pneumonia has always posed challenges to the clinician. In earlier reports, diagnosis was often postmortem.⁷ Some authors have found chest radiographs to be diagnostically useful.⁵ However, we have not been able to demonstrate any distinct radiological patterns.⁶ Although computed tomography has been advocated in the diagnosis,⁸ patients with minimal and diffuse infiltration or with extensive

fibrosis may not reveal the typical computed tomography densities of lipid. Fine needle aspiration and open lung biopsy seem to have also been advocated as diagnostic methods in lipoid pneumonia.⁵ Apart from being invasive, the technique has the added disadvantage of being sometimes difficult to perform due to the inaccessibility of the lesion. Bronchoscopy with bronchial lavage has been previously employed and lipoid material demonstrated within macrophages and lying free in the aspirate.⁵ We have at times observed lipoid material floating on the surface of the bronchial lavage even when examined by the naked eye. Bronchoscopy also gives the physician an opportunity to rule out other causes of recurrent bronchopneumonia such as neglected foreign bodies. The authors have preferred the use of a rigid ventilating bronchoscope, although a flexible bronchoscope may also be used for this purpose.

In centres where lipoid pneumonia is uncommon, it becomes important to establish the precise nature of the lipid by detailed chemical analysis to establish its source. However, in Saudi Arabia, where traditional practices account for the vast majority of the cases, such analysis is perhaps superfluous and not cost effective as the exact nature of the aspirated lipid is already known.

In areas where lipoid pneumonia is common, a high index of suspicion combined with bronchoscopy and bronchial lavage and staining of the aspirate for lipid seems to be a reliable and minimally invasive method for diagnosing the condition. If the bronchoscopy is inconclusive, other diagnostic methods may be needed. In children of 3 years of age and older, trans-bronchial biopsy may be helpful for establishing the diagnosis. We believe that open lung biopsy should be reserved for those few cases where the preceding less invasive methods are unhelpful.

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