

Lipid Aspiration Pneumonia Due to Fat Ingestion in Yemeni Infants

**AYMAN A. HASSAN, M.D.
and LUTFI M. EL-SAYED, M.D.**

*The Departments of Pediatrics, Faculties of Medicine,
Cairo and Zagazig Universities.*

616.24-003.6-0532

Abstract

We conducted a study of the occurrence of lipoid aspiration pneumonia in young infants in a rural population of Northern Yemen, complicating the practice of feeding young infants with "Ghee", in the hope of making them grow fatter. We performed a review of cases encountered during a 15 month period and we analyzed the clinical findings, age and sex incidence, as well as outcome. We also discuss the radiological appearances and their evolution with time. A total of 71 cases were encountered during the period of the study (November, 1992 to January, 1994), with an average of 4-5 new cases a month. Male and female incidences were 45% and 55%, respectively. 40% of the infants were less than 15 days of age and 60% were between 15 days and 3 months. All presented with respiratory distress, usually very severe. 80% were also refusing to suck and 50% were febrile. We recognized a group who were previously healthy but low birth weight and another group who had a background of neonatal sepsis. Duration of hospital stay ranged from 2-45 days. Addition of corticosteroids had a beneficial effect on the speed of improvement. 75% recovered, with a case fatality rate of 25%. Deaths occurred due to respiratory failure. Some related socio-economic issues are also addressed.

Introduction

IN addition to the morbidity and mortality due to infectious disease e.g. gastroenteritis and dehydration, bronchopneumonia, meningitis and the effects of malnutrition, infants and children in developing countries also suffer from a variety of problems related to faulty traditional beliefs and customs, lack of education of the parents and environmental hazards. We present a problem encountered among infants in Yemen, in which parents force-feed their young infants one or several mouthfuls of "Ghee"

or oil, in the belief that it would make them fatter and therefore, healthier. The results are often disastrous: babies present with choking, severe respiratory distress, and a severe form of pneumonia (lipoid pneumonia), which is often fatal. The following case histories illustrate the clinical picture, course and outcome.

Case Histories

Case 1: A 15 days old female infant, weighing 1700 gm, presented with lethargy, respiratory distress, pallor and poor feeding. On examination the baby is weak,

lethargic, pale and obviously severely malnourished. Rectal temp. is 37.2. She had signs of severe respiratory distress, including tachypnea, retractions, working alae nasi and grunting. The heart is free. The chest showed decreased air entry on the right side, with bilateral crepitations. The baby was admitted, received I.V. fluids, ampicillin, gentamicin, oxygen, aminophylline and dexamethasone. Chest X-rays revealed right upper, mid and lower zone homogenous opacification, with some clearing after 4 days (Figs. 1,3). Blood count showed a Hb of 8.2 gm%, Hct of 26%, WBC count of 8,400, with 36% neutrophils. Arterial Blood Gas showed p_i 7.2 pCO_2 57 PO_2 40 O_2 sat 60% HCO_3^- 14 BE-7. The latter improved to a pH of 7.4 pCO_2 28 pO_2 sat 96% HCO_3^- 23. electrolytes: Na 135 k 3. She improved clinically after a stay of 2 weeks.

Case 2: A 13 days old female infant, weighing 2100 gm, presented with dyspnea, poor feeding 3 days after she was given a meal of "Ghee". On examination, she was mildly dehydrated, with signs of severe respiratory distress, including tachypnea, retractions and marked grunting. Rectal temperature 37.8, heart examination free. Chest examination showed bilateral poor air entry and diffuse crepitations in both lung fields. Abdomen was mildly distended, no organomegaly. She was admitted, received I.V. fluids, oxygen, antibiotics and dexamethasone. Chest X-rays revealed extensive infiltrates in both lung fields, with partial clearing in the follow-up after 6 days. She improved clinically and by blood gas testing and was discharged after a stay of 18 days (Figs. 4,5).

Case 3: A 20 days old male infant weighing 1600 gm presented with cough, fever and respiratory distress. He also refused to suck and had repeated vomiting. A

history of "Ghee" intake was present. On examination he was a severely malnourished infant, moderately dehydrated, lethargic and having tachypnea, retractions, working alae nasi. He was admitted, received I.V. fluids, ampicillin, gentamicin, cefizox, dexamethasone. He developed abdominal distension and brownish vomiting. His FDP's were elevated and he received fresh frozen plasma. Blood count showed Hb 11.9% Hct 35% WBC 12.600 PI 120.000. Electrolytes: Na 141, K 5.3, Cl 119, Ca 9.4. Chest X-rays revealed bilateral increased lung markings and a hazy opacity which later progressed to a homogenous opacity of the right upper lobe. After a stay of 36 days, the clinical condition improved and the rt. upper zone opacity cleared.

Case 4: a male infant aged 25 days, weighing 2400 gm, presented with hypotonia, severe respiratory distress. He was gasping and developed cardiorespiratory arrest in the emergency room. He was resuscitated by bag and mask, cardiac massage. Afterwards he remained hypoxic, dependent upon a supply of oxygen by hood. He received I.V. fluids, antibiotics and dexamethasone. His chest X-rays revealed a right upper zone opacity, which progressed to involve much of the remainder of the right lung field. It persisted, in spite of some slow improvement of his oxygenation. He remained stable though still oxygen dependent.

Table (1): Clinical Findings.

Clinical findings	Incidence
Resp. distress	100%
Refusal of sucking	80%
Fever	50%
Cough	85%
Abdominal distension	35%
Vomiting	30%

Table (2): Age & Sex Distribution and Outcome of Cases.

Age:	% of cases
0-15 days	40%
15-30 days	35%
1-3 months	25%
Sex:	
Male	45%
Femal	55%
Outcome:	
Recovery	75%
Death	25%

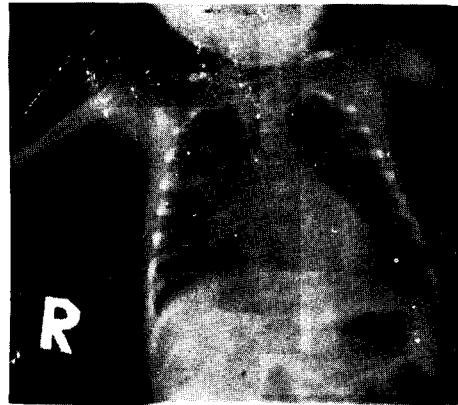


Fig. (1): Right upper, mid and lower zone opacifications.

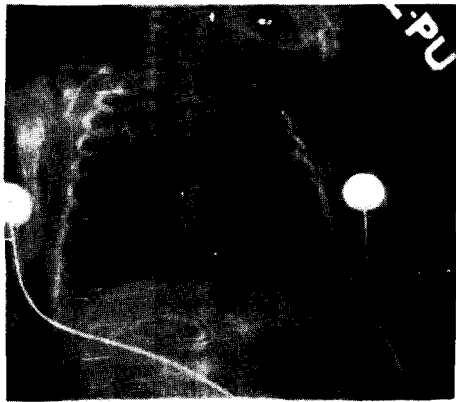


Fig. (2): Partial clearing of mid and lower zone opacities. Left mid zone opacity.

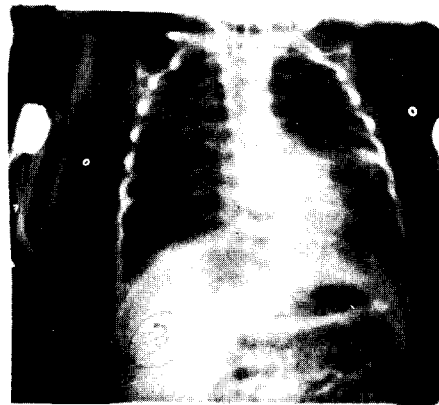


Fig. (3): More clearing of right upper zone. Increased opacity in left middle zone.

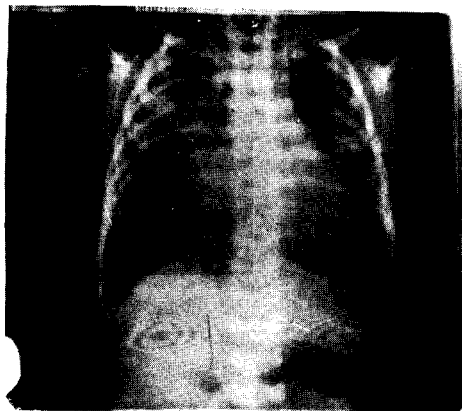


Fig. (4): Extensive infiltrates in both lung fields.

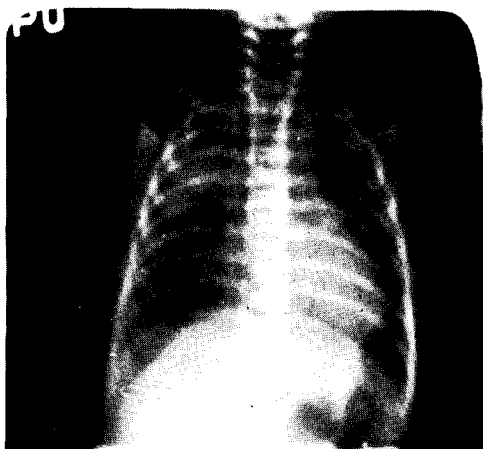


Fig. (5): Marked clearing of infiltrates after 6 days.

Discussion

The cases presented above illustrate the serious consequences of lipid aspiration in these young infants. It represents a chronic interstitial pneumonitis for which several stages are described: 1-Interstitial proliferative inflammation, with associated exudative pneumonia. 2-diffuse chronic proliferative fibrosis. 3-superimposed acute infectious bronchopneumonia. 4-a foreign body giant cell reaction, with fat-laden macrophages carried to hilar lymph nodes [1]. Comparable problems have been described due to force-feeding young infants with cod liver oil, castor oil, etc., or intranasal instillation of medicated oils. It is also comparable to aspiration pneumonia (due to milk) in infants with gastroesophageal reflux, cleft palate, poor palatopharyngeal coordination due to neurological problems or severe debilitation. While vegetable oils such as olive oil and cotton seed oil are the least irritating, producing little or no inflammation, animal oils, because of their high fatty acid content, are the most damaging. One such example would be

milk [2]. Pneumonia is severe, progressive and difficult to treat. Cases with high fever most likely represent a superadded infectious bronchopneumonia, accounting for a partial clinical response to antibiotic therapy [3]. Radiologically, the appearances are most frequently of right upper lobe infiltration, as expected due to aspiration of inhaled material in a supine infant. The inhaled material tends to shift its position, however, involving other parts of the right lung and possibly both lungs. The chemical pneumonitis, together with any superadded infectious element, also contribute to radiological deterioration. Radiological signs will often persist in the face of clinical improvement, however, they eventually disappear.

It is possible to separate two groups of infants with this disorder: a group with low birth weight but, prior to the lipid inhalation, were generally healthy e.g. cases 1,2. They are usually less than 15 days of age, in whom this practice is considered a way of boosting their weight gain. There is a very high rate of low birth weight in that part of the world [4], mainly because of maternal malnutrition, parasitism and possibly kat chewing habit. The rate is estimated at 20-31% [5]. There is also a high rate of breast feeding failure, again because of maternal malnutrition, together with delay in initiation of breast feeding and poor technique infants fail to thrive and parents resort to such practices as lipid feeding as an alternative nutritional support.

Another group of infants, e.g. case 3, are previously sick, with a picture of neonatal sepsis, their age being anywhere between 1 and 3 months. Refusal of suckling is a prominent feature of the clinical presentation, leading the parents to force the fat

into the infant's mouth. Because of extreme weakness and debility, they are unable to swallow and aspiration easily occurs. In this group, fat inhalation is only part of the picture and the outcome will depend upon the response of the sepsis to therapy.

A group of infants will have had recurrent previous episodes of aspiration, which were not sufficiently dramatic to justify a visit to the hospital. A high index of suspicion is necessary, with direct questioning of the parents.

With an Infant Mortality Rate of 130-1000 live births [4], of which acute respiratory infections account for 15% (second only to diarrheal disease) [5], lipid inhalation pneumonia accounts for up to 12% of all pediatric ward admissions and has a case fatality rate of 25%, compared to 10.4% for acute respiratory infections in general.

Health education, to avoid this hazard, would help decrease morbidity and mortality to a considerable extent. A beneficial effect of corticosteroids is detectable in

these cases, due to the important inflammatory component, which is improved with corticosteroids. This is in agreement with previous reports [2].

References

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