A forgotten old disease: mediastinal tuberculous lymphadenitis in children


Abstract

Objective: The purpose of the study was two-fold: (1) to highlight the varied presentation of mediastinal tuberculous lymphadenitis (MTL) in children and (2) to identify parameters, that may help in the early diagnosis of this condition.

Methods: Between January 1995 and December 2002, 13 children with histological diagnosis of MTL were retrospectively assessed for age at presentation, history of exposure to TB, presenting symptoms, investigations, initial diagnosis, surgical treatment and outcome. Stepwise multiple linear regression analysis was used to determine potential risk factors for early diagnosis of MTL.

Results: Thirteen children presented with: (a) fever, night sweats and weight loss (4); (b) acute respiratory distress (2); (c) cough and shortness of breath (SOB) (5); (d) stridor (1); and (e) chest pain (1). TB was suspected only in 6 children (46%) at presentation. In the other 7 cases (54%) the presumed diagnoses were: neuroblastoma (n = 1), metastatic malignancy (n = 1), bronchial polyp (n = 1), bronchogenic cyst (n = 2), and presumed foreign body (n = 2). Bronchoscopy was diagnostic in identifying cheesy material within the bronchus and organisms on lavage in 4 (30%) and in identifying external compression in 2 (15%). Thoracotomy and excision of the lymph node mass was necessary to treat the mediastinal compression and to ascertain the diagnosis of TB in 3 children (23%). All 13 children had complete resolution of tuberculous lymphadenitis following anti-tuberculous treatment. The diagnostic clues in this cohort of patients were cough and SOB with history of exposure to tuberculosis (P = 0.0001) and bronchoscopy and lavage with positive staining for acid-fast bacilli (P = 0.0001).

Conclusions: Tuberculosis was not suspected in 54% of children with MTL, and they posed diagnostic dilemma on admission. Bronchoscopy must be used as a diagnostic tool in children where tuberculosis cannot be excluded by radiology or specific skin tests. Thoracotomy and excision may be necessary to treat the obstructive symptoms.

Keywords: Tuberculosis; Surgical presentation; Mediastinal lymphadenitis; Children

1. Introduction

Mycobacterium tuberculosis infection causes latent tuberculosis (TB) in one-third of the world population. The incidence of TB in North America and Western Europe has increased over the past 10 years probably due to immigration, HIV/AIDS and the neglect of TB control programmes [1]. In the UK, the incidence of pulmonary and other forms of TB has increased from 5700 to 7000 new cases per annum (www.doh.gov.uk/tb-October 2002). Lymphadenitis is common in primary TB in children and they are asymptomatic during the non-suppurative lymphadenitis phase. The diagnosis of TB non-suppurative adenitis may be difficult due to the absence of history of exposure and lack of constitutional symptoms. The purpose of this paper is to highlight the varied presentation of an old forgotten disease, mediastinal tuberculous lymphadenitis (MTL), in children and identify diagnostic clues which may help in the early diagnosis of MTL.

2. Materials and methods

Between January 1995 and December 2002, 13 children with histological diagnosis of TB lymphadenitis were retrospectively assessed for (1) age at presentation, (2) race and sex, (3) history of exposure to TB, (4) presenting symptoms and signs, (5) investigations, (6) surgical treatment and (7) outcome. Stepwise multiple linear regression analysis was used to determine potential risk factors for early diagnosis of TB lymphadenitis.

3. Results

Six boys and 7 girls presented at mean age 3.25 years (range 2 months-12 years) with: (A) fever, night sweats
and weight loss (n=4); (B) acute respiratory distress (n=2); (C) cough and SOB (n=5); (D) stridor (n=1) and (E) chest pain (n=1). The ethnic origin of these 13 children was Caucasians (n=8), Afro-Caribbean (n=2) and Asian (n=3). Previous history of exposure to TB was present in six (46%) children (maternal TB occurred in 2) and TB was suspected at the initial presentation only in these children. Radiological imaging showed pulmonary consolidation in 3 and perihilar mass in the other 3. Mantoux test was positive in only 2 (15%) patients.

TB was not suspected in the other 7 children, and their initial diagnoses were: neuroblastoma—due to the presence of a mediastinal mass on CT scan with calcifications (n=1) (Fig. 1), metastatic malignancy due to the presence of pulmonary ‘cannon ball’ lesions and abdominal para-aortic lymphadenopathy on CT scan (n=1) (Fig. 2), bronchial polyp with left upper lobe consolidation (n=1) (Fig. 3), bronchogenic cyst due to the presence of a cystic mediastinal mass (n=2) (Fig. 4), and acute collapse of left lung with hyperinflation of right lung due to foreign body (n=2) (Fig. 5). Bronchoscopy biopsy and/or lavage was performed in these 7 (54%) children, 2/7 cases showed external compression and in 4/7 findings of bronchoscopy were highly suggestive of TB. These 4 cases the histology and lavage culture were positive for acid-fast bacilli. Bronchoscopy was not performed in 6 (46%) cases, 2/6 were small infants with maternal history of TB, while 4/6 were already suspected to have TB. Two of these had strongly positive Mantoux test, 1 child was under treatment for suspected TB and developed ‘cannon ball’ lesions (Fig. 2) and went on to have open thoracotomy, 1 other child with mediastinal lymphadenitis had a history of exposure to TB and positive gastric washings for acid-fast bacilli. Overall bronchoscopy was diagnostic in identifying cheesy material and/or a polyp within the bronchus and organisms on lavage in 4 (30%) and in identifying external compression in 2 (15%). Thoracotomy and excision of lymph node mass was performed in 3 (23%) children to treat the mediastinal compression symptoms and to ascertain the diagnosis of TB. The mass was compressing the main pulmonary artery in 1 child and in another child the mass was compressing the trachea causing airway obstruction.

The endpoint was resolution of TB lymphadenitis, which occurred in all 13 children post anti-tuberculous treatment. There were no deaths. The possible diagnostic clues in this cohort of patients were cough and SOB with history of exposure to TB (P=0.0001) and bronchoscopy and lavage with positive staining for acid-fast bacilli (P=0.0001).
perforation of the oesophagus or the tracheo-bronchial tree, due to mechanical compression or erosion caused by the perihilar or mediastinal lymphadenopathy [7–10].

Compression of the pulmonary artery, recurrent laryngeal nerve compression causing hoarseness of voice [11] and disseminated thoracic and abdominal lymphadenopathy may also lead to suspicion of a malignant process rather than TB, as seen in 40% of our patients. The diagnostic process can further be complicated by the degeneration of the nodes with caseation and cold abscess formation with or without the formation of fistula [12]. This usually results in the occurrence of cysts, polyps, emphysematous lobes and hyperinflation from obstruction caused by the caseous material in the tracheo-bronchial tree or external compression of the trachea or the bronchi or the tracheo-bronchial tree.

CT-scan examination in patients with active disease reveals mediastinal lymph nodes over 2 cm in size with a central hypodense area corresponding to caseation necrosis and ring enhancement after contrast administration. This picture suggests a diagnosis of TB but can also present in other processes such as lymphoma, metastasis and other infections [12–15]. Cysts, calcifications and hyperinflation usually lead to a presumptive diagnosis of ‘Bronchogenic Cysts’, ‘Foreign Body Inhalation’ and ‘Malignancy’. Hence, clinicians must suspect TB lymphadenitis when presented with cough, SOB, perihilar or mediastinal lymphadenitis.

Bronchoscopy must be used as a diagnostic tool when the child presents with diverse symptoms and signs and where TB cannot be conclusively excluded by radiology or specific skin tests. Although the recovery of tuberculous bacilli remains elusive in children, the clinical awareness would help to ask for amplification studies for diagnosis from bronchial lavage [16]. The role of bronchoscopy in diagnosis of TB was thought to be controversial [17] but the risks of open thoracotomy and its associated morbidity for diagnosis outweighs the risks and possibly low yield rate of bronchoscopy. The role of bronchoscopy in diagnosing adults with MTL without pulmonary involvement was reported by Baran et al. They had noticed an endobronchial abnormality in 15 out of 17 patients [6]. They reported a 100% specificity of bronchoscopy in diagnosing MTL. In our study two children were initially suspected to have a bronchogenic cyst and one child went on to have thoracotomy, which showed lymphadenitis with caseation. In the second child we avoided thoracotomy as we suspected TB and performed bronchoscopy and bronchial lavage that confirmed TB.

Bronchoscopy should also be used as a therapeutic procedure in children with intraluminal granulomatous lesions causing acute airway obstruction and collapse of the distal lung parenchyma. Therapeutic bronchoscopy has been used successfully to open up the airways in 68% of children presenting with intraluminal granuloma with a long-term pulmonary reexpansion rate of 50% thus avoiding unnecessary surgical treatment [20].

Awareness of the occurrence of MTL could result in early diagnosis by bronchoscopy or thoracoscopy and early...
implementation of anti-TB chemotherapy. This may reduce morbidity associated with mediastinal complications, which may warrant extensive surgical intervention. Surgery for pulmonary tuberculosis has passed through various stages in history and is now been relegated to second place for treatment of this disease. However, it still remains a valid option in the background of multidrug resistance organism with localised disease in lungs and in children with MTL that produces compressive symptoms [21]. Recently, we have been performing video-assisted thoracoscopy instead of thoracotomy for achieving diagnostic biopsy and/or resection of the lesion.

5. Conclusion

We conclude that TB should be suspected in children presenting with mediastinal mass even in the absence of history of exposure to TB and negative diagnostic skin tests. Bronchoscopy and lavage should be used as one of the preoperative investigations in the management. This approach may reduce the need for surgical biopsy in difficult clinical situations. Thoracotomy may still be necessary to treat compression symptoms caused by a large lymph node mass. The specific symptoms associated with thoracic TB lymphadenitis were found to be cough and tachypnoea.

References