Mycobacterium Battey Infection Resembling Tuberculosis

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Anonymous (atypical or unclassified) mycobacteria are well established as pathogens for man (Chapman, 1960). They are able to mimic the clinical and pathological manifestations formerly attributed only to *Mycobacterium tuberculosis*. Recent Australian and American experience suggests that there is significant morbidity resulting from infection by anonymous myobacteria. Further, the amount of anonymous mycobacterial infection prevalent sometimes exceeds that of *Myco. tuberculosis* (Smyth *et al.*, 1964 ; Walker and Patron, 1964 ; Carruthers and Edwards, 1965 ; Curry, 1965). The British literature does not reflect a similar experience (Lefford *et al.*, 1966).

One of the anonymous mycobacteria, the Battey bacillus, is recognized as an important and common aetiological agent of pulmonary disease in adults and cervical lymph node disease in children (Smyth *et al.*, 1964). No documented cases of pulmonary disease in children caused by *Mycobacterium Battey* could be found. Neither were any reports found of a child with both pulmonary and lymph node disease occurring together except rare cases of disseminated fatal infection (Volini *et al.*, 1965).

This report describes the case of a child with a pulmonary lesion and cervical adenitis. The hospital admission diagnosis was tuberculosis, but comparative skin testing predicted *Myco. Battey* infection, and this organism was recovered from the lymph node.

Case Report

A boy aged 3 years 9 months presented with a six-weeks history of a lump in the right side of his neck which had been increasing in size. At the onset of his illness there were a few days when he felt feverish, but his temperature was not recorded. Before admission he had been treated with antibiotics. No other symptomatology was elicited except for some occasional tenderness of the lump in his neck. One week before admission he had been seen at another hospital where a Heaf test was found to be strongly positive.

The child had been admitted to our hospital two years previously for investigation of idiopathic convulsions. At that time a Heaf test was recorded as negative. In the year before admission he had had no further convulsions and had been on no anticonvulsant therapy. There was no family history of tuberculosis or any known tuberculous contacts. The family was of West Indian extraction, but had been in Britain for nine years and the patient was born at a local hospital. He had not been given B.C.G. vaccine.

Physical examination showed him to be an apparently fit and alert negro boy at the 50th percentile by height and the 30th percentile by weight for age. A mass protruding from the right side of his neck seemed to involve the submandibular as well as the upper anterior cervical lymph nodes (Fig. 1). The mass was hard, with slight tenderness, and was not fluctuant or warm. It measured 1 by 1½ in. (2.5 by 3.8 cm.) and we could not be sure whether it was a single node or a bunch of smaller nodes matted together. The presence of a 4+ Heaf test on his arm was confirmed. The rest of the physical examination was within normal limits. Temperature on admission was 98.6° F. (37° C.).

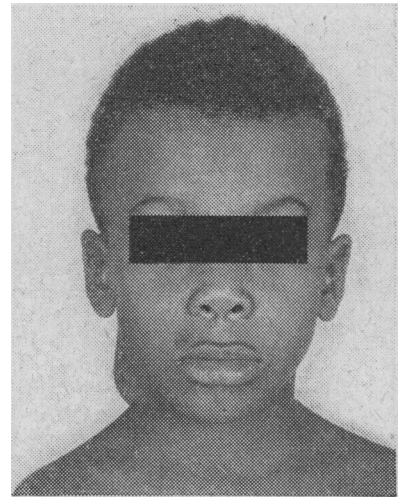
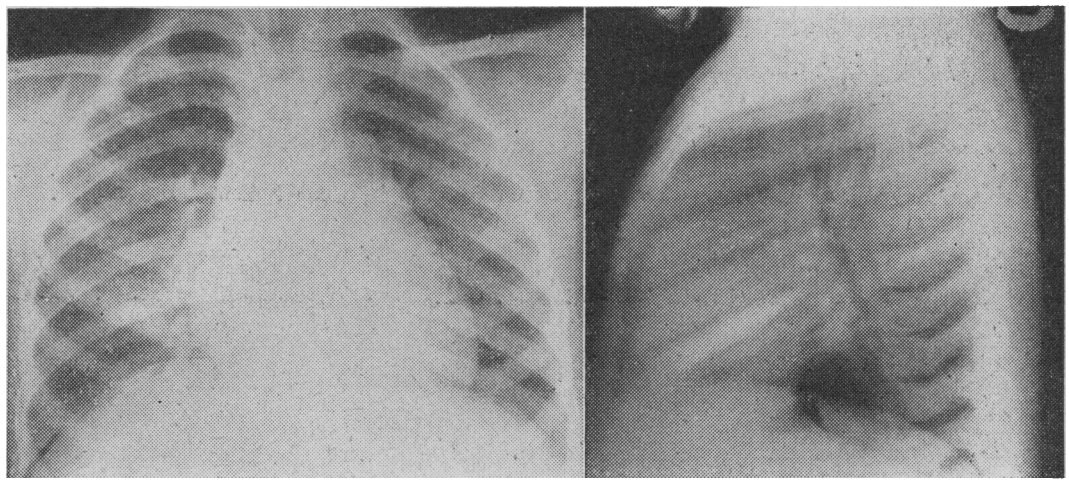


FIG. 1.—Photograph of patient, showing mass in neck.

Chest *x*-ray examination showed an opacity in the medial segment of the right middle lobe (Figs. 2 and 3). The sedimentation rate was 37 mm. in the first hour (Westergren) ; haemoglobin 11.9 g./100 ml. ; white blood cell count 10,600/cu. mm., with a differential count of 44% neutrophils, 8% eosinophils, 42% lymphocytes, and 6% monocytes. Sickling test and Paul–Bunnell screening test were negative. Urine analysis was normal. Serum Na, K, Cl, urea, Ca, and P were normal. Cultures of nose, throat, and rectum showed normal flora.



FIGS. 2 and 3.—*X*-ray films showing opacity in right middle lobe.

At admission a presumptive diagnosis of tuberculosis was made on the basis of a strongly positive Heaf test in a child under 4 years of age, a recent skin-test conversion, a lesion in the chest, an enlarged "cold" cervical node, and a raised sedimentation rate. Comparative skin testing by the Mantoux technique was performed with purified protein derivative (P.P.D.)-tuberculosis (human),

P.P.D.-avian, and P.P.D.-Battey. Three gastric washings were done and the child was given penicillin as a therapeutic trial.

After two weeks of penicillin therapy he remained asymptomatic but had occasional episodes of low-grade fever with no change in his chest lesion or sedimentation rate. His node became fluctuant, and incision with drainage, under cover of isoniazid (20 mg./kg./day) and P.A.S. (300 mg./kg./day), was performed. His tonsils and adenoids were removed simultaneously in order to search for a possible focus of infection.

After surgery, treatment was continued with isoniazid and P.A.S. His node decreased markedly in size with no further drainage after the first month. By the end of three months his sedimentation rate had returned to normal and his chest *x*-ray film had cleared. Six months after onset of therapy he remained well with no evidence of persistence or recurrence.

Bacteriology and Pathology

The skin test antigens (P.P.D.) used for all the Mantoux testing were supplied by the Central Veterinary Laboratory, Weybridge. The human antigen was prepared from strains C, D.T., and P.N. obtained from children with *Myco. tuberculosis* infections. The Battey antigen was prepared from an American strain 100616. The avian antigen was prepared from strain D4 isolated from infected domesticated poultry. All three strains were supplied as containing 2 mg. (100,000 units) per ml. Previous to skin testing the material was freshly diluted to deliver 0.00001 mg. (0.5 unit) per dose. Comparative Mantoux skin testing was done on two separate occasions. The first test compared the avian with the human antigen. Both were positive (greater than 5 mm. induration), but the avian reaction was twice as large as the human. The second test compared Battey, avian, and human antigens placed simultaneously. The Battey showed 15 mm., the avian 12 mm., and the human 6 mm. of induration.

Pus from the node was sent to three separate laboratories. Identification of the organism was arrived at independently by two of these laboratories. The other could not distinguish it from *Myco. tuberculosis*. The pus was negative by Gram and P.A.S. stains but showed acid-fast organisms by Ziehl–Neelsen stain. Bacterial and fungal cultures were sterile, but acid- and alcohol-fast bacilli were grown on Löwenstein–Jensen slope after six weeks' incubation. These were subsequently identified as non-photochromogens of the Battey type belonging to Runyon group III. Sensitivities were done with the use of standard strains as comparison and resistance ratios were obtained. These showed the organism to be sensitive to cycloserine but resistant to streptomycin, viomycin, P.A.S., isoniazid, ethionamide, and thiosemicarbazone. (We can only note that the clinical response as reported was at variance with these in vitro sensitivity tests.)

Histology of tonsils and granulation tissue from the node showed miliary "tubercles" with macrophages, lymphocytes, and multinucleate giant cells with early caseation.

Gastric washings were negative for acid-fast organisms and showed no growth on culture.

Discussion

The role of *Myco. Battey* infection among children in Great Britain is not clear. Marks (1964) mentions four cases of cervical adenitis in children caused by *Myco. avium*. This organism, in his classification, is probably closely related to or synonymous with *Myco. Battey* (*Lancet*, 1962). Marsden and Hyde (1962), in their review of cervical adenitis among children caused by anonymous mycobacteria, did not identify the Battey bacillus in any of their cases.

Skin testing has been done only on a limited scale and generally by the Heaf technique, which provides a poor guide to the degree of tuberculin sensitivity (Griffith *et al.*, 1963). Yet the Battey purified protein derivative has been shown to be an excellent case-finding tool and diagnostic adjunct (Palmer *et al.*, 1959). In addition, it has been suggested that it can be utilized as a screening tool for all anonymous mycobacterial infections as it shows extensive cross-reactions to other mycobacteria (Walker and Patron, 1964).

The issue is further clouded by gross variation in standards of tuberculosis bacteriology. Laboratories very often fail to distinguish between tubercle bacilli and anonymous mycobacteria (Marks, 1965). Yet the therapeutic problem created by these organisms is as great as that due to primary resistance of tubercle bacilli because of their generally poor response to chemotherapy (Lefford *et al.*, 1966).

As a result, we find it difficult to accept that *Myco. Battey* infection, especially among children, is virtually absent from Great Britain. To do so might lead to diagnostic, epidemiological, and therapeutic error (Smith *et al.*, 1965).

Addendum.—We refer readers to two articles which appeared after submission of this paper and which present evidence for differential Mantoux-testing in children (Keay and Edmond, 1966; Mackellar *et al.*, 1967).

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