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Concomitant *Mycobacterium avium* Infection and Hodgkin's Disease in a Lymph Node from an HIV-negative Child

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Abstract We report a case of an immunocompetent child with simultaneously an infection with *Mycobacterium avium* and Hodgkin's disease in a cervical lymph node. A positive PCR result for *M. avium* on a biopsy of the lymph node directed the definitive diagnosis for both etiologies and avoided a possible dissemination of this infection after chemotherapy was started.

Keywords *Mycobacterium avium* · Hodgkin's disease · PCR

Introduction

Cervical lymph nodes are frequent sites for mycobacterial infection as well as for Hodgkin's disease (HD) [1, 2]. Since the clinical presentation of both diseases may be similar, the differential diagnosis is difficult [3, 4]. Here we report a case of an immunocompetent child with simultaneously an infection with *Mycobacterium avium* and HD in a cervical lymph node. The *M. avium* infection was detected before chemotherapy was initiated preventing a miliary dissemination of the disease.

Case Report

A 13-year-old female was admitted for a supraclavicular mass of 3 weeks of evolution to a regional hospital. A biopsy was taken and the presumed diagnosis was cat scratch disease. The mass reduced its size after the administration of ciprofloxacin and amikacin for 2 weeks. However, after treatment was stopped, the lymph node increased in size again. Another biopsy was taken and the exam revealed a granulomatous lymphadenitis, negative for acid fast bacilli (AFB). The patient was referred to the Institute of Tropical Medicine Pedro Kourí (IPK). On admission, the physical examination of the child was remarkable only for the large (2×3-cm), firm, polycyclic and painless supraclavicular mass. The routine blood, coagulation and serum biochemistry studies were within normal limits, the HIV test was negative and no evidence of other impaired immune function was detected. The tuberculin PPD test was negative but the chest X-ray showed an enlargement of the upper mediastinum, while the upper abdominal ultrasound study was negative for enlarged lymph nodes. Ziehl-Neelsen stains of three serial direct sputum samples and culture for mycobacteria were negative. The material obtained by fine needle aspirate (FNA) from the supraclavicular mass resulted negative for AFB and no mycobacteria were grown from it. However, evidence of a mycobacterial infection was found when the

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439 bp region of the 65 kDa heat shock protein (*hsp*) gene was amplified from this aspirate using protocols described elsewhere [5]. Another biopsy was taken and sent for a routine histopathology study and for mycobacterial isolation to the "National Reference Laboratory of Tuberculosis and other Mycobacteria" (NRLTM). The biopsy revealed Hodgkin´s disease of the mixed cellular type and *M. avium* DNA was amplified with a nested PCR for the 133 bp region of the 65 kDa heat shock protein followed by restriction enzyme digestion using primers and conditions described by Cook and co-workers [6]. Six weeks later, isolation of *M. avium* was reported by the NRLTM. Treatment with rifampicin, ethambutol and azithromycin for 6 months was initiated 15 days previous to radiotherapy and two cycles of chemotherapy with vincristine, adriamycin and etopophos without prednisone. Two years after finishing the treatment the patient has a complete resolution of the malignant disease and is considered cured for the *M. avium* infection.

This is the first time that, simultaneously, a mycobacterial infection and HD has been diagnosed in a lymph node from an immunocompetent patient. There is only one other article, reporting concomitant *Mycobacterium avium* complex infection and Epstein-Barr virus associated Hodgkin's from a patient with AIDS [7]. The diagnosis of mycobacterial infections represents a difficult task in the clinical practice. This is especially true for nontuberculous mycobacterial infections (NTM) which usually lack specific clinical symptoms and defined morphological features [8]. The most common species related to cervical lymphadenitis in children (80% of culture-positive cases) is *M. avium*, which is present in natural waters, swimming pools, and drinking-water systems [1, 9]. Epidemiological data contributed by the parents of the child, showed the she was living in an old and humid house and that she regularly went out for swimming in water reservoir, risk factors for contracting mycobacterial infection specially a *M. avium* infection [10]. Interestingly, the patient was diagnosed in a 3 months period with cat scratch disease, then with granulomatous lymphadenitis and finally HD. This sequence of events may be interpreted as the NTM infection of the cervical lymph nodes following the infiltration by the lymphoma. The co-infection with *M. avium* was detected only because PCR showed the amplification of a DNA fragment specific for mycobacterial infection.

In summary, careful histological examination is still of the utmost importance for the diagnosis of proliferative and infectious disorders. In addition, molecular detection of infectious agents is additional valuable tools for a fast and specific diagnosis. As demonstrated here the simultaneous occurrence of *M. avium* infection and HD in this HIV-negative child probably would not have been diagnosed without the application of PCR and thus avoided a possible dissemination of this infection after chemotherapy was started.

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