Emergence of Pleomorphic in pathogenic bacteria (*Mycobacterium tuberculosis*)

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Abstract

*Mycobacterium tuberculosis* still remains a substantial global threat due to ill defined mechanisms that enable this organism to persist and replicate. Although molecular methods have revolutionized the diagnostic techniques in tuberculosis, yet a conventional simple microscopy remains the most cheap, easy and simple method for its diagnosis. The only requirement for the same is a trained eye to identify different pleomorphic forms of acid fast bacilli from the clinical specimen. We present here a case report of tubercular lumbar abscess with an unusual morphology.

Keywords: *Mycobacterium tuberculosis*, morphology, microscopy

INTRODUCTION

*Mycobacterium tuberculosis*, the agent of human tuberculosis, has been estimated to have infected one third of world population with 3 million deaths per year (Monteiro et al., 2003). The delay in making a correct diagnosis and identification are major difficulties that increase the problem of this disease.

*M. tuberculosis* generally gives distinctive colony morphology when grown on solid media but difficulty arises when only microscopy is available. This organism exhibits extreme pleomorphism in certain circumstances and can exist even as cell wall deficient or L- forms (Domingue and Woody, 1995). These L forms predominate and are crucial to survival of mycobacteria, whose cell wall deficient forms escape destruction by host defense system (Ratnam and Chandersekhar, 1976). We present here an unusual morphology of *M. tuberculosis* in direct microscopy smear which created an initial diagnostic dilemma between *M. tuberculosis* and *Nocardia*.

CASE REPORT

A 56 year old male presented to medical OPD with complaint of swelling in the right lumber region for the past 15 days. Patient also complained of nausea and decreased appetite since one month. Patient was a known case of type II diabetes mellitus for which he was on regular medication. He also gave history of hospitalization two years back for right lower zone pneumonitis.

On examination the patient was afebrile and appeared pale and debilitated. Pulse rate was 100/min and boiling point was 100/70 mmHg. Chest auscultation revealed bilateral crepitation throughout the lung fields. Abdominal examination revealed a soft non tender mass in right lumbar region which was soft, 4 × 2 cm in size. X-ray lumbar spine and MRI lumbosacral region was performed which revealed left sided para spinal and gluteal abscesses extending from L4 down to S3 level with involvement of posterior spinal elements also. X-ray chest revealed a small cavity in the left upper zone with haziness in right lower zone. Left CP angle was clear. Bony thorax, heart and mediastinum appeared normal. FNAC was performed on the lumber areas and the pus sample was sent to Microbiology department for culture and microscopy. Three consecutive sputum samples were also sent due to past history of pneumonitis and a strong suspicion of tuberculosis. Laboratory investigation showed hemoglobin (Hb) 9.1 gm/dl, Total leukocyte count (TLC) of 23.7 × 10^3 /µl with DLC N40, L56, M2 and E2, (Lymphocytosis) LFT were normal and ELISA for HIV was non reactive. IgG ELISA performed on patients serum for tuberculosis was strongly positive. Sputum was negative for acid fast bacilli by ZN stain and bacterial culture revealed normal flora. Pus sample from lumbar abscess revealed numerous beaded acid fast bacilli resembling *M. tuberculosis* with...
We did not have the benefit of all these identification features because of lack of culture facility. Thus the relevance of this case report lies in its diagnosis based only on microscopy and also with pleomorphic morphology. The morphological diversity within mycobacteria could also be due to heterogeneous environments in the different body site of patient/host (natural conditions). Moreover, *M. tuberculosis* is known to exhibit extreme pleomorphism in certain circumstances like existing as cell wall deficient form or L-forms (without rigid cell wall) (Michailova et al., 2005). The prevalence with L- form transformation state is that of drug resistance to several antimicrobial agents.

Thus we conclude that the morphological diversity of *Mycobacterium* still needs to be analyzed in depth and basic microbiology laboratory plays a pivotal role in control of Tb through rapid presumptive identification (Monteiro et al., 2003). Strong clinical suspicion requirement to treat a patient of tuberculosis. This method could be used at regional laboratories to report or tentative identification before sending the culture to a reference centre for confirmation.

**REFERENCES**


