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Immunohistochemical findings of the granulomatous reaction associated with tuberculosis

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ABSTRACT

Objective/background: The histological diagnosis of *Mycobacterium tuberculosis* (MTB) has long been a diagnostic challenge in the anatomical pathology field despite availability of different laboratory methods. Immunohistochemistry (IHC) could not only confirm granulomatous tissue involvement but also demonstrate MTB antigen immunolocalization. This study tries to clarify the details of IHC staining for MTB with pAbBCG.

Methods: A total of 50 patients undergoing simultaneous biopsy and tissue culture with positive tissue culture for MTB during 2005–2009 were selected from the MRC Department at Masih Daneshvari Hospital, Tehran, Iran. Using the archives of the Pathology Department of this hospital, which is a referral center for pathological lung lesions, hematoxylin and eosin slides of the selected patients were evaluated. Twenty-three confirmed TB granulomatous tissue samples with adequate tissue and number of granulomas were chosen and studied by Ziehl–Neelsen and IHC staining with pAbBCG.

Results: A total of 23 cases were evaluated, of which 17 (73.9%) were males. The types of tissue obtained from study cases were as follows: pleura (9 cases, 39.1%), lymph node (cervical, axillary, and thoracic [9 cases, 39.1%]), and lung tissues (5 cases, 21.7%). IHC staining was positive in all samples, whereas Ziehl–Neelsen staining was positive in nine cases of 23 (39.1%). IHC showed positive coarse granular cytoplasmic and round, fragmented bacillary staining. In this study, epithelioid cells clearly showed more positive staining at the periphery rather than at the center of granuloma. There is also positive staining in endothelial cells, fibroblasts, plasma cells, macrophages, and lymphocytes outside the granuloma.

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Conclusion: Detection of TB in tissue slides is still based on the histological pattern of the granuloma, which has several differential diagnoses with different treatments. Presence of mycobacterial antigens and tissue morphology can be evaluated using the IHC technique. Considering the criteria of positive IHC staining of TB granulomatous reactions, this stain not only highlights the presence of mycobacterial antigens for tissue diagnosis, but also could morphologically localize their distribution in different cells. Pathologists must be familiar with adequate staining pattern, elimination of background staining, and type of selected antibody. This method is especially important for application in countries with high prevalence of TB as a technique with early diagnostic value in tissue specimens. Early diagnosis using this technique can reduce related morbidity and mortality and decrease the rate of complications due to misdiagnosis and mistreatment of TB.

Conflicts of interest

The authors have no conflicts of interest to declare.