Net Letter

Mycobacterium leprae in ocular tissues: Histopathological findings in experimental leprosy

Sir,

Leprosy is disease of systemic manifestations with a high level of ocular complications.[1] Inside the eyes, the anterior segment is the most common area where *Mycobacterium leprae* is found since it is the coldest part in the eye bulb. In experimental studies, it was shown that the temperature of the eye anterior segment is 3°C colder than the environment.[2] Additionally, *M. leprae* has been found in the iris, part of the eye bulb where it would be safe from the action of systemic drugs used for the treatment of leprosy.[2] The eyes are also frequently studied for complications related to leprosy, being the important criteria for disability grade assessment.[2] *M. leprae* has not been artificially cultivated yet. However, experimental leprosy has been successfully induced in animals such as mice and armadillos, which contributed mainly to improve the knowledge regarding leprosy immunology and pathology, biology of *M. leprae* and drug tests for leprosy.[3,4] Very few experimental studies have been published disclosing the location of *M. leprae* in eye tissues; moreover, almost all were detected after the inoculation of the bacillus in the cornea stroma.

A nine banded armadillo was inoculated with *M. leprae* at a concentration of 10^8 bacilli/ml, through the intracardiac and subcutaneous (thighs) route. The bacilli were obtained from an untreated lepromatous leprosy patient. The study was carried out at Instituto Lauro de Souza Lima (ILSL), Bauru-SP, Brazil, that has legal requirements to keep the armadillos captive for use in scientific research . This study was granted approval by ILSL ethical committee for research. Nodules were observed in the inoculation site after 13 months and systemic leprosy dissemination was observed within 24 months, presenting enlarged inguinal lymph nodes and decrease in the hematocrit. Anesthesia with intramuscular tiletamine/zolazepam 5.0 mg/kg was performed followed by both enucleations. The now blind armadillo was euthanized at this time by exsanguination. The eye bulbs were stained with H&E for morphological analysis and Wade-Fite staining was done for identifying mycobacteria. In the orbital cavity bacilli were found, isolated and arranged in globi, in the ocular muscle fibers, near the sclera and conjunctiva. No local clinical inflammation features such as erythema and edema were observed [Figures 1 and 2]. These findings suggest that direct invasion of the eye ball is possible and may be the main route of involvement of eye in advanced cases of lepromatous leprosy.[1]

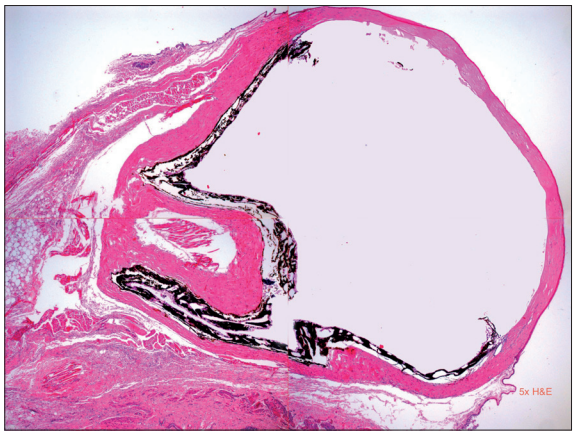

Figure 1: Histological section of half of the eye (H and E, ×5)

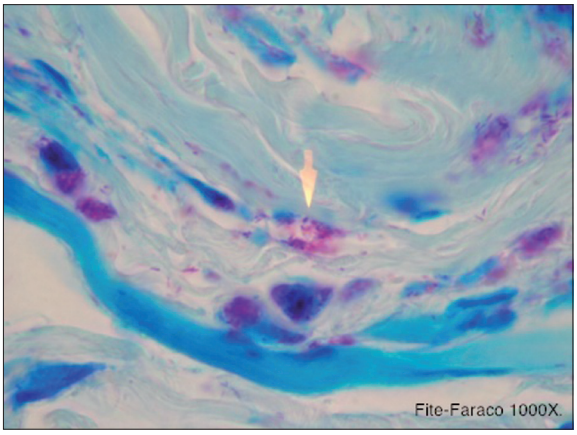

Figure 2: *Mycobacterium leprae* globi (arrow) in the fibromuscular tissue surrounding the sclera with no inflammatory reaction surrounding (Fite-Faraco, ×1000)

How to cite this article: Cardozo AV, Deps P, Antunes JMAP, Andréa de FB, Rosa PS. *Mycobacterium leprae* in ocular tissues: Histopathological findings in experimental leprosy. Indian J Dermatol Venereol Leprol 2011;77:252-3.

Received: May, 2010. **Accepted:** December, 2010. **Source of Support:** Nil. **Conflict of Interest:** None declared.

In advanced untreated lepromatous leprosy patients, it has been observed that the most frequent ocular and extra ocular alterations are madarosis, keratitis (because of the combination of the trichiasis, lagophthalmos and the loss of sensibility in the cornea, secondary to infections), conjuntivitis, scleritis, and episcleritis, the cornea being the first ocular tissue to be involved in the human body.[2,3] The lagophthalmos, a potentially sight threatening lesion, results from motor nerve lesions in leprosy, and is frequently related to type 1 lepra reaction.[5]

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Access this article online	
Quick Response Code:	Website: www.ijdvl.com
	DOI: 10.4103/0378-6323.77490
	PMID: 21393973

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