Comparative analysis of the histomorphometric features and distribution of reticulin fibers in the skin of patients with cutaneous sarcoidosis and tuberculoid form of leprosy

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Abstract

The differential diagnosis between cutaneous sarcoidosis and tuberculoid leprosy (MHT) is not easily achieved because the clinical and histological findings may be similar. The texture analysis of reticulin fibers and the morphometric analysis of the skin lesions could help to distinguish the two processes and add elements to the understanding of the pathogenesis of both diseases. Skin samples from patients with MHT and sarcoidosis have been studied. Clinical data of each patient were obtained from HC - UNICAMP medical files. Histomorphometric analysis of the specimens were recorded. Digital images from reticulin network were acquired in a blinded way and analyzed through ImageJ software.

Key words:

granuloma; reticulin fibers; skin.

Introduction

More than 200,000 new cases of leprosy are detected worldwide annually. Due to the increment of the immigration flows from endemic areas, leprosy cases might be more frequently observed in nonendemic areas, as well. Physicians commonly have difficulty in differentiating tuberculoid form of leprosy (TL) from sarcoidosis' cutaneous manifestation.

With current histopathological methods, it may be difficult to differentiate TL from cutaneous sarcoidosis. The diagnosis of sarcoidosis can be defined after years of treatment for TL without response^{1,2}. The investigation of new diagnostic tools and consequent study of the pathogenetic factors that affect each one of these two diseases is desirable.

Skin biopsies of 33 patients with TL and 24 with sarcoidosis were blindly and retrospectively reviewed by two observers, using histomorphometric analysis on hematoxylin and eosin and Gomori stained sections.

The general objective of this scientific research was to study, comparatively, the histological findings and the distribution of the reticulin fibers in cutaneous samples of patients with sarcoidosis and TL, in order to find reliable criteria for distinguishing one disease from another.

Results and Discussion

Nine of the 25 analyzed features presented significant predictive value for diagnosis ($p < 0.05$). Predominance of tuberculoid granulomas, periadnexal and perineural granulomas distribution, and granulomas replacing the nerves within sweat gland glomeruli were predictive to the TL diagnosis. For sarcoidosis diagnosis, plasma cells within inflammatory infiltrate, dermal fibrosis in affected areas, higher back-to-back distribution of the granulomas toward deep dermis, presence of atypical/bizarre giant cells, greater number of conventional giant cells, and spared nerves beside the granuloma were predictive criteria. The median surface density of reticulin fibers was higher ($p = 0.03$) in sarcoidosis (3.44) than in TL (2.99).

Image 1. a: tuberculoid granulomas in perianexial and perineural distribution; b: granulomas replacing nerves inside sweat gland glomerulus; c: sarcoid granulomas in increasingly crowded distribution toward deep dermis; d: dermal fibrosis around sarcoidal granulomas; e: atypical (arrow) and conventional giant cells (arrowheads); f: reticulin fibers within granulomas and fibrosis around them. [HE (a-e) and Gomori (f) stain. a-b: tuberculoid form of leprosy; c-f sarcoidosis. original magnification x50 (a), x120 (b,d,f); x500 (e)].

Conclusions

The identified histological findings that are predictive for the diagnosis of sarcoidosis and TL may be a useful tool in pathology practice. This study also brings elements that undergird the phenomenon of fragmentation and destruction of the reticulin network within the granulomas of TL and reiterates the importance of morphometry in the histological examination.

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References

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