

HISTOGENIC DIFFERENTIATION OF POLAR TUBERCULOID GRANULOMA AND THE "BENIGN" OR "MALIGNANT" BEHAVIOUR OF HANSENIASIS

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ABSTRACT - Based on a new morphological concept and classification of granulomatous inflammation: the polar granulomas, on the histogenesis of the tuberculoid granuloma of the positive Mitsuda test and on the relationship between the degree of histogenetic differentiation and behaviour of tumors, the Authors concluded that the "benign" or "malignant" behaviour of hanseniasis depends on the degree of tuberculoid differentiation of the lesions. If the lesion is histologically well differentiated toward a polar tuberculoid granuloma (tuberculoid hanseniasis) it will have a "benign" behaviour. On the contrary, if this differentiation is absent (virchowian hanseniasis) or poor (interpolar borderline hanseniasis) the behaviour of the lesion will be "malignant".

Key Words: Hanseniasis. Histogenetic differentiation. Polar tuberculoid granuloma. Granulomatous inflammation.

It is generally accepted that the major or minor degree of histogenetic differentiation of tumors expresses their benign or malignant behaviour. Excluding the fact that numerous degrees of histogenetic differentiation occur only in tumors, it is possible to apply the same general principle of behaviour to hanseniasis, according to the histogenetic differentiation of polar tuberculoid granuloma. This conclusion was based on a new morphological concept and classification of granulomatous inflammation, the polar granulomas 2,3 (Figures 1 and 2).

According to this concept, granulomas were

defined as a reactional hyperplasia of macrophages toward inanimate agents and toward animate agents of low virulence. Based on the type of phagocytosis (complete, with lysis or incomplete, without lysis) by macrophages, on Jadassohn-Lewandowsky's law and on the polar forms of hanseniasis, granulomas were classified in two distinct groups, polar tuberculoid and polar non-tuberculoid.

The polar tuberculoid granuloma (tuberculoid hanseniasis, positive Mitsuda test) comprises two sub-types: a) tubercle-like formed by giant Langhans cells, epithelioid

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cells and lymphocytic ring; b) sarcoid-like formed by epithelioid cells. The models of polar non-tuberculoid granulomas are more diverse. When formed only by macrophages with no giant cells it is called persistent macrophage type which can behave like a culture medium for the etiological agent (virchowian hanseniasis, negative Mitsuda test) or like a storage cell (anthracosis). When represented solely by giant cells it is called giant-cell type (foreign body, Lobo's blastomycosis). If the polar tuberculoid and the polar non-tuberculoid granulomas are present in the same lesion (borderline hanseniasis) the granuloma is called interpolar. If both polar granulomas are supervenient in the same disease (leishmaniasis in early and late stages) the term

bipolar granuloma is used (Figures 1 and 2).

In a study of the histology of the Mitsuda test in 100 healthy and non contact adults inoculated with lepromin A, the Authors⁴ found that the histological structure of the test does not differ from that observed with lepromin H. Another conclusion was related to the presence of various degrees of histogenetic differentiation toward the polar tuberculoid granuloma in the positive Mitsuda test. They were formed from some scattered epithelioid cells up to the fully developed tubercle, i.e., with giant Langhans cell, epithelioid cells and lymphocytic ring which represents the stronger positive reaction of the test. Thus the positive Mitsuda test is an excellent method for the study of the histogenesis of polar tuberculoid granulomas.

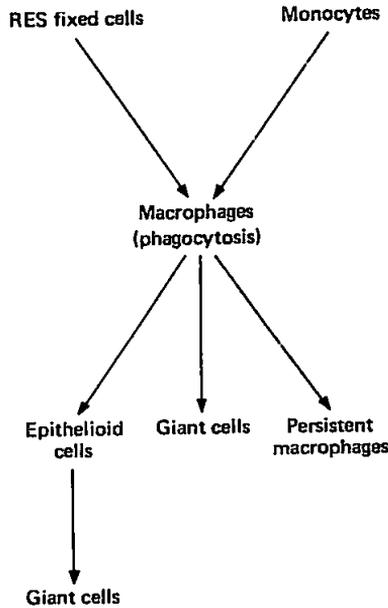


FIGURE 1 .Histogenesis and metamorphosis of macrophages*

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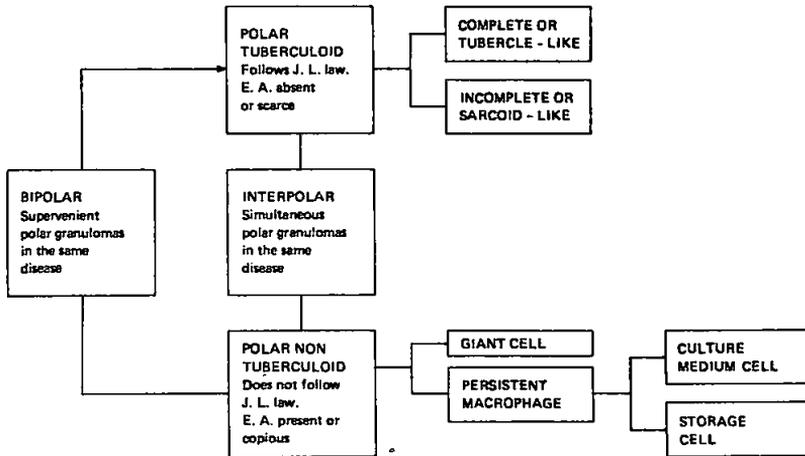


FIGURE 2- Morphological classification of polar granulomas.*

In reality, the principle of histogenetic differentiation can be applied to all forms of hanseniasis. The analysis of the histological, bacterioscopic and immunological features of tuberculoid, virchowian and interpolar hanseniasis reveals that they are related to the degree of histogenetic differentiation toward a polar tuberculoid granuloma of the lesions. The greater the tuberculoid differentiation, the fewer the number of bacilli and the stronger the Mitsuda test would be. On the other hand, the lower the tuberculoid granulomatous differentiation, the greater the number of bacilli and the weaker the Mitsuda test would be. Consequently, the "benign" or

the "malignant" behaviour of hanseniasis will depend on the tuberculoid differentiation of the lesions. In this manner, the macrophages which do not perfectly differentiate into a polar tuberculoid granuloma (tuberculoid hanseniasis) will tend to progress toward interpolar and polar non-tuberculoid granulomas (borderline and virchowian hanseniasis) with progressively more numerous bacilli and less positive, dubious or negative Mitsuda test.

Contrary to what occurs in the majority of infectious diseases the severity of hanseniasis depends much more on the tissue reactions of the host than on the capacity of bacillar

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multiplication. In this way, the cell-mediated immunity (CMI) prevails in hanseniasis through the stimulus of lymphocytes T over the macrophages, which will react according to the constitution of the individual, the "N" factor of Rotbergfi.

If the stimulus is efficient, the macrophages will perform the complete phagocytosis of live bacilli (tuberculoid hanseniasis) or of heat-killed bacilli (positive Mitsuda test) and histogenetic differentiation toward a polar tuberculoid granuloma which confers a "benign" behaviour on the disease. However if the stimulus is inefficient there is

no histogenetic tuberculoid differentiation of the lesion. The incomplete phagocytosis either for live bacilli (borderline and virchowian hanseniasis) or for heat-killed bacilli (dubious or negative Mitsuda test) confers a "malignant" behaviour on the disease.

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RESUMO - Com base em um novo conceito morfológico e classificação de inflamação granulomatosa: os granulomas polares, na histogênese do granuloma tuberculóide teste Mitsuda positivo e na relação entre o grau de diferenciação histogendtica e comportamento de tumores, os autores concluíram que o comportamento "benign" ou "maligno" da hanseníase depende do grau de diferenciação tuberculíde das lesões. Se a lesão histologicamente bem diferenciada em direção a um granuloma polar tuberculáide (hanseníase tuberculóide), ela terá um comportamento "benigno". Ao contrário, se esta diferenciação for ausente (hanseníase virchoviana) ou pobre (hanseníase interpoler), o comportamento da lesão será "maligno".

Palavras chave: Hanseníase. Diferenciação histogénética. Granuloma polar tuberculíde. Inflamação granulomatosa.

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