EDITORIAL

Pneumoconiosis: An Aspect from a Different Angle

Although the pulmonary reaction to all dusts is characterized in the early phase by a stroma of reticulin fibers, and this stroma remains essentially unchanged in reactions to so-called "inert" dusts, in the case of quartz dust, the reticulin is replaced by collagen after a latent period. Many papers have been written attempting to explain why quartz dust is so different as to cause a collagenous conversion of reticulin stroma.

Inasmuch as the prompt conversion of inflammatory reticulin stroma into collagen fibers is a normal and anticipated phenomenon in most tissues other than lung (integumental wounds, within two weeks), it would seem profitable to investigate the failure of such collagenous stromal conversion in the pneumoconioses caused by "inert" dusts!

The inhibition of collagenous conversion of inflammatory reticulin has been studied extensively in connection with the effects of ascorbic acid deficiency and cortisone administration on healing wounds, but the failure of such conversion in pneumoconiotic lungs of otherwise normal animals or persons has not aroused curiosity. Nevertheless, collagenous stromal conversion in lungs occurs promptly (fortunately!) in surgical or traumatic wounds.

Even as a result of the inhalation of a fibrogenic dust, such as quartz, there is a delay in collagenous conversion of the inflammatory stroma amounting to six to 12 months in animals. Why is there a difference in the behavior of the pulmonary stroma developing secondary to trauma and that secondary to a dust reaction? Is the basis for this difference inherent in the agents causing the injury or in the identity of the tissues responding to the injury? It would seem that there is some basis for believing that the pulmonary tissues responding to injury are not identical in the case of dust on the one hand and of surgical trauma on the other.

In the case of surgical trauma, blood vessels and bronchi are transected which have appreciable periadventitial stroma capable of reacting to injury similar to mesenchyme anywhere in the body, a reaction which results in a collagenous scar within two or three weeks under normal circumstances. In contrast, the tissue reacting to dust particles is the alveolar membrane which, according to Waddell,* consists of multi-potential cells capable of assuming mesenchymal functions. It is probable that the functional capability of these transformed alveolar cells (like that of glial cells) is different from fibroblasts derived from mesenchymal tissue.

These thoughts suggest that the functional capabilities of alveolar cells, as well as their ultramicroscopic alterations, are fertile fields for investigation.

References

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