

British Journal of Dermatology

Volume 156 Issue 1 Page 85 Issue 1 - 91 - January 2007

To cite this article: M. Just, M. Ribera, E. Monsó, J.C. Lorenzo, C. Ferrándiz (2007) Effect of smoking on skin elastic fibres: morphometric and immunohistochemical analysis
British Journal of Dermatology 156 (1), 85–91.
doi: 10.1111/j.1365-2133.2006.07575.x

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Abstract

DERMATOPATHOLOGY

Effect of smoking on skin elastic fibres: morphometric and immunohistochemical analysis

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Conflicts of interest

None declared.

Summary

Background It has been established during recent years that smoking is an independent risk factor for the development of premature facial wrinkling. The underlying mechanism is not well known, but elastic fibres of the dermis seem to be the major target of smoke components.

Objectives To determine quantitative and qualitative changes of the dermal elastic tissue of nonsun-exposed skin induced by smoking, as well as the possible mechanisms responsible for them.

Methods Sixty-nine patients were recruited (20 nonsmokers, 19 former smokers and 30 smokers). Using static morphometry and immunohistochemistry and lectin staining we analysed elastic fibres of the dermis and their major components, elastin and microfibrillar component.

Results Significantly higher values for the number of elastic fibres mm^{-2} and the percentage of the area filled by them in the reticular dermis were found in smokers. Cumulative tobacco dose showed statistically significant correlations with both morphological parameters (Spearman's rank correlation coefficient). Immunohistochemistry demonstrated that the two main components of elastic fibres were altered in smokers. Plasma protease inhibitors and lectin staining were negative in all the samples.

Conclusions Smoking is an independent risk factor for the increase of elastic fibres in the reticular dermis of nonexposed skin, and it acts on their two main structural components, elastin and microfibrillar component. This increase in the area of elastic fibres in smokers is not due to newly synthesized elastic material, but to their degradation, as occurs in solar elastosis and which acts in an additive manner.