

Could cigarette smoke be associated with metaplastic type of meibomian gland dysfunction?

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Madam, The meibomian glands are located in the tarsal plates of the eyelids. The diseases involving these glands belong to a broad classification. However, the metaplastic diseases of the meibomian gland are the focus of this letter.¹ We intend to propose the possible role of cigarette smoke as an active agent in developing metaplastic type of meibomian gland dysfunction (MGD).

A meibomian gland is made up of multiple acini that are arranged around a long central duct. Owing to its vigorous function of producing meibum and maintaining tear film stability, the gland requires a constant turnover and differentiation of cells. Consequently, during this intricate cascade of continuous production and differentiation of cells, even a slight deviation from normality can lead to drastic pathological effects.² We presume that oxidative stress can produce such a pathologic deviation.

One of the most common causes of increased oxidative stress in cells is exposure to cigarette smoke. It has also been experimentally established that cigarette smoke is a well-known inducer of metaplastic changes; especially known to cause squamous metaplasia in the bronchial epithelium.³ Therefore, exposure to cigarette smoke may also be a culprit when the meibomian orifice, owing to its superficial location on the eyelid, is exposed to the components of cigarette smoke. Cigarette smoke contains carbon particles and other toxic compounds that begin the cascade of inflammation and during the attempts of phagocytic elimination of these toxic compounds, inflammatory damage to DNA and proteins can occur.⁴ The aspect of protein damage and hyperkeratinization in response to increased oxidative stress has already been studied and implicated in the pathogenesis of MGD.²

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Furthermore, it has been demonstrated that EGF (Epidermal Growth Factor) is produced in epithelial cells in response to smoke and that further increases the possibility of metaplastic as well as hyperplastic changes.⁵

Therefore, we suggest that there exists a strong relation between exposure to cigarette smoke and the development of metaplastic meibomian gland dysfunction. Further studies in this regard might help in prevention, as well as newer diagnostic approaches towards MGD especially in populations exposed to cigarette smoke on a regular basis.

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EA: Idea, design and writing.

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Both authors agree to be accountable for the aspects of the work.