The Quandary of Climacteric Skin Ageing

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Photoageing Behavioral ageing Catabolic ageing, Type
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pels research to understand the physiological changes related to skin ageing. A classical, yet oversimplified classification of cutaneous alterations contrasts intrinsic ageing and photoageing. That dual classification does not precisely describe the wide diversity of factors influencing skin ageing. In such a perspective, seven distinct types of factors should be considered (table 1) [1]. In this framework, cutaneous climacteric ageing enters the spectrum of endocrine ageing. Over the past years, hormonal involvement in the ageing process of many tissues and organs has attracted increased interest. Molecular biology and biometrology have helped to sort through some unresolved questions. As a result, a fair amount is known about the basic science involved in estrogen functions. Hormone replacement therapy (HRT) is aimed at alleviating menopausal symptoms and is indicated for the prevention of long-term sequelae of estrogen deficiency. The preventive benefits include a substantial reduction in osteoporosis risk and, possibly, a reduction in the risk of coronary heart disease. Unfortunately, the picture that emerges from skin biology is odd and the influence of estrogen changes on cutaneous structures and functions remains largely unsubstantiated.

The open study by Callens et al. [2] in this issue of the Journal is an additional attempt at analytic quantification of subclinical skin changes related to climacteric ageing and HRT. Before analyzing the data, one should remember the potential limitations of such a cross-sectional study design. The causal relationship between measures, estrogen deprivation and HRT cannot be determined with certainty because the characteristics of the women's skin when they faced the decision regarding HRT are unknown. Subjects who are more likely to use HRT most probably belong to sociodemographic groups different from most untreated postmenopausal women [3]. Hence, the other factors influencing skin ageing may also differ between the two groups and introduce a bias to the study.

That human skin changes dramatically with increasing age is patently obvious. However, climacteric ageing lacks unique and distinctive features. The manifestations such as xerosis and atrophy reflect structural changes in both the epidermis and dermis. Integumental reactivity also apparently changes at the time of the menopause, and there is reason to believe that the skin might then become more vulnerable to environmental insults [4-6]. At this point, one enters into a speculative realm, the effect of climacteric ageing being more subtle than has been expected.

It is generally held that dermal atrophy and osteoporosis are hallmarks of postmenopausal life. There is also good evidence that HRT helps to maintain the dermal and bone collagen network. The findings of Callens et al. [2] are in line with such a current concept.

Convincing beneficial effects of HRT on the epidermis have been lacking for a long time. In particular, the work of Callens et al. [2] and previous studies failed to reveal any significant improvement in electrical skin capacitance during HRT [7, 8]. However, the methods used in these clinical experiments are not appropriate to detect subtle changes in the water-holding capacity of the stratum corneum. By contrast, when the sensitive plastic occlusion stress test [9] is applied, HRT appears to be responsible for an improve-

Table 1. Types of cutaneous ageing

Determinant factor

passage of time

genetics (premature ageing, phototype)

ultraviolet and infrared irradiations

diet, tobacco, alcoholic abuse, drug addiction

chronic intercurrent debilitating disease

(infections, cancers)

dysfunction or ageing of hormonal systems

(ovaries, testes, thyroid)

gravitation force

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ment in the water-holding capacity of the stratum corneum accompanied by a better barrier function of the epidermis [8]. The clinical relevance of these observations is still obscure. There is, however, a possible link between the functional changes of the stratum corneum [4, 5, 8] and the development of climacteric xerosis.

It is beyond any doubt that the sebaceous glands are under the influence of sexual hormones. In the long term, estrogens given in pharmacological doses inhibit sebaceous secretion. Hence, the increase in sebum amount at the skin surface of women receiving HRT (estradiol plus diverse progestagens) as reported by Callens et al. [2] is a puzzling finding which does not receive a biological explanation. Progestagens could indeed play a role. However, the male level of androgens is always manifold greater than the female level, in spite of which many normal women have sebum secretion rates as high as men. It is therefore likely that other factors in addition to sexual hormones are operative in supporting adult sebum secretion rates at all ages. It should also be noted that any variation in the casual sebum

level at the skin surface is not solely governed by the sebaceous gland activity. Other factors such as the stratum corneum texture, the size of the sebaceous follicle reservoir, the sebum fluidity and resorption significantly influence the oily aspect of the skin. Because it is not possible to determine all the parameters influencing the casual sebum level, it is certainly premature to speculate on the cause of either a decline in the sebum excretion rate at the time of the menopause or an apparent increase with HRT.

At the present time some facets of climacteric skin ageing create a quandary. Drawing precise and substantive conclusions from disparate pieces of information requires extrapolations to be made, for which sufficient experimental validation is not yet available. However, taken together the epidemiologic, clinical and experimental data strongly implicate estrogen deprivation at the climacteric as a contributing factor in skin ageing. HRT alone or in combination with other treatments [6] likely alleviates some effects of climacteric ageing.

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