

Female pattern hair loss, biological ageing and the Leiden Longevity study

People age at different rates and individuals with the same chronological age vary widely in terms of health and function. Biological age describes the difference between the population cohort average life expectancy and the perceived life expectancy of an individual of the same age. Essentially it is an indication of how well your body is functioning relative to your calendar age.

Biomarkers commonly used to determine biologic age such as diet, stress levels, alcohol consumption, education levels, sleep patterns, sexual habits, blood pressure, resting heart rate strength and mobility.

Should patterned hair loss also be considered to be a phenotypic marker of biological ageing?



Fig. 1. Sinclair Scale for Grading Female Pattern Hair Loss. Stage 1 is normal. Stages 2-5 represent the appearance of progressive scalp hair loss in women when the scalp is viewed from above.

Men and women both lose hair progressively with advancing age and men and women with premature hair loss appear prematurely aged. Men and women with premature hair loss also have an increased risk of death overall and in particular from diabetes mellitus and heart disease that persists after adjusting for the known association between patterned hair loss and metabolic syndrome.

Noordam et al used patient data from the Leiden Longevity study to demonstrate that women with known cardiovascular risk factors such as low HDL cholesterol and hypertension and biomarkers of ageing such as IGF-1 and Vitamin D levels have an increased risk of female pattern hair loss (FPHL). Noordam et al also found that more advanced FPHL is associated with additional biomarkers of ageing and longevity. This supports the contention that FPHL is a biological marker of senescence and predictor of reduced longevity.

Male and female pattern hair loss are both genetically based, suggesting they contribute to evolutionary fitness. Male pattern hair loss (MPHL) and in particular premature MPHL have a negative impact on reproduction. While MPHL does not affect virility, premature MPHL makes men less attractive and men with premature hair loss average fewer lifetime sexual partners.

Female pattern hair loss (FPHL) normally occurs at or after menopause and potentially signals waning fertility to a prospective mate. Women with premature FPHL appear prematurely aged and are less attractive. In addition to the psychological problems associated with premature FPHL, affected women have an increased risk of metabolic syndrome, polycystic ovarian syndrome, hypertension diabetes and hypercholesterolemia.

Additional epigenetic factors such as methylation of the androgen receptor gene are involved both in the pathogenesis and patterning of MPHL and the pathogenesis of ageing. Epigenetic methylation is considered to be a specific biomarker of organ-specific biological ageing.

Baldness severity is an important guide when assessing the chronological age of a stranger. Moreover, patterned hair loss is also likely to be a phenotypic marker of senescence and premature patterned hair loss is an indicator of reduced longevity and reduced evolutionary fitness. Perhaps that is why some people perceive hair loss negatively and those who become our patients feel sufficiently distressed by their hair loss to see dermatologists and hair transplant surgeons for treatment.

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