Acne sufferers' cells may be protected against aging

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Scientists at King's College London have found that people who have previously suffered from acne are likely to have longer telomeres (the protective repeated nucleotides found at the end of chromosomes) in their white blood cells, meaning their cells could be better protected against ageing.

Telomeres are repetitive nucleotide sequences found at the end of chromosomes which protect them from deteriorating during the process of replication. Telomeres gradually break down and shrink as cells age, eventually leading to cell death which is a normal part of human growth and ageing.

Previous studies have shown that white blood cell telomere length can be predictive of biological ageing and is linked with telomere length in other cells in the body.

The study, published today in the *Journal of Investigative Dermatology* measured the length of white blood cell telomeres in 1,205 twins from the TwinsUK cohort. A quarter of the twins reported having experienced acne in their lifetime.

Statistical analyses which adjusted for age, relatedness, weight and height showed that telomere length in acne sufferers was significantly longer, meaning that white blood cells were more protected from the usual deterioration with age. One of the genes involved in telomere length was also associated with acne in a replication sample from the UK Acne Genetic study, also lead by King's scientists.

Dermatologists have long noted that the skin of acne sufferers appears to age more slowly than the skin of those with no history of acne. Signs of ageing such as wrinkles and skin thinning often appear much later in people who have experienced acne in their lifetime. It has been suggested that this is due to increased oil production but there are likely to be other factors involved.

The researchers also examined gene expression in pre-existing skin biopsies from the same twins to identify possible gene pathways linked to acne. One gene pathway (the p53 pathway), which regulates programmed cell death, was found to be less expressed in acne sufferers' skin. This requires further investigation to identify other genes involved in cell ageing and how they differ in acne sufferers.

Lead author of the study, Dr Simone Ribero, a dermatologist from the Department of Twin Research and Genetic Epidemiology at King's, said: 'For many years dermatologists have identified that the skin of acne sufferers appears to age more slowly than in those who have not experienced any acne in their lifetime. Whilst this has been observed in clinical settings, the cause of this was previously unclear.

'Our findings suggest that the cause could be linked to the length of telomeres which appears to be different in acne sufferers and means their cells may be protected against ageing. By looking at skin biopsies, we were able to begin to understand the gene expressions related to this. Further work is required to consider if certain gene pathways may provide a base for useful interventions.'

Dr Veronique Bataille, senior author of the paper and another dermatologist in the Department of Twin Research and Genetic Epidemiology said: 'Longer telomeres are likely to be one factor explaining the protection against premature skin ageing in individuals who previously suffered from acne. Another important pathway, related to the p53 gene (a protector of the genome), is also relevant when we looked at gene expression in the skin of acne twins compared to twin controls.'

Limitations of the study include an entirely female twin cohort and it also did not identify a causal relationship. The study also primarily used self-reporting of acne severity and treatment.

More information: Acne and telomere length. A new spectrum between senescence and apoptosis pathways.' By Ribero et al is published in *Journal of Investigative Dermatology* on 28 September 2016.

Provided by King's College London