Morphological characterization of solar lentigines by in vivo reflectance confocal microscopy: a longitudinal approach.


ABSTRACT

Solar lentigines are benign hyperpigmented skin lesions. Despite their widespread distribution, knowledge on the mechanisms of development is largely unknown. A clinical study was designed in which solar lentigines were characterized using various non-invasive clinical techniques. A subset of solar lentigines was followed over a 5-year time period. One hundred and twenty-eight solar lentigines were evaluated using in vivo reflectance confocal microscopy (RCM) for the evaluation of the length and density of their dermal papillae as well as the deformation of the alignment pattern of hyperrefractive basal cells. Skin colour, colour contrast, the size of the solar lentigo, epidermal proliferation rate, melanin and haemoglobin content were quantified. RCM imaging of solar lentigines revealed a profound structural deformation of the dermal papillae, as the alignment pattern of hyperrefractive basal cells shifted from a circle in non-lesional skin to an irregular non-circular shape in solar lentigines. There was a rise in the number of dermal papillae, and these dermal papillae were significantly longer. Solar lentigines had increased melanin and haemoglobin levels and a higher rate of epidermal proliferation. For a subset of nineteen solar lentigines, a longitudinal study was set-up in which these measurements were repeated 5 years after the first evaluation. The deformation and the number of the hyperrefractive dermal papillary rings increased significantly over the 5-year time span. The size of the lesion increased, and the skin colour became darker. RCM is a useful non-invasive clinical tool for the characterization of solar lentigines, in particular the compressive deformation of the dermal papillae. This deformation became more severe over a time period of 5 years. To our knowledge, this is the first time that the in vivo time-dependent progression of solar lentigines was supported by RCM images, contributing to an improved understanding of the formation and progression of solar lentigines.