High frequency ultrasound assessment in cutaneous senescence process

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Introduction:
Senescence is a natural, slow and irreversible process, influenced by intrinsic and extrinsic factors. Skin aging can be partially attributed to glycation and it is characterized by: decreased resistance to mechanical stress, impaired wound healing and distortion of dermal vascular elements. The study focuses on the identification of imagistic markers that could quantify the skin ageing.

Methods:
The study involved 40 patients subdivided in four age categories. Using the Dermascan transducer (20MHz), cutaneous ultrasound images were taken from two sites with different exposure to ultraviolet (UV) radiation: the zygomatic area (ZA) and medial arm area (MA). Parameters of interest were the dermis thickness and dermis echogenicity.

Results:
The parameters evaluating the cutaneous senescence revealed different values according to age and UV rays exposure. The dermis thickness decreases with age; the subepidermal low echogenicity band (SLEB) increased with age and correlated with UV exposure; LEPs/LEPi represents an objective marker of the photoaging process. The complex process of ageing that involves different mechanisms including advanced glycation end products (AGES) could be assessed by high frequency ultrasound.

Conclusion:
Ultrasound allows the in vivo and “in real time” quantification of certain histological parameters. It could be used to assess the severity of cutaneous senescence process and the efficacy of anti-ageing therapy.

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