



The effect of nitrogen plasma on the skin and hair follicles: a possible promising future for the treatment of alopecia

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Abstract:

Nowadays, there is a great attention to the plasma applications in medicine. Not only does cold atmospheric pressure plasma provide a therapeutic opportunity to control redox-based processes, it is also an innovative method in rejuvenation. Given the current interest in new methods of rejuvenation, we aimed to introduce a novel pulsed nitrogen plasma torch with potential use in rejuvenation. We investigated production of reactive species in different energies by spectroscopy and also measured nitric oxide and O₂ concentration and evaluated the flame temperature. Fifteen Wistar rats were divided into three groups based on the applied energy settings; the skin of the animals was processed with plasma. For quantitative evaluation of this technique on rejuvenation, skin biopsies were taken from the unexposed and treated areas. The spectroscopy results showed the presence of nitric oxide in plasma and the concentration was suitable for dermatological applications. A significant increase was observed in the epidermal thickening, fibroblasts proliferation and collagenesis ($P < 0.05$). Interestingly, plasma led to a temporary increase in the diameter of primary and secondary hair-follicles compared to the control. The results confirmed the positive effects of this pulsed nitrogen plasma torch on rejuvenation and also revealed a new possible aspect of cold plasma, its effect on hair follicles as a promising area in the treatment of alopecia that requires further clinical and molecular studies.

Biography

She is a researcher at Shahid Beheshti University and Tajrish hospital

Publication of speakers

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