

Morphological changes of the skin after physical therapy and experimental acupuncture

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Abstract

90% of all the Chinese and physical medicine treatments are performed through the skin. Skin pigmentation changes are a common aging effect. Moles, freckles and lentiginos are flat brown spots, around 5 mm in diameter. They are a risk factor for melanoma but none of these skin changes have been reported to be associated with physical trauma or mechanical stimulation. The aim of the research is to inspect the published papers and results for possible morphological changes from the treatments with physical therapy and acupuncture, to determine which are the most common changes and which treatments occur more often. In all treatments with Chinese and classical medicine, morphological changes of the skin are possible, whereby the lesions that appear are not permanent and only a small percent remain longer. The treatments are generally safe to use in terms of morphological changes of the skin. If the acupuncture stimulation is done with greater dose, it leads to greater changes of the skin at the molecular level, with very low possibility of structural changes.

Key words - acupuncture, traditional Chinese medicine, dermatology, skin, physical therapy

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I. Introduction

90% of all the Chinese and physical medicine treatments are performed through the skin. The first contact medium is the skin. The skin is most exposed organ to all external influences and external factors.

Skin pigmentation changes are a common aging effect. Moles, freckles and lentiginos are flat brown spots, around 5 mm in diameter. They are a risk factor for melanoma but none of these skin changes have been reported to be associated with physical trauma or mechanical stimulation. In Traditional Chinese Medicine (TCM), these dark spots on the face or the head are associated with blood stasis, which in turn is caused by Qi deficiency, that is a result of aging process. Serious adverse reactions in acupuncture treatments are rare. Less serious adverse reactions including dizziness, pain, tiredness and bruising are uncommon. [1] Acupuncture, as part of the TCM is a treatment involving insertion of needles into specific points on the body surface, called acupuncture points, by penetrating the epidermis, dermis, subcutaneous layer or muscles. The therapeutic effects of acupuncture treatment are induced by needle insertion or manipulation, therefore it is hypothesized that the intensity of the acupuncture stimulation is possible to enhance its therapeutic efficacy. [2]

Cupping therapy is also part of TCM and leaves temporary round skin marks. The skin color deformations appearing afterwards are widely used as a diagnostic parameter. Skin color deformations such as purpura and ecchymoses are induced by the vacuum in the suction cup. The vacuum is proved to generate a negative pressure that induces heat production and alters the tissue perfusion and metabolism. Cupping can cause side effects such as persistent skin discoloration, burns or scars, but severe cases are rare. [3] [4]

Gua sha treatment is part of TCM and is done with a gua sha massage tool applying downward pressured strokes. These strokes cause petechiae - small, red-rash or bruises marks to appear on the skin. The petachiae appearing means it was caused extravasation of blood from the peripheral capillaries. The color of the petechiae indicate issues on the body just like the cupping technique. [5]

Physical therapy includes variety of treatments, including electrical stimulation, manual therapy, kinesio taping, laser therapy and etc. The manual therapy may show mild to moderate adverse effects after practising some techniques, but usually resolve within 24 h and those effects are either neck/back pain of headache. None have shown morphological changes of the skin. [6]

II. Material And Methods

The aim of the research is to inspect the published papers and results for possible morphological changes from the treatments with physical therapy and acupuncture, to determine which are the most common changes and which treatments occur more often.

The aim is also to acquaint the medical and professional workers with the possible changes of the skin during the treatments and to which should be paid special attention.

All data is obtained by researching randomly selected scientific papers that are relevant to the topic and from which we would have evidence and credible results.

III. Results And Discussion

A study was done on kinesio tape treatment as part of the physical therapy, on 60 patients. In 5 patients there was skin reaction - allergy with heat and rash and in 3 patients appeared chafes (blisters). No other changes were visible. [7]

A study done on 95 patients treated with electrical stimulation therapy (EST) for treating complex acute and chronic wounds showed that the wound size decreased by 44.7%, epithelialization (full or partial) increased by 80.4% and complete granulation occurred in 30.4%. Exudate, necrosis, fibrin and wound odor decreased. There were a few adverse events, including maceration in 4 patients and pain in 1 patient at the wound edge, at the wound exposure to the dispersive electrode. In 4 patients the wound status deteriorated and 7 patients required surgery (mainly debridement or second amputations). Mainly, EST is a safe and effective treatment for chronic and complicated wounds, and is well tolerated by patients. [8]

UVA exposure has been shown that induces morphological changes and reduces the collagen contents in human dermal fibroblasts. UVA exposure inhibits the actin filaments polymerization and induces skin fibroblasts morphological changes. The reductions in the collagen synthesis is accelerated by these morphological changes in the fibroblasts. [9]

In a study done on 18 healthy subjects with fango (mud) heat therapy, the skin parameters showed a short-time temperature effect with an expanded perfusion of the microcirculation and a covering of the superficial capacitance system. [10]

Pigmentation of the skin after electro-acupuncture or acupuncture in patients is not a common appearance. A research was found reporting case series including four cases of short-lived and long-term skin pigmentation with dark spots after repeated strong electro-acupuncture or acupuncture stimulation. In all four cases the pigmentation appeared after long-term treatment. The skin changes faded gradually and were hardly seen after one month and in two cases the pigmentation has reduced in size and color intensity by more than 50% in two years. The authors stated that the pigmentation of the skin was likely a specific consequence of the needling and as closely linked with the acupuncture dosage regardless of whether the stimulation was given manually or by electro-acupuncture. [11]

Another research presented a case in which has been done repeated needling of the Yin Tang point in a period of 6 years and was determined to cause textural changes and pigmentation to the skin. Other cases have reported pigmentation changes but were shorter lived and were associated with strong needle stimulation. As a possible cause the author stated that it might be because the patient bled occasionally at Yin Tang acupoint over the course of 6 years, which might caused adhesion that blocked the smooth flow of blood and Qi at the acupoint. Coming from the fact that the patient already had a condition with Qi and blood stagnation, she might was predisposed to Qi and blood stagnation in any part of the body. [1]

In one case, the pigmentation was caused by a silver needle implanted for 10 years, from which was developed a pigmentation change that mimicked a blue mole. [1]

In a study done on giant anteaters was said that the nerves and connective tissues are the main histological structures found in the acupoints transposition regions, as similar said in the other studies, claiming that the main histological component of an acupoint is the nerve. Based on the results, the neurovascular bundles probably function as morphological substrate and some form of information transfer from and to the acupuncture points. [12] Similar to other study done on humans, showed that during visceral disorders there are neurogenic spots which are caused by activation of somatic afferents and the same are found in the same anatomical locations as the traditional acupuncture points. They are found to show mechanical hypersensitivity. reveal high electrical conductance and are consistent with the physiological characteristics of acupuncture points. [13]

In a study done for comparison between the effects of surface-modified nanoporous acupuncture needle and conventional needle, it showed that the nanoporous needle induced larger mechanical load than the conventional; likewise, the nanoporous needle treatment produced greater morphological changes in the muscle layer thickness around the needle track than the conventional needle treatment; and at ST36 point resulted with longer duration of analgesic effect and longer-term treatment efficacy compared with the conventional acupuncture. Morphologically, the rotation technique with conventional acupuncture needle induces collagen

winding in the subcutaneous connective tissue without structural changes in the muscle layers. The acupuncture done with nanoporous needle resulted in winding of both subcutaneous connective tissues and muscles, thus, the morphological changes were relatively minimal. [2]

In a case study including 68 year woman who suffered from low back pain and sciatica, the symptoms worsened after acupuncture treatment. The findings showed there was a mass formed as a chronic inflammatory granuloma due to the acupuncture treatment. [14]

In other report adverse skin reactions events related to acupuncture were subcutaneous haematoma, skin bruising, bleeding and needle site pain. The most common adverse events were subcutaneous haematoma and haemorrhage in the needling points. The final conclusion however is that acupuncture is a safe treatment with low risk of adverse events in the clinical practice. [15]

There are a lot of cases that prove and show the fact that acupuncture and other Chinese medicine treatments help in the healing and improve the skin conditions. An experimental study done for psoriasis lesions found that acupuncture, electro-acupuncture and fire acupuncture all improved skin lesions, inhibited keratinocyte proliferation, reduced epidermal thickness and CD3+ T cell infiltration. These acupuncture techniques also decrease the inflammatory cytokine secretion. [16]

98% of the results found for the research show that acupuncture actually helps with morphological changes in the skin and that it is very rarely the cause of the same. In general, the reported side effects on the skin are of minor importance.

IV. Conclusion

In all treatments with Chinese and classical medicine, morphological changes of the skin are possible, whereby the lesions that appear are not permanent and only a small percent remain longer. The treatments are generally safe to use in terms of morphological changes of the skin. If the acupuncture stimulation is done with greater dose, it leads to greater changes of the skin at the molecular level, with very low possibility of structural changes.

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