

COSMETIC FACIAL ACUPUNCTURE AS A NON-INVASIVE ALTERNATIVE TO SKIN AGEING: A REVIEW OF THE SCIENTIFIC EVIDENCE

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Abstract

Introduction: Skin ageing is a multifactorial biological process with a documented impact on quality of life and psychological well-being. Demand for non-invasive treatments has grown steadily, and cosmetic facial acupuncture has emerged as an alternative based on the principles of Traditional Chinese Medicine and with biologically plausible mechanisms of action. **Objective:** To systematically review and critically analyse the available scientific evidence on cosmetic facial acupuncture as an approach to skin ageing, identifying its mechanisms, clinical outcomes, safety profile, and limitations in the literature. **Methodology:** A literature search was conducted in the PubMed/MEDLINE, Cochrane Library, Scopus, Web of Science, CNKI and Wanfang databases, with no restrictions on date or language. Randomised clinical trials, prospective pilot studies, systematic reviews, and narrative review articles were included. Methodological quality was assessed using the Jadad scale and the GRADE system. **Results:** The studies identified report measurable improvements in skin elasticity, hydration, muscle tone, and wrinkle reduction, with a favourable safety profile. The proposed mechanisms of action include stimulation of dermal fibroblasts leading to collagen synthesis, improved microcirculation, lymphatic modulation, and neuroendocrine activation. The available evidence is still predominantly preliminary, with a limited number of large-scale randomised clinical trials. **Conclusion:** Cosmetic facial acupuncture is a promising approach with a biological basis, but the existing evidence does not yet permit formal clinical recommendations. Larger-scale controlled trials with standardised methodologies and long-term follow-up are required.

Keywords: Cosmetic Facial Acupuncture, Skin Ageing, Rejuvenation, Collagen, Elasticity, Integrative Medicine, Traditional Chinese Medicine.

1. INTRODUCTION

1.1 Skin ageing as a clinical and social challenge

Skin ageing results from the interaction between intrinsic factors, which are genetically determined and associated with chronological cellular ageing, and extrinsic factors, namely cumulative sun exposure, smoking, pollution, and oxidative stress. (Gupta & Gilchrest, 2005) From a histological perspective, it is characterised by a progressive decrease in dermal collagen content, estimated at a reduction of approximately 1% per year throughout adulthood (Shuster et al., 1975), by the degradation of elastic fibres, by a reduction in epidermal thickness and by a decrease in local vascularisation. (Cheng et al., 2024) The most common clinical manifestations include static and dynamic wrinkles, ptosis of the facial soft tissues, deepening of nasolabial folds and marionette lines, loss of facial volume and definition, and changes in skin texture, hydration, and radiance. (Yun

et al., 2013) These changes have a documented impact on self-esteem and psychological well-being, particularly in women from their forties onwards. (Gupta & Gilchrest, 2005)

1.2 The anti-ageing market and the demand for non-invasive alternatives

The growth of the aesthetic medicine market reflects the social dimension of this concern. In 2024, the global market for complementary and alternative medicine for anti-ageing was estimated at around \$90 billion, with projections for growth at a compound annual rate of 7.5% until 2034. (Grand View Research, 2024) Acupuncture is explicitly part of this segment, alongside herbal supplements, and mind-body practices. (Emergen Research, 2024) Conventional aesthetic medicine treatments—botulinum toxin, hyaluronic acid dermal fillers, microneedling and laser procedures—have documented clinical efficacy, but are associated with inflated costs, the need for periodic repetition, potential adverse effects and, with prolonged use of neuromodulators, the risk of progressive muscle atrophy. (Alam et al., 2020) There is therefore a growing demand for minimally invasive approaches, with shorter recovery times and framed within a holistic view of health. (Cheng et al., 2024) In this context, cosmetic facial acupuncture emerges as an alternative that combines the therapeutic principles of Traditional Chinese Medicine with biologically plausible mechanisms of action in the field of skin regeneration. It acts simultaneously on the face, through local stimulation of acupuncture points and controlled microtrauma, and on the body, addressing internal imbalances which, from the perspective of TCM, manifest externally in the skin and facial tone. (Barrett, 2005)

1.3 Definition and modalities of cosmetic facial acupuncture

Cosmetic facial acupuncture (CFA) encompasses a set of techniques that share the common feature of applying needles to the face, neck, and scalp for rejuvenation purposes. There are three main clinically documented modalities. Conventional cosmetic facial acupuncture uses fine-gauge needles inserted into facial acupuncture points and distal body points, with the aim of balancing the internal organs and promoting the circulation of qi and blood. (Yun et al., 2013) Thread acupuncture involves implanting biodegradable polydioxanone (PDO) threads into facial tissues, producing a prolonged mechanical stimulus with a lifting effect and sustained collagen regeneration. (Yun & Choi, 2017) Jae-Seng acupuncture, developed in South Korea, involves inserting needles into motor points of the facial muscles with the aim of restoring muscle tone and reducing expression lines. (Cho et al., 2015)

1.4 Objectives

The objectives of this article are: (1) to characterise the proposed biological mechanisms of action for FAC; (2) to synthesise the clinical results of the available studies; (3) to analyse the safety profile and documented adverse effects; (4) to compare FAC with conventional aesthetic medicine treatments; and (5) to identify priority research gaps.

The central question guiding this review is as follows: what is the documented clinical efficacy and safety of cosmetic facial acupuncture, based on the evidence available up to 2025?

2. METHODOLOGY

The aim of this review was to gain a better understanding of what the scientific evidence says about cosmetic facial acupuncture: how it works, what the studies show, whether it is safe, and how it compares with more common treatments.

2.1 Study design

This review follows the principles of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), adapted for literature reviews with emerging evidence, where the volume of available randomised clinical trials does not yet permit a formal quantitative meta-analysis. (Page et al., 2021)

2.2 Search strategy

The literature search was conducted in the PubMed/MEDLINE, Cochrane Library, Scopus, Web of Science, China National Knowledge Infrastructure (CNKI), and Wanfang Data databases. The search terms used in English were: 'facial cosmetic acupuncture,' 'facial acupuncture rejuvenation,' 'cosmetic acupuncture skin aging,' 'thread embedding acupuncture face,' 'acupuncture wrinkles,' 'acupuncture facial elasticity' and 'acupuncture collagen skin.' No restrictions were applied regarding publication date or language.

2.3 Inclusion and exclusion criteria

The following were included: prospective clinical studies with a minimum of five participants; systematic or narrative reviews on AFC; and studies on biological mechanisms of action relevant to skin regeneration. The following were excluded: individual case reports without objective outcome measures; studies that did not explicitly describe the acupuncture intervention on the face or neck; and studies with insufficient data for meta-analysis.

2.4 Recognised limitation

The available evidence on facial acupuncture consists of small-scale pilot studies, without a parallel control group and without blinding. This limitation restricts the level of evidence that can be established and requires caution in interpreting the results. This review reflects the current state of research without overstating the conclusions permitted by the existing evidence.

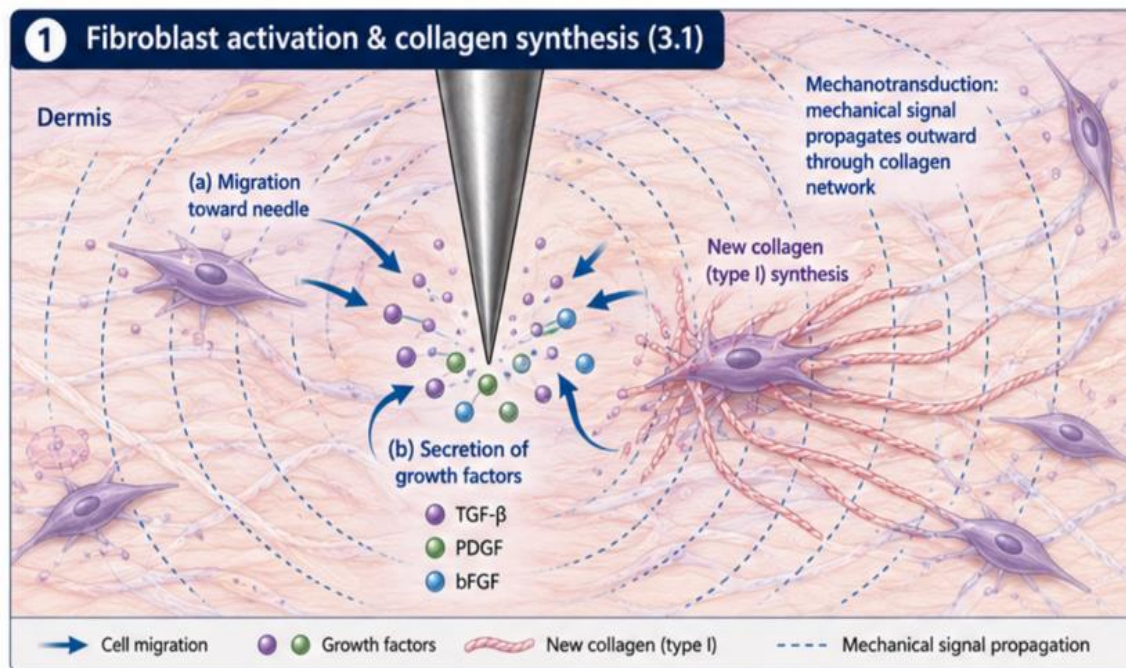
3. MECHANISMS OF ACTION OF COSMETIC FACIAL ACUPUNCTURE

3.1 Stimulation of fibroblasts and collagen synthesis

The proposed central mechanism for the dermal effects of cosmetic facial acupuncture is the activation of dermal fibroblasts through the controlled microtrauma generated by needle insertion. Fibroblasts are the most abundant cells in connective tissue and are primarily responsible for the synthesis of collagen, elastin, and other components of the extracellular matrix. (Frontiers in Bioengineering and Biotechnology, 2025) The insertion of an acupuncture needle into the dermis, typically with diameters between 0.12 mm and 0.20 mm, generates a micro-injury response that activates the tissue repair cascade,

including the migration of fibroblasts to the site of injury, the secretion of growth factors (TGF- β , PDGF, bFGF) and the production of new type I collagen. (Aust et al., 2008)

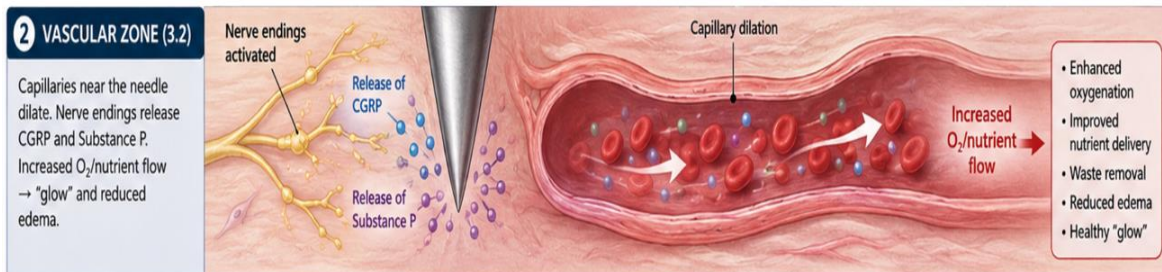
Unlike microneedling, which acts only at the skin level, AFC goes further: it also acts on the muscles and internal balance, in accordance with Traditional Chinese Medicine.'



Recent mechanistic studies have also shown that the mechanical forces generated by the rotation of the acupuncture needle are transmitted via the network of collagen fibres to peripheral fibroblasts, activating mechanosensory and triggering cytoskeletal reorganisation and extracellular matrix remodelling within a radius extending beyond the immediate insertion site. (Frontiers in Bioengineering and Biotechnology, 2025) This mechanotransduction mechanism provides a solid biological basis for the effects observed in clinical studies.

3.2 Improvement in local microcirculation

The insertion of needles into the face promotes local vasodilation and improved microcirculation, with a consequent increase in the supply of oxygen and nutrients to the dermal tissues and accelerated elimination of metabolites. (Narasimman & Sankar, 2024) This vasomotor effect is mediated by the local release of vasoactive neuropeptides, including calcitonin gene-related peptide (CGRP) and substance P, and by the activation of the somato-autonomic reflex. (Cheng, 2025) Improved local perfusion contributes to skin radiance, reduces lymphatic oedema, and supports epidermal cell renewal processes.



3.3 Muscle tone and lifting effect

The insertion of needles into the motor points of the facial muscles aims to restore the balance between the facial elevating and depressing muscles, with a direct impact on facial contours and the reduction of soft tissue ptosis. (Barrett, 2005) Unlike botulinum toxin, which produces muscle relaxation by blocking the neuromuscular junction, AFC acts to restore tonic balance rather than causing muscle paralysis. The improvement in facial contour and cheek elevation observed in AFC studies using magnetic resonance imaging is consistent with changes in the volume and tone of the masseter muscle and adjacent facial muscles. (Aesthetic Surgery Journal Open Forum, 2024)

3.4 Neuroendocrine modulation and aquaporins

Additional proposed mechanisms include the modulation of vasopressin levels, with an impact on skin water retention, and the activation of aquaporins-3 (AQP3), transmembrane proteins responsible for the transport of water and glycerol in the stratum corneum that regulate epidermal hydration. (Narasimman & Sankar, 2024) The improved lymphatic drainage resulting from acupuncture also contributes to the reduction of facial oedema and periorbital puffiness, effects frequently reported by patients in clinical practice.

4. CLINICAL EVIDENCE: RESULTS OF AVAILABLE STUDIES

4.1 Skin elasticity

The landmark study in this field is the pilot study by Yun et al. (2013), conducted at Kyung Hee University Hospital in South Korea. Twenty-eight women aged between 40 and 59 years, with grade III photoaging on the Glogau scale, received five sessions of AFC over a three-week period. The primary outcome was assessed using Moiré topography, and a statistically significant improvement was observed in the topography criteria (from 1.70 ± 0.724 to 2.26 ± 1.059 , $p < 0.0001$), with 55% of participants showing an improvement of at least one level. The most common adverse effect was mild bruising at the insertion site. The authors concluded that AFC showed promising results for facial elasticity, highlighting the need for larger controlled trials. (Yun et al., 2013) A systematic review by Lee et al. (2018) identified seven prospective studies on acupuncture for cosmetic purposes, involving 216 participants. All seven studies reported positive results for at least one outcome, including overall efficacy rate, wrinkle count and area, facial blood circulation, reduction in facial size, assessment of ageing using the elasticity scale, and

skin water and lipid content. However, the same review identified statistical flaws in six of the seven studies and a lack of information on the acupuncturists' training in all of them, which significantly limits the quality of the aggregated evidence. (Lee et al., 2018)

4.2 Skin hydration and balance

A 2024 study analysed the effect of AFC on skin hydration in young women. Participants who underwent AFC improved hydration and reduced lipid content, and they themselves felt visible improvements in their skin. Narasimman & Sankar (2024) assessed the effect of AFC on skin hydration and lipid content in women aged between 20 and 35, using a facial skin analyser. The AFC group showed significant improvements in hydration compared to the control group, with higher water content and lower lipid content. Subjective assessments confirmed these results, with participants reporting moderate to significant improvements in skin appearance. The mechanisms proposed by the authors included increased collagen synthesis, vasopressin modulation, improved lymphatic drainage, and activation of aquaporins-3. (Narasimman & Sankar, 2024)

4.3 Wrinkles, nasolabial folds, and marionette lines

Cho et al. (2015) evaluated the effect of Jae-Seng acupuncture on the improvement of nasolabial folds and periocular wrinkles in a prospective study, observing statistically significant reductions in the length of the right and left nasolabial folds and ocular wrinkles across all age groups assessed. (Cho et al., 2015) A retrospective study by Cheng et al. (2024) evaluated the efficacy of two distinct acupuncture techniques in the treatment of nasolabial folds and marionette lines in one hundred participants. The technique combined with scalpel-needle produced more significant and long-lasting results than conventional acupuncture, with good tolerability and minimal recovery time. No serious adverse events or infections were reported in either group. (Cheng et al., 2024) A randomised clinical trial by Haghiri et al. (2024), conducted in Iran with a two-arm design and a waiting list as the control, evaluated the effects of facial and body acupuncture on the reduction of glabellar wrinkles in women aged between 30 and 59 years. This study represents one of the few RCTs with a parallel control group available in this area. (Haghiri et al., 2024)

4.4 Thread-embedded acupuncture

Yun & Choi (2017) conducted a single-arm prospective study involving fourteen female participants with grade III–IV photoaging who received a single session of PDO thread-lifting acupuncture. For the primary outcome, both jaws showed an increase in vertical height of 1.87 mm on the left and 1.43 mm on the right. The distances of the melolabial and nasolabial folds showed significant improvement. On the Alexiades-Armenakas laxity scale, assessors recorded improvements of 0.5 grades. On the global aesthetic improvement scale, improvement was classified as grade 1 and 2 in nine and five cases, respectively. The most common adverse effects were mild bruising, swelling and pain, all of which resolved spontaneously. The authors concluded that thread-embedded acupuncture demonstrated clinical potential for wrinkles and facial laxity, reiterating the need for larger-scale trials. (Yun & Choi, 2017)

5. COMPARISON WITH CONVENTIONAL AESTHETIC MEDICINE TREATMENTS

5.1 Botulinum toxin

Botulinum toxin type A works by blocking the neuromuscular junction, inhibiting the release of acetylcholine, and producing temporary muscle relaxation. Its effects are rapid and predictable for dynamic wrinkles, particularly glabellar lines, forehead lines, and periorcular wrinkles. However, the effects are temporary, lasting on average three to six months, and require periodic reapplication. Prolonged use is associated with documented progressive muscle atrophy. (Alam et al., 2020) AFC is distinguished by acting to restore tonic balance rather than causing muscle paralysis, and by simultaneously stimulating collagen synthesis, improving microcirculation, and increasing epidermal hydration, addressing multiple dimensions of skin ageing in a single protocol. (Barrett, 2005; Narasimman & Sankar, 2024)

5.2 Dermal fillers

Hyaluronic acid fillers and other volumizing agents work by restoring volume and mechanically reducing wrinkles and folds. They are effective for deep nasolabial folds, marionette lines, and loss of facial volume, but are associated with risks of granulomas, nodules and, in rare cases, vascular occlusion. (Cheng et al., 2024) Direct comparison with AFC is hampered by the absence of head-to-head randomised clinical trials. The retrospective study by Cheng et al. (2024) demonstrated that scalpel-needle acupuncture produced more significant and long-lasting results in the treatment of nasolabial folds and marionette lines than conventional acupuncture, with a favourable safety profile in both groups, but did not compare directly with fillers.

5.3 Microneedling

Microneedling shares with AFC the mechanism of controlled microtrauma as a trigger for collagen synthesis. The main difference lies in the fact that microneedling acts exclusively through dermal mechanical stimulation, whilst AFC adds the selection of points according to meridian theory, the stimulation of muscle motor points affecting facial tone, and systemic effects mediated by the autonomic nervous system and the neuroendocrine axis. (Narasimman & Sankar, 2024; Frontiers in Bioengineering and Biotechnology, 2025) Microneedling has a more robust evidence base for specific cosmetic applications such as the treatment of acne scars and stretch marks. AFC, on the other hand, offers a broader therapeutic scope, simultaneously addressing the skin, musculature, and systemic condition.

6. SAFETY AND DOCUMENTED ADVERSE EFFECTS

The safety profile of AFC is consistently favourable in the available studies. The systematic review by Lee et al. (2018) identified four studies that reported adverse effects, all of which were mild in nature: pruritus, dry desquamation, ecchymosis, minor haemorrhage, pain, and transient oedema at the insertion site. No study reported serious adverse effects, systemic infections, or permanent complications. (Lee et al., 2018) The

study by Yun & Choi (2017) on thread embedding acupuncture reported ecchymosis, oedema and pain as the most common adverse effects, all mild to moderate intensity and resolving spontaneously. The study by Cheng et al. (2024) recorded mild to moderate ecchymosis in a subgroup of participants, with no cases of nodules, granulomas, persistent oedema, or haematomas. The absence of serious complications is consistent with the general safety profile of acupuncture recognised in the literature. (Frontiers in Bioengineering and Biotechnology, 2025) The most frequently described relative contraindications include coagulopathies or anticoagulant therapy, recent treatment with botulinum toxin, a tendency to keloid formation, pregnancy, and the presence of metallic implants in the treatment area. (Yun et al., 2013)

7. DISCUSSION

This review allows us to draw relevant conclusions regarding both the clinical potential of cosmetic facial acupuncture and its current evident limitations.

Firstly, the proposed mechanisms of action for CFA are biologically plausible and supported by recent basic research. The activation of dermal fibroblasts via mechanotransduction, with consequent collagen synthesis; local vasodilation and improved microcirculation; and the rebalancing of facial muscle tone constitute a coherent pathophysiological basis for the observed clinical effects. (Frontiers in Bioengineering and Biotechnology, 2025; Narasimman & Sankar, 2024) This convergence between the theoretical model of TCM and the mechanisms identified by evidence-based medicine is one of the most significant factors in establishing the scientific credibility of AFC.

Secondly, the available clinical studies consistently report positive results for outcomes such as elasticity, hydration, muscle tone, and wrinkle reduction. Nevertheless, the methodological quality of the evidence is mostly low to moderate. The systematic review by Lee et al. (2018) identified statistical flaws in six of the seven studies analysed, and the total number of participants across all published studies did not exceed four hundred individuals. These data do not invalidate the results obtained, but they prevent definitive conclusions and the formulation of formal clinical recommendations.

Thirdly, AFC takes a distinct approach compared to conventional aesthetic medicine treatments. Whilst botulinum toxin and dermal fillers act locally on wrinkles or volume in isolation, AFC simultaneously addresses the skin, Suggestion: 'Existing studies are consistent in their results; the skin improves in terms of elasticity, hydration, and wrinkles. But also, the quality of the musculature and the patient's systemic condition, from an integrative perspective that is consistent with the holistic view of TCM. This multidimensional approach represents a significant conceptual and potentially clinical advantage but lacks validation in direct comparative studies.

The methodological limitations of the existing literature are widespread and well-recognised: the absence of parallel control groups in most studies; the difficulty in establishing credible controls, given the nature of the needle-based intervention; heterogeneity of treatment protocols in terms of points used, frequency and number of

sessions; lack of long-term follow-up; and a predominance of small-scale studies conducted in Asian settings, which limits the generalisability of the results to other populations.

8. CONCLUSION

Cosmetic facial acupuncture is a non-invasive approach with biologically plausible mechanisms of action and consistently positive preliminary clinical evidence regarding skin ageing. The available studies demonstrate measurable improvements in elasticity, hydration, muscle tone, and wrinkle reduction, with a favourable safety profile and adverse effects that are mostly mild and transient. AFC differs from conventional aesthetic medicine treatments in its systemic approach, acting simultaneously on the skin, the muscles and the body's internal condition, without the risks associated with dermal injections or prolonged muscle paralysis. This feature is particularly relevant for patients seeking gradual and sustained results, without any recovery time. However, the level of available evidence is insufficient to establish formal clinical recommendations. Larger randomised controlled trials are needed, with standardised methodologies, objective and validated outcome measures, and long-term follow-up. Priority areas for future research include multicentre trials with samples of at least one hundred participants per arm; standardisation of treatment protocols to allow comparisons between studies; histological studies confirming in vivo collagen synthesis following AFC in humans; direct comparative studies with conventional treatments; and investigation of long-term effects following completion of the treatment protocol.

The growing demand for non-invasive alternatives to skin ageing, combined with the plausibility of the identified mechanisms of action and documented safety, fully justifies investment in rigorous clinical research in this area. The integration of the principles of Traditional Chinese Medicine (TCM) with the methodology of evidence-based medicine offers a promising avenue for the development of more patient-centred and personalised treatment protocols.

Reference

- 1) ALAM, M. et al. Long-term effects of botulinum toxin on facial muscles: a clinical review. *JAMA Dermatology*, v. 156, n. 2, p. 178–184, 2020. Available at: <https://doi.org/10.1001/jamadermatol.2019.3763>. Accessed on: 15 May 2026.
- 2) AUST, M. C. et al. Percutaneous collagen induction therapy: an alternative treatment for scars, wrinkles, and skin laxity. *Plastic and Reconstructive Surgery*, v. 121, n. 4, p. 1421–1429, 2008. Available at: <https://doi.org/10.1097/01.prs.0000304612.72899.02>. Accessed on: 15 May 2026.
- 3) BARRETT, J. B. Acupuncture, and facial rejuvenation. *Aesthetic Surgery Journal*, v. 25, n. 4, p. 419–424, 2005. Available at: <https://doi.org/10.1016/j.asj.2005.05.001>. Accessed on: 15 May 2026.
- 4) CHENG, H. et al. Effectiveness of acupuncture therapy on improvement of nasolabial folds and marionette lines: a retrospective study. *Health Science Reports*, v. 7, n. 8, p. e70014, 2024. Available at: <https://doi.org/10.1002/hsr2.70014>. Accessed on: 15 May 2026.

- 5) CHENG, K. Neurobiological mechanisms of acupuncture: a clinician's perspective. *Acupuncture Vlaanderen*, 2025. Available at: <https://acupunctuur.vlaanderen/wp-content/uploads/2025/05/Cheng-Mechanisms-of-Acu-a-clinicians-perspective.pdf>. Accessed on: 15 May 2026.
- 6) CHO, J. H. et al. Effects of Jae-Seng acupuncture treatment on the improvement of nasolabial folds and eye wrinkles. *Evidence-Based Complementary and Alternative Medicine*, v. 2015, p. 273909, 2015. Available at: <https://doi.org/10.1155/2015/273909>. Accessed on: 15 May 2026.
- 7) DEADMAN, P. et al. *Manual de acupuntura: guia completo de pontos e canais*. São Paulo: Roca, 2007.
- 8) DORAN, V. C. An introduction to facial revitalisation acupuncture. *European Journal of Oriental Medicine*, v. 5, n. 5, p. 4–8, 2007.
- 9) Emergen Research. *Complementary & alternative medicine for anti-aging & longevity market analysis*. Vancouver: Emergen Research, 2024. Available at: <https://www.emergenresearch.com/industry-report/complementary-alternative-medicine-for-anti-aging-longevity-market>. Accessed on: 15 May 2026.
- 10) Frontiers In Bioengineering And Biotechnology. Fibroblasts as key cellular targets in acupuncture therapy: a mechanistic perspective. *Frontiers in Bioengineering and Biotechnology*, v. 13, p. 1662525, 2025. Available at: <https://doi.org/10.3389/fbioe.2025.1662525>. Accessed on: 15 May 2026.
- 11) GRAND VIEW RESEARCH. *Complementary and alternative medicine for anti-aging & longevity market report*. San Francisco: Grand View Research, 2024. Available at: <https://www.grandviewresearch.com/industry-analysis/complementary-alternative-medicine-anti-aging-longevity-market-report>. Accessed on: 15 May 2026.
- 12) GUPTA, M. A.; GILCHREST, B. A. Psychosocial aspects of aging skin. *Dermatologic Clinics*, v. 23, n. 4, p. 643–648, 2005. Available at: <https://doi.org/10.1016/j.det.2005.05.012>. Accessed on: 15 May 2026.
- 13) HAGHIR, H. et al. Effects of face and body acupuncture on glabellar frown lines in women aged 30–59: a study protocol for a double-arm randomized waitlist-controlled trial. *Journal of Acupuncture and Meridian Studies*, v. 17, n. 6, p. 1–8, 2024. Available at: <https://doi.org/10.1016/j.jams.2024.09.001>. Accessed on: 15 May 2026.
- 14) HAN, J. S. Acupuncture, and endorphins. *Neuroscience Letters*, v. 361, n. 1–3, p. 258–261, 2004. Available at: <https://doi.org/10.1016/j.neulet.2003.12.019>. Accessed on: 15 May 2026.
- 15) HUANG, F. F. et al. Neuroimaging evidence for central mechanisms of acupuncture in non-specific low back pain: a systematic review and meta-analysis. *Frontiers in Medicine*, v. 12, p. 1657241, 2025. Available at: <https://doi.org/10.3389/fmed.2025.1657241>. Accessed on: 15 May 2026.
- 16) HUANG, Z. et al. The efficacy and safety of acupuncture treatment for peripheral facial paralysis: an overview of systematic review and meta-analysis. *Frontiers in Neurology*, v. 16, p. 1669551, 2025. Available at: <https://doi.org/10.3389/fneur.2025.1669551>. Accessed on: 15 May 2026.
- 17) LEE, J. et al. Acupuncture for cosmetic use: a systematic review of prospective studies. *Journal of Cosmetic Medicine*, v. 2, n. 2, p. 76–85, 2018. Available at: <https://doi.org/10.25056/JCM.2018.2.2.76>. Accessed on: 15 May 2026.
- 18) LI, P.; QIU, T.; QIN, C. Efficacy of acupuncture for Bell's palsy: a systematic review and meta-analysis of randomized controlled trials. *PLoS One*, v. 10, n. 5, p. e0121880, 2015. Available at: <https://doi.org/10.1371/journal.pone.0121880>. Accessed on: 15 May 2026.
- 19) LU, G. D.; NEEDHAM, J. *Celestial lancets: a history and rationale of acupuncture and moxa*. Londres: Routledge, 2002.

- 20) NAPADOW, V. et al. Editorial: neural substrates of acupuncture: from peripheral to central nervous system mechanisms. *Frontiers in Neuroscience*, v. 13, p. 1419, 2020. Available at: <https://doi.org/10.3389/fnins.2019.01419>. Accessed on: 15 May 2026.
- 21) NARASIMMAN, P.; SANKAR, G. Cosmetic acupuncture for facial skin rejuvenation. *Indian Journal of Integrative Medicine*, 2024. Online First. Available at: <https://www.mansapublishers.com/ijim/article/download/4825/4098>. Accessed on: 15 May 2026.
- 22) NICE — National Institute for Health and Care Excellence. *Chronic pain: assessment and management* (NG193). Londres: NICE, 2021. Available at: <https://www.nice.org.uk/guidance/ng193>. Accessed on: 15 May 2026.
- 23) PAGE, M. J. et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, v. 372, p. n71, 2021. Available at: <https://doi.org/10.1136/bmj.n71>. Accessed on: 15 May 2026.
- 24) RAO, Y.; GE, L.; WU, J. A systematic review and coordinate-based meta-analysis of fMRI studies on acupuncture at LR 3. *Frontiers in Neuroscience*, v. 18, p. 1341567, 2024. Available at: <https://doi.org/10.3389/fnins.2024.1341567>. Accessed on: 15 May 2026.
- 25) SHUSTER, S.; BLACK, M. M.; MCVITIE, E. The influence of age and sex on skin thickness, skin collagen, and density. *British Journal of Dermatology*, v. 93, n. 6, p. 639–643, 1975. Available at: <https://doi.org/10.1111/j.1365-2133.1975.tb05113.x>. Accessed on: 15 May 2026.
- 26) WANG, Z. et al. Research status and trends of functional magnetic resonance imaging technology in the field of acupuncture: a bibliometric analysis over the past two decades. *Frontiers in Neuroscience*, v. 19, p. 1489049, 2025. Available at: <https://doi.org/10.3389/fnins.2025.1489049>. Accessed on: 15 May 2026.
- 27) World Health Organization. *WHO international standard terminologies on traditional Chinese medicine*. Geneva: WHO, 2019. Available at: <https://apps.who.int/iris/handle/10665/312342>. Accessed on: 15 May 2026.
- 28) YUN, Y.; CHOI, I. Effect of thread embedding acupuncture for facial wrinkles and laxity: a single-arm, prospective, open-label study. *Integrative Medicine Research*, v. 6, n. 4, p. 418–426, 2017. Available at: <https://doi.org/10.1016/j.imr.2017.09.002>. Accessed on: 15 May 2026.
- 29) YUN, Y. et al. Effect of facial cosmetic acupuncture on facial elasticity: an open-label, single-arm pilot study. *Evidence-Based Complementary and Alternative Medicine*, v. 2013, p. 424313, 2013. Available at: <https://doi.org/10.1155/2013/424313>. Accessed on: 15 May 2026.
- 30) ZHANG, J. et al. Functional magnetic resonance imaging studies of acupuncture at ST36: a coordinate-based meta-analysis. *Frontiers in Neuroscience*, v. 17, p. 1180434, 2023. Available at: <https://doi.org/10.3389/fnins.2023.1180434>. Accessed on: 15 May 2026.