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EFFETTI NEURO-FISIOLOGICI DELL'AGOPUNTURA

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ABSTRACT

L'agopuntura è una pratica medica che ha origine in tempi antichissimi, ancor precedenti all'invenzione della scrittura. Spiegata per la prima volta in Cina e qui perfezionata, questa pratica si è diffusa in tutto il mondo, attirando l'interesse di medici e ricercatori, con lo scopo di stabilire i meccanismi neurofisiologici coinvolti a seguito della stimolazione degli aghi sulla pelle e chiarire il ruolo terapeutico di una tecnica così particolare.

Diverse ricerche e studi sperimentali hanno esplorato gli effetti dell'agopuntura sull'uomo e sugli animali, con l'utilizzo di tecniche valutative di neuro imaging ed elettroencefalografia. L'infissione e la manipolazione degli aghi, agendo sul tessuto connettivo, attivano la corteccia somatosensoriale ed innescano le vie neuronali del dolore, con la successiva modulazione dell'asse ipotalamo-ipofisi-surrene, responsabile della produzione e del rilascio di sostanze con proprietà sedative sul dolore stesso, come le endorfine, e dell'abbassamento dei livelli di cortisolo, con la conseguente attenuazione dello stato di stress.

I meccanismi alla base del funzionamento neuro-fisiologico dell'agopuntura, seguono le vie del dolore. L'azione dolorosa di uno stimolo esterno, in questo caso l'infissione e la manipolazione degli aghi nei diversi strati della pelle, provoca un'alterazione del tessuto che attiva particolari recettori presenti nelle terminazioni nervose libere, disseminate sulla superficie del corpo (ma anche in tessuti più profondi e attorno agli organi interni), ovvero i nocicettori. Il potenziale

d'azione generato a livello periferico risale le vie ascendenti, entrando nel midollo spinale per poi arrivare al cervello, dove l'informazione dolorifica viene elaborata nelle sue componenti cognitive ed emozionali. Da qui partono due tipi di fibre nervose discendenti coinvolte nella percezione del dolore: le fibre delta, mielinizzate, per il dolore acuto e localizzato, e le fibre C, sprovviste di mielina, per il dolore cronico e non localizzato precisamente.

Dagli studi emerge che il trattamento di agopuntura, oltre ad offrire un risultato di generale rilassamento del corpo agendo sulla muscolatura, partecipa alla regolazione dei livelli di serotonina e noradrenalina nel cervello, i principali neurotrasmettitori coinvolti nelle psicopatologie ansioso-depressive.

Sebbene le prove scientifiche non offrano dati univoci e i risultati relativi al trattamento di agopuntura varino sensibilmente di paziente in paziente, l'agopuntura può essere considerata una strategia utile per la cura di molti dolori articolatori e per le patologie da disfunzioni ormonali, oltre a rappresentare un'efficace pratica terapeutica integrativa per il miglioramento dei sintomi correlati ad ansia e depressione, da associare ai metodi di cura standard.

L'agopuntura, come tutte le pratiche terapeutiche della medicina tradizionale cinese, è stata da sempre utilizzata con lo scopo di adattarsi alle condizioni 'energetiche' del singolo paziente, per ripristinare o mantenere lo stato di benessere, anche in ottica preventiva; i percorsi diagnostici, sistematici

e specifici, offrono una mappatura dettagliata e completa dello stato interno del paziente, aiutando il medico a localizzare lo squilibrio d'energia e suggerendo la strategia di cura migliore da attuare. Più in generale si può affermare che l'agopuntura è in grado di ristabilire l'equilibrio psico-fisico dell'uomo, un concetto già espresso dagli antichi testi di arte medica cinese, già migliaia di anni fa.

BIBLIOGRAFIA

Acupuncture anaesthesia. Beijing: Foreign Languages Press, 1973

Acupuncture (PDQ®). Health Professional Version. PDQ Integrative, Alternative, and Complementary Therapies Editorial Board, Published online, July 31, 2018

Adler L. et al., Attention-deficit/hyperactivity disorder in adult patients with posttraumatic stress disorder (PTSD): is ADHD a vulnerability factor? *J Atten Disord* 8, 11–16 (2004)

Andrews G. et al., Utilising survey data to inform public policy: comparison of the cost-effectiveness of treatment of ten mental disorders, *Br J Psychiatry*, 2004, 184(6):526-33

Athinoula A., Martinos Center for Biomedical Imaging, Department of Radiology, Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA

Battle D. E., Diagnostic and Statistical Manual of Mental Disorders (DSM), *Codas* 25, 191–192 (2013)

Blackway J., What type are you? The 5 elements

Bonica J. J., Therapeutic acupuncture in the People's Republic of China. Implications for American medicine, *JAMA* 1974; 228(12):1544-51

Borzecki M. et al., Assessment of acupuncture as a method of analgesia during operation. *Anaesth Resusc Intensive Ther* 1976, 4(1):53-60

Boschi G., *Medicina cinese: la radice e i fiori*, CEA 2003

British acupuncture council: History of acupuncture. Public content

Carlson N., *Fisiologia del comportamento*, Piccin Nuova Libreria, Padova, 2014

Carlsson C., Acupuncture mechanisms for clinically relevant long-term effects – reconsideration and a hypothesis, *Acupunct Med.*, 2002, Aug; 20(2-3):82-99

Chae Y. et al., Psychophysical and neurophysiological responses to acupuncture stimulation to incorporated rubber hand. *Neurosci Lett.* 2015 Mar 30; 591:48-52. doi: 10.1016/j.neulet.2015.02.025. Epub 2015 Feb 11

Chen L. et al. A survey of selected physician views on acupuncture in pain management, *Pain Med* 2010; 11:530–534

Choi DH. et al., Patterns of complementary and alternative medicine therapies in patients with chronic fatigue or pain, *Korean J Farm Med.*, 2009; 30:182–9. doi: 10.4082/kjfm.2009.30.3.182

Choi KE et al., Isolated and combined effects of electroacupuncture and meditation in reducing experimentally induced ischemic pain: a pilot study. *Evid Based Complement Altern Med* 2011;2011

Corbellini C., *Agopuntura: una terapia antica per l'uomo post-moderno*, Tecniche Nuove, 2003

Cui L. et al., MiRNAs are involved in chronic electroacupuncture tolerance in the rat hypothalamus, *Mol Neurobiol.* 2017;54(2):1429–39.

B. de Rachewiltz. *Universo del corpo*, *Agopuntura* (1999), Articolo da enciclopedie Treccani

Dhond RP et al., Spatiotemporal mapping the neural correlates of acupuncture with MEG. *J Altern Complement Med* 2008 Jul;14(6):679-88

Einarson A. et al., Abrupt discontinuation of psychotropic drugs during pregnancy: fear of teratogenic risk and impact of counselling. *J Psychiatry Neurosci*, 2001;26(1):44–8

Eckert A., Manuale pratico di medicina cinese. Il potere dei cinque elementi, Hermes Edizioni, Roma, 1996

Fais R. S., Reis G. M. et al., Amitriptyline converts non-responders into responders to low-frequency electroacupuncture-induced analgesia in rats, *Life Sci* 2012;91(1-2):14-19. doi: 10.1016/j.lfs.2012.05.009

Faubert A., Introduzione ai principi della agopuntura tradizionale cinese. La bioenergetica degli esseri viventi, Red Edizioni, 1995

Fibromyalgia: overview, Mayo Clinic

Fukuda K. et al., The chronic fatigue syndrome: a comprehensive approach to its definition and study. International Chronic Fatigue Syndrome Study Group, *Ann Intern Med*, 1994;121:953-9. doi: 10.7326/0003-4819-121-12-199412150-00009

Graziottin A., I disturbi dell'umore nella donna. Articolo del 01/07/2005

Haake M. et al., German Acupuncture Trials (GERAC) for chronic low back pain: randomized, multicenter, blinded, parallel-group trial with 3 groups, *Arch Intern Med* 2007;167(17):1892-8. Erratum in: *Arch Intern Med* 2007;167(19):2072,

Hahm T. S., The effect of 2 Hz and 100 Hz electrical stimulation of acupoint on ankle sprain in rats, *J Korean Med Sci* 2007; 22(2): 347-351

Han J. S. et al., Is cholecystokinin octapeptide (CCK-8) a candidate for endogenous anti-opioid substrates? *Neuropeptides*. 1985;5(4-6):399-402. doi: 10.1016/0143-4179(85)90038-1 [PubMed]

Han J. S., Acupuncture: neuropeptide release produced by electrical stimulation of different frequencies, *Trends Neurosci*, 2003;26(1):17-22. doi: 10.1016/S0166-2236(02)00006-1

Hayhoe S., Single-use acupuncture needles: scanning electron-microscopy of needle-tips. Articolo del 2000

Hori E. et al., Effects of acupuncture on the brain hemodynamics, *Auton Neurosci*, 2010 Oct 28;157(1-2):74-80. doi: 10.1016/j.autneu.2010.06.007

Harrington K. M. et al., Attention-deficit/hyperactivity disorder comorbidity in a sample of veterans with posttraumatic stress disorder. *Compr Psychiatry* 53, 679–690 (2012)

Hicks A., Five elements constitutional acupuncture. E-book. Elsevier Health Sciences, 2010

Hirsch D. Jing Mai, Masunaga e punti shu antichi. Articolo da *DBN Magazine*

Huang T. et al., The influence of different acupuncture manipulations on the skin temperature of an acupoint, *Evid Based Complement Alternat Med* 2013; 2013: 905852

Huang T. et al., A transcontinental pilot study for acupuncture lifting-thrusting and twisting-rotating manipulations. *Evid Based Complement Alternat Med* 2012; 2012: 157989

Huang T. et al., The influence of different acupuncture manipulations on the skin temperature of an acupoint. *Evid Based Complement Alternat Med* 2013, 2013: 905852

Huang W. et al., Characterizing acupuncture stimuli using brain imaging with fMRI—a systematic review and meta-analysis of the literature, *PLoS One* 2012, 7:e32960

Huo Z. J. et al., Effects of acupuncture with meridian acupoints and three Anmian acupoints on insomnia and related depression and anxiety state.

Chinese journal of integrative medicine 19, 187–191 (2013)

Istituto di Neuroscienze e bioimmagine. Misurata per la prima volta l'efficacia dell'agopuntura. Comunicato stampa N. 77/2001 Roma, 16 luglio 2001

Jung-Eun K. et al., Acupuncture for chronic fatigue syndrome and idiopathic chronic fatigue: a multicenter, nonblinded, randomized controlled trial. *Trials*. 2015, 16: 314. Published online 2015 Jul 26. doi: 10.1186/s13063-015-0857-0

Ji S. M., Yan L., Mechanisms about the effect of different acupuncture manipulation methods on body temperature. *Zhong Guo Zhen Jiu* 2007, 27(4): 306-308

Kaada B. et al., Acupuncture analgesia in the People's Republic of China, Report from a Norwegian medical study group. *Tidsskr Nor Laegeforen* 1974, 94(7):417-42

Kuai L. et al., Fuzzy cluster analysis of therapeutic effects of electro-acupuncture at different parameters. *Zhong Xi Yi Jie He Xue Bao* 2009, 7(5): 478-481

Langevin H. M., A new method for quantifying the needling component of acupuncture treatments, *Acupunctmed*, 2012

Lavier J., Storia, dottrina e pratica dell'agopuntura cinese. Edizioni mediterranee, Roma, 1973

Le K. et al., Comparison of analgesic effects of electroacupuncture with multi-factor quantitative parameters on inflammatory pain in rats, *Zhong Guo Zhen Jiu* 2008, 28(11): 829-832

Lee J.-S. et al., Effects of Naegwan-Acupuncture (PC6) on the change of standard leads I, II and III in ECG. *Te Korean Journal of Meridian &*

Acupoint (2004)

Li K. et al., The effects of acupuncture treatment on the right frontoparietal network in migraine without aura patients. *J Headache Pain*. 2015, 16:518

Li P. et al., Inhibitory effect of electroacupuncture (EA) on the pressor response induced by exercise stress, *Clin Auton Res*. 2004, 14(3):182–188. doi: 10.1007/s10286-004-0175-1

Li S. et al., Effectiveness of acupuncture in postpartum depression: a systematic review and meta-analysis, *Acupunct Med.*, 2018 Jun 15

Lie J. et al., Neuronal specificity of needling acupoints at same meridian: a control functional magnetic resonance imaging study with electroacupuncture. *Acupunct Electrother Res* 2007, 32(3-4):179-93. Department of Radiology, Huashan Hospital, Shanghai, China

Lim T. K. et al., Acupuncture and neural mechanism in the management of low back pain-An Update. *Medicines (Basel)* 2018 Jun 25, 5(3). Pii: E63. Doi: 10.3390/medicines5030063

Liu F. et al., Characteristics of Induced by Needling Zusanli (ST 36) in 527 Healthy Volunteers with Different Constitutions, *Zhen Ci Yan Jiu* 2016 Dec, 41(6):535-9. Hanzhong City Central Hospital, Hanzhong 723000

Liu YL. et al., Feishu acupuncture inhibits acetylcholine synthesis and restores muscarinic acetylcholine receptor M2 expression in the lung when treating allergic asthma. *Inflammation*. 2018 Jun, 41(3):741-750

Liu SX et al. Relationship between the analgesic effect of electroacupuncture and CCK-8 content in spinal perfusate in rats. *Chin Sci Bull*. 1999, 44(3):240–243. doi: 10.1007/BF02896283

Liu TY et al., Classification and characters of physical parameters of lifting-thrusting and twirling manipulations of acupuncture. *Zhen Ci Yan Jiu* 2010,

35(1): 61-66

Lundeberg T., Are minimal, superficial or sham acupuncture procedures acceptable as inert placebo controls? *Acupunct Med*, 2006, 24(1):13-5

Lundeberg T. et al., Acupuncture-selfappraisal and the reward system, *Acupunct Med* 2007, 25(3):87-99

Lundeberg T. et al., The Emperor's sham – wrong assumption that sham needling is sham, *Acupuncture in medicine*, 2008, 26(4):239-242

Ma L. X. et al., A comparative study on effects of electroacupuncture with different stimulation parameters on medicine induced abortion, *Zhong Guo Zhen Jiu* 2008; 28(7): 477-480

Macdonald A. J. et al., Superficial acupuncture in the relief of chronic low back pain. *Ann R Coll Surg Engl* 1983, 65(1):44-6

MacPherson H. et al. Brain imaging of acupuncture: comparing superficial with deep needling, *Neurosci Lett*, 2008 Mar 21, 434(1):144-9

Manber R. et al., Acupuncture: a promising treatment for depression during pregnancy, *J Affect Disord*, 2004, 83(1):89–95; 2004/11/15

Manber R. et al., Acupuncture for Depression During Pregnancy: A Randomized Controlled Trial *Obstetrics & Gynecology*, 115(3):511-520, mar 2010

Mayer D. J., Biological mechanisms of acupuncture, *Prog Brain Res* 122: 457-77, 2000

Martin D. P. et al., Improvement in fibromyalgia symptoms with acupuncture: results of a randomized controlled trial, *Mayo clinic proceedings*. Volume 81, Iussue 6, June2007, page 749-757

Melchart D. et al., Treatment of patients with chronic headaches in a

hospital for traditional Chinese medicine in Germany. A randomised, waiting list controlled trial. *Complement Ther Med* 2004, 12(2-3):71-8

Midrio M., *Compendio di fisiologia umana*. Piccin Nuova Libreria, Padova, 2012

Milgrom J., Depression in pregnancy and the postpartum period, *InPsych* 2017, 39(1):20-1

Musial F. et al., The effect of electroacupuncture and tramadol on experimental tourniquet pain, *Acupunct Med* 2012, 30:21-26

NIH Consensus Conference. Acupuncture. *JAMA* 280 (17): 1518-24, 1998

Nixon E. et al. Characterization of the 'deqi' response in acupuncture. *BMC Complement Altern Med* 2007 Oct 31, 7:33, Epub 2007, Oct 31

Nordqvist C., How does acupuncture work? Articolo dicembre 2017

Ohara P. T. et al. Cortical modulation of pain, *Cell Mol Life Sci* 2005, 62:44-52

Olausson H. et al., Unmyelinated tactile afferents signal touch and project to insular cortex. *Nat Neurosci* 2002, 5(9):900-4

Park H. J. et al., The association between the DRD2 TaqI a polymorphism and smoking cessation in response to acupuncture in Koreans. *J Altern Complement Med*. 2005, 11(3):401-5

Poznanski A. et al., Differences in central neural pain processing following acupuncture and sham acupuncture therapy in fibromyalgia (FM). American Pain Society's 27th Annual Scientific Meeting (May 8-10, 2008) Abstract 8290

Robinson N. G., *Interactive Medical Acupuncture Anatomy*, Trenton NewMedia

Rosetti T., I meridiani nella medicina tradizionale cinese. Articolo del 2016.

Scholz J. et al. Can we conquer pain? *Nat Neurosci*, 2002, 5(Suppl):1062–1067. doi: 10.1038/nn942

Seem D. M., PH.D., Acupuncture. *Physical Medicine: an acupuncture touchpoint approach to the treatment of: cronic fatigue, pain and stress disorder*, Blue Poppy Press, 2000

Sekido R. et al., Differences of electroacupuncture-induced analgesic effect in normal and inflammatory conditions in rats, *Am J Chin Med*, 2003, 31(6):955–965. doi: 10.1142/S0192415X03001491

Silva J. R. et al., Analgesia induced by 2- or 100-Hz electroacupuncture in the rat tail-flick test depends on the activation of different descending pain inhibitory mechanisms, *J Pain* 2011; 12(1): 51-60

Smith C. A. et al., Acupuncture for depression, Articolo pubblicato il 4 marzo 2018 su www.cochrane.org

So E. W. et al., A randomized double blind comparison of real and placebo acupuncture in IVF treatment, *Hum Reprod*, Epub 2008 Oct 21

Sotte L. et al., *Agopuntura cinese. Trattato di agopuntura e medicina cinese*, Casa Editrice Ambrosiana, 2007

Sotte L. et al., *Agopuntura. L'antica scienza cinese della salute*, Fenice 2000, Milano, 1995

Stoppler M. D., How does acupuncture work? Benefits, needles, definition, Articolo del 2017

Suvow S., The history of acupuncture, Articolo del 2018

Synovitz L., *Complementary and alternative medicine for health professionals*, Jones and Bartlett Publishers, 2012

Takehige C. et al., The acupuncture point and its connecting central pathway for producing acupuncture analgesia. *Brain Res Bull.* 1993, 30(1-2):53-67

Takehige C. et al., Positive feedback action of pituitary beta-endorphin on acupuncture analgesia afferent pathway. *Brain Res Bull.* 1992, 29(1):37-44. doi: 10.1016/0361-9230(92)90006-J.

Tang N. M. et al., Cholecystokinin antisense RNA increases the analgesic effect induced by electroacupuncture or low dose morphine: conversion of low responder rats into high responders, *Pain*, 1997, 71(1):71-80. doi: 10.1016/S0304-3959(97)03341-1

Theysohn N. et al., Acupuncture-Related Modulation of Pain-Associated Brain Networks During Electrical Pain Stimulation: A Functional Magnetic Resonance Imaging Study. *J Altern Complement Med.* 2014 Dec 1, 20(12): 893-900

Tian J. H. et al., Endogenous orphanin FQ: evidence for a role in the modulation of electroacupuncture analgesia and the development of tolerance to analgesia produced by morphine and electroacupuncture, *Br J Pharmacol*, 1998;124(1):21-26. doi: 10.1038/sj.bjp.0701788 [PMC free article]

Treccani, *Agopuntura enciclopedia on-line.*

Veith I., *Testo Classico di Medicina Interna dell'Imperatore Giallo*, Edizioni mediterranee, 2006

Wang C. C. et al., Effectiveness of acupuncture as an adjunct treatment for women with postnatal depression: a systematic review protocol

Wang C. H. et al., Study on twirling reinforcing-reducing manipulation based on the parameter figure of the acupuncture manipulation apparatus. *Zhong Guo Zhen Jiu* 2009; 29(9): 723-725

Wang J. J. et al., Thinking about the conclusion of no difference between the acupuncture and sham-acupuncture in the clinically therapeutic effects on migraine abroad. *Zhongguo Zhen Jiu*. 2009 apr, 29(4):315-9

Wang K. et al., Transcriptomics study on the transcriptional response of the spinal dorsal horn to electroacupuncture stimulation with different frequencies. *Zhong Guo Zhong Xi Yi Jie He Za Zhi* 2012, 32(11): 1580-1511, 1515

Wang L. C. et al., Comparative study on effects of different acupuncture manipulation methods at Neiguan on hand spasm in the patient of stroke. *Zhong Guo Zhen Jiu* 2008, 28(7): 503-506

Wang X. M., Lifting-thrusting and rotating manipulations: a comparison on energy input. *Zhong Guo Zhen Jiu* 2011; 31(1): 71-74. Riferimenti:

Wen Q. et al. Effects of acupuncture and moxibustion at different times on the nausea and vomiting induced with chemotherapy: a self cross control study. *Zhongguo Zhen Jiu*. 2018 Jul 12, 38(7):690-4

Wu, J. et al., Acupuncture for depression: a review of clinical applications. *Can J Psychiatry* 57, 397-405 (2012).

Yang B. et al., Efficacy of acupuncture on fibromyalgia syndrome: a meta-analysis. *J Tradit Chin Med*. 2014 Aug, 34(4):381-91

Yang Xu, Yang Guo et al., A new theory of acupuncture: promoting robust regulation, *Journal of acupuncture and meridian studies*, Articolo del 2018

Yao W. P. et al., Effects of different frequencies of electro-acupuncture at Shuigou (GV 26) on recovery of motor function in rats with focal cerebral ischemic injury, *J Tradit Chin Med* 2012; 32(1): 99-104

Yoon D. et al., The Effect of Electroacupuncture at Sobu (HT8) on the EEG and HRV. *Korean Journal of Acupuncture*, 2013

Young O. H. et al., Acupuncture modulates stress response by the mTOR signaling pathway in a rat post-traumatic stress disorder model. Scientific Reports volume 8, Article number: 11864, 2018

Yu-Kang K. et al., What intrinsic factors influence responsiveness to acupuncture in pain?: a review of pre-clinical studies that used responder analysis. BMC Complement Altern Med. 2017; 17: 281. Published online 2017 May 25. doi: 10.118

Yuan H. W. et al., Influence of electroacupuncture stimulation at delivery-facilitating acupoints with different stimulating parameters on serum endocrine hormones of late-stage pregnant rats. Zhen Ci Yan Jiu 2013, 38(2): 112-117

Zang L. et al., Electro-acupuncture improves psychiatric symptoms, anxiety and depression in methamphetamine addicts during abstinence: A randomized controlled trial. Article in Medicine 97(34):e11905 · August 2018

Zeng Y. et al., Different manual manipulations and electrical parameters exert different therapeutic effects of acupuncture. Journal of Traditional Chinese Medicine, 2014 December 15, 34(6): 754-758

Zhang H. et al., Effects of puncturing Zusanli (ST 36) by lifting - thrusting and rotating techniques on electrogastrogram and plasma levels of Gastrin, cAMP and cGMP in Newzealand Rabbits. Guang Zhou Zhong Yi Yao Da Xue Xue Bao 2012; 19(2): 112-114

Zhang Q., Progress of fMRI Research on Acupuncture and Our Considerations About Further Studies. Zhen Ci Yan Jiu 2018 May,43(5):330-4. Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, China

Zhang W. T., Evidence from brain imaging with fMRI supporting functional

specificity of acupoints in humans. *Neurosci Lett* 2004 Jan, 354(1):50-3.
Neuroscience Research Institute, Peking University, 38 Xue Yuan Rd,
Beijing 100083, China

Zijlstra F. J., van den Berg-de Lange I, Huygen FJ, et al.: Anti-inflammatory actions of acupuncture. *Mediators Inflamm* 12 (2): 59-69, 2003

SITI WEB

www.acupuncture.org.uk

www.alessandragraziottin.it

www.mayoclinic.org

www.medicalnewstoday.com

www.medicinenet.com

www.treccani.it

www.usa.gov

www.who.int