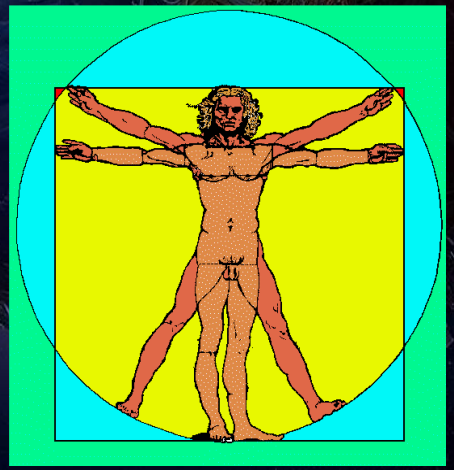
ASSOCIAZIONE ITALIANA PER LA RICERCA E L'AGGIORNAMENTO SCIENTIFICO

A.I.R.A.S

AGOPUNTURA E STRESS OSSIDATIVO

FRANCESCO CECCHERELLI

FISA
Federazione Italiana
delle Società di Agopuntura



ICMART

DEFINIZIONE DI ANTIOSSIDANTE

SOSTANZA CAPACE DI IMPEDIRE O RALLENTARE L'OSSIDAZIONE DI PRODOTTI FACILMENTE OSSIDABILI E QUINDI ALTERABILI, COME I PRODOTTI ALIMENTARI E FARMACEUTICI, LE PLASTICHE ED I COSMETICI.

"ENZIMI O MOLECOLE PIÙ SEMPLICI IN GRADO DI CONTRASTARE L'AZIONE LESIVA DEI RADICALI LIBERI CONTENENTI OSSIGENO, E DI ESERCITARE PERTANTO UN'AZIONE PROTETTIVA SULL'INTEGRITÀ CELLULARE.
SI DISTINGUONO IN PRIMARI, O PREVENTIVI, LA CUI FUNZIONE È QUELLA DI IMPEDIRE O RITARDARE L'OSSIDAZIONE TRAMITE RIMOZIONE O INIBIZIONE DELL'AGENTE OSSIDANTE, E SECONDARI, LA CUI FUNZIONE È: INTERROMPERE L'OSSIDAZIONE UNA VOLTA INIZIATA"

VOCABOLARIO TRECCANI

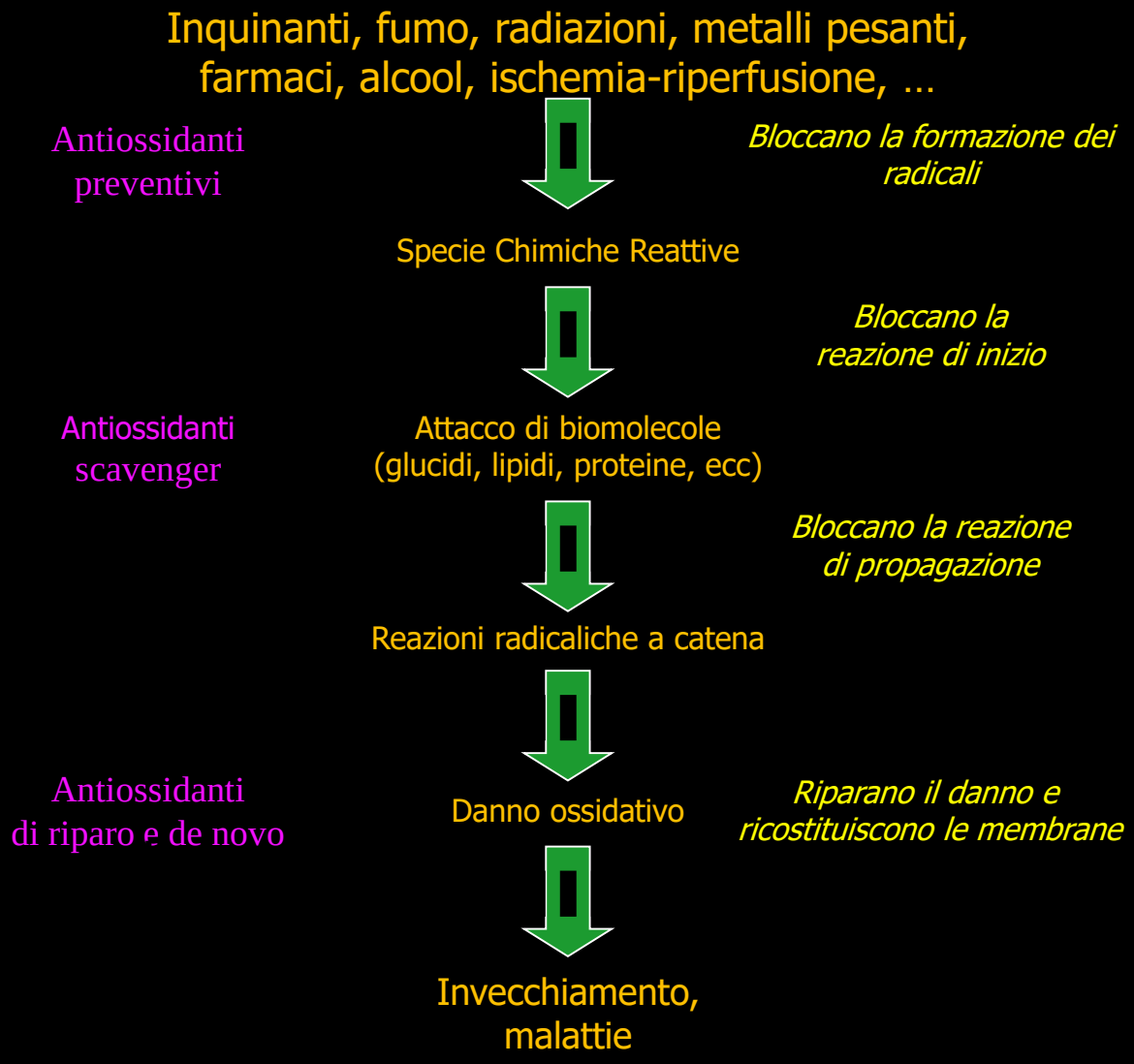
REAZIONI DI RADICALI LIBERI

INIZIO formazione di radicali liberi

PROPAGAZIONE i radicali liberi reagiscono con altre molecole per produrre altri radicali liberi

TERMINAZIONE i radicali liberi reagiscono tra loro per formare molecole

Meccanismo d'azione degli antiossidanti



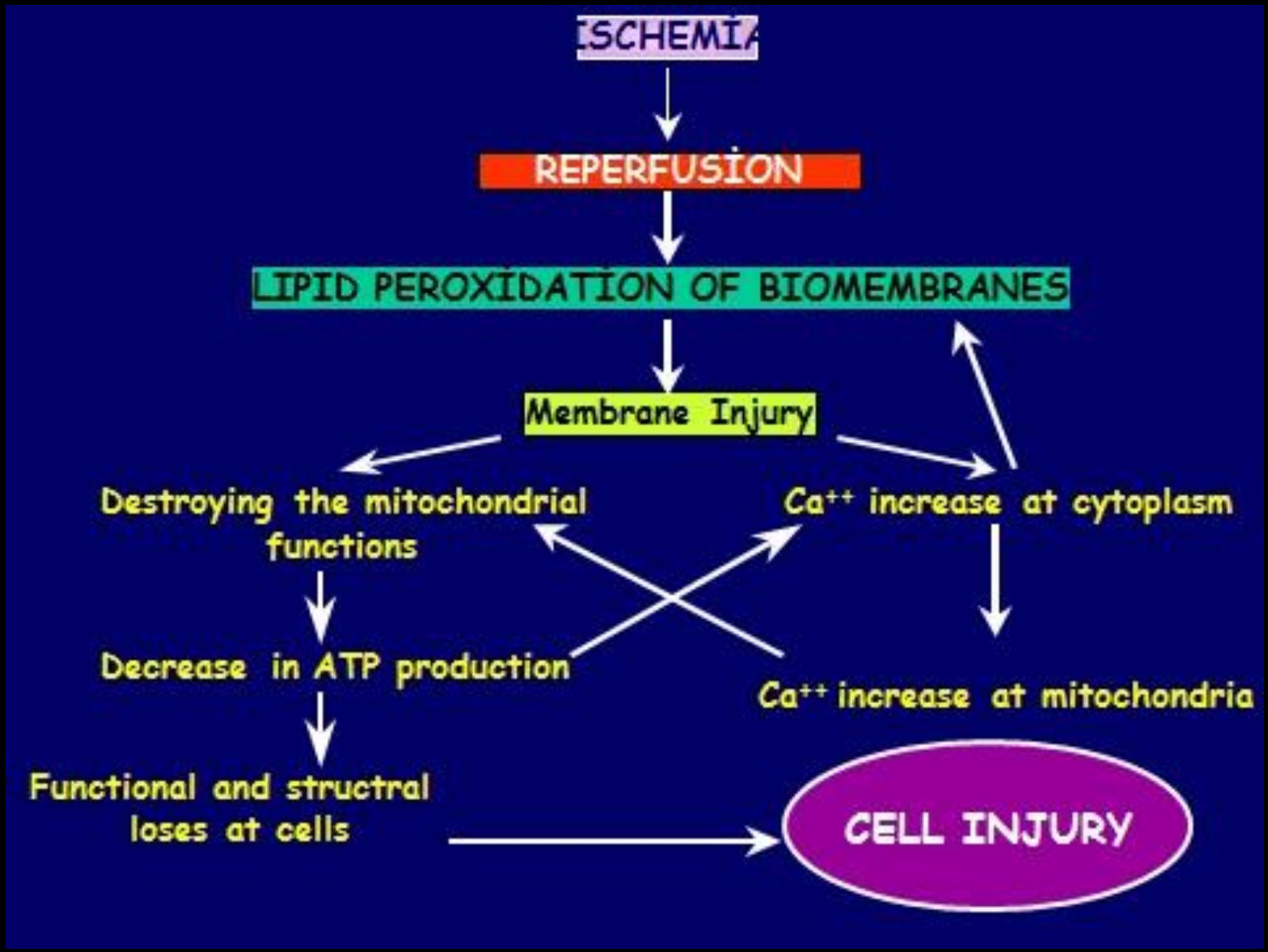
L'AGOPUNTURA NON METTE E NON TOGLIE ALCUNA SOSTANZA NELL'ORGANISMO E QUINDI:

COME POTREBBE ESERCITARE UN'AZIONE ANTIOSSIDANTE?

UNO DEI MODELLI PIU' COMUNI DI GENESI DI ROS E':

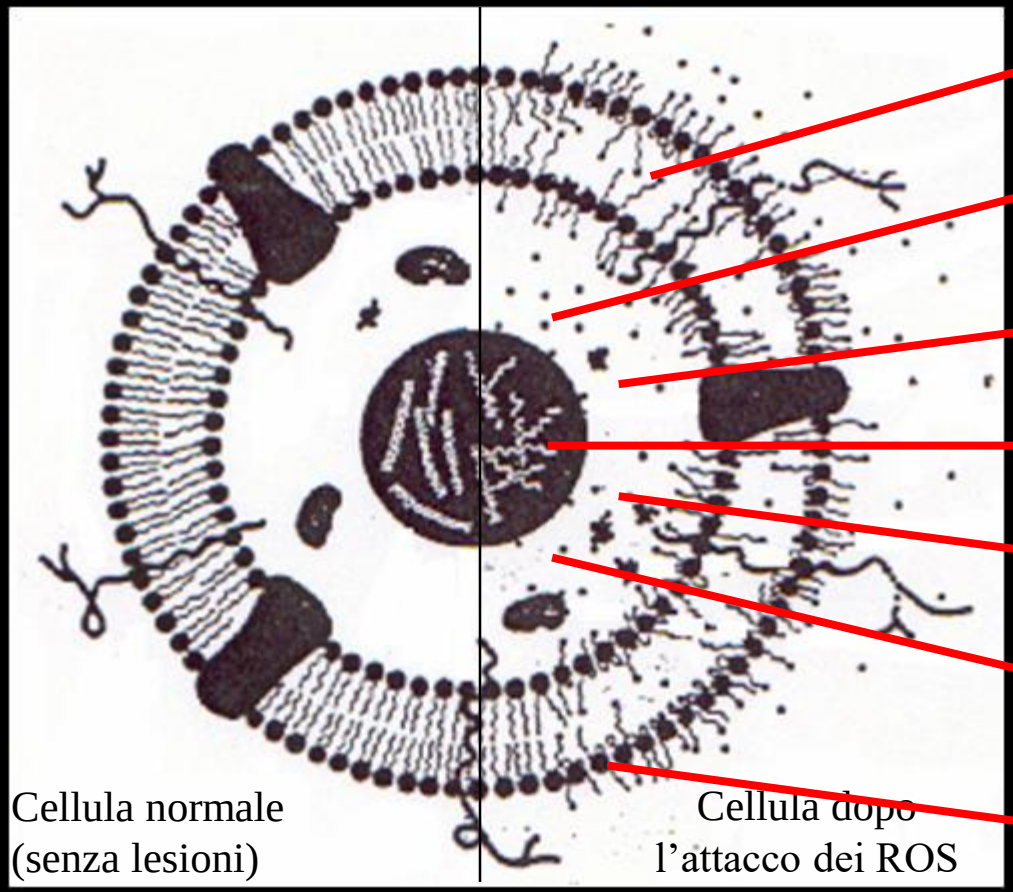
L'ISCHEMIA - IPERFUSIONE

L'AGOPUNTURA E' STATA TESTATA A FONDO SU QUESTO MODELLO E SEMBRA POTER INFLUENZARE POSITIVAMENTE IL DANNO CHE SI CREA.



AGOPUNTURA E STRESS OSSIDATIVO

Gli effetti dello stress ossidativo sulla struttura e sulle funzioni cellulari



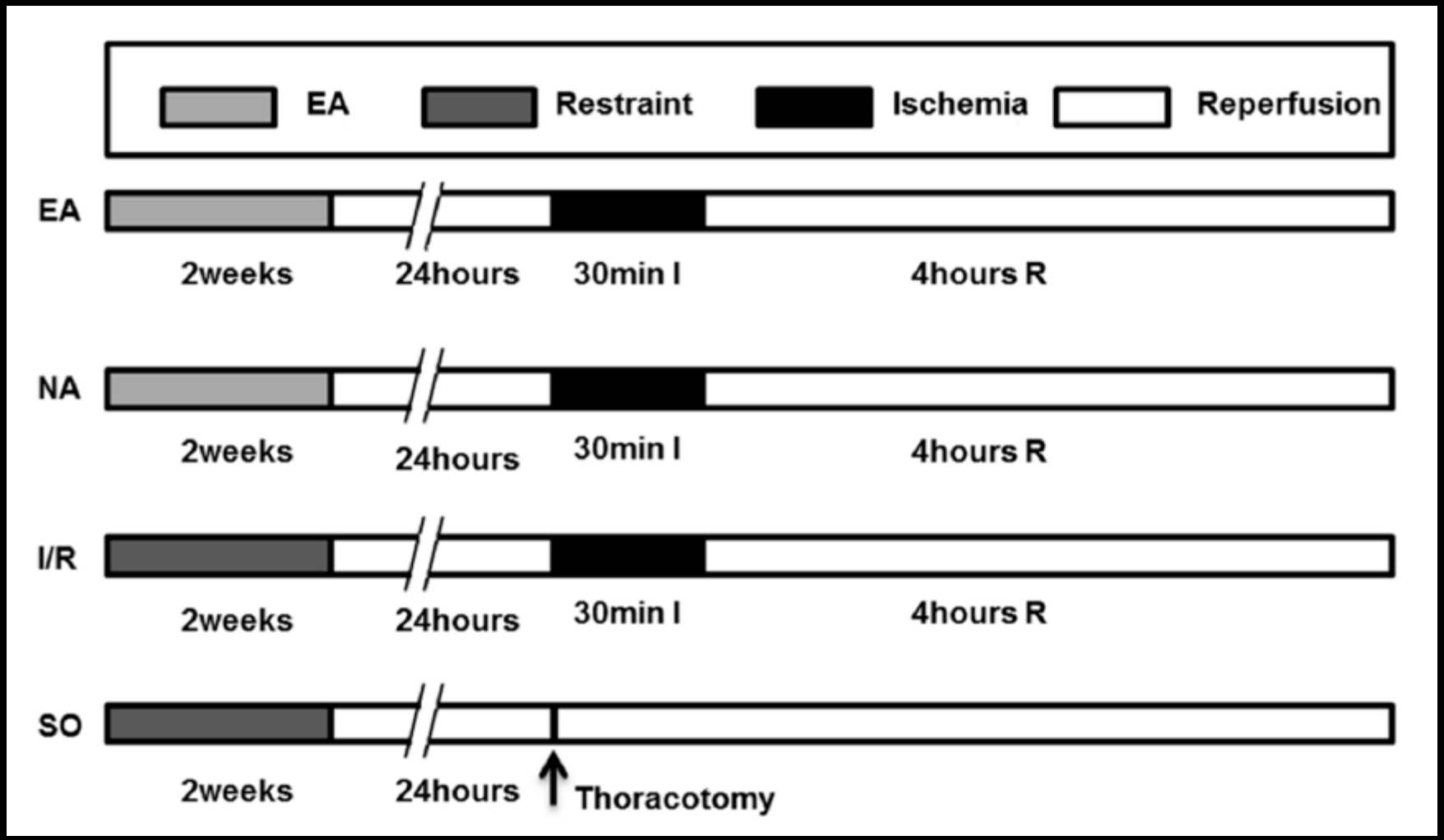
- Perossidazione di lipidi
- Modificazioni enzimatiche
- Perossidazione amino-acidi e proteine
- Modificazioni del DNA
- (Per)ossidazione di carboidrati
- Denaturazione di proteine
- Alterazioni della omeostasi ionica

HUANG ET AL.HANNO VERIFICATO IN UN MODELLO DI INFARTO DA I/R DEL MIOCARDIO COME L'ELETTROAGOPUN-TURA (EAP) DEL PC 6 (EA) SIA IN GRADO DI MIGLIORARE LA SITUAZIONE DEGLI ANIMALI RISPETTO AL GRUPPO I/R, ED AL GRUPPO DI QUELLI SOTTOPOSTI A EAP IN PUNTI FUORI MERIDIANO (NA)

DOPO 30'DI ISCHEMIA E 4 ORE DI RIPERFUSIONE SONO STATI STUDIATI:

-LA SOPRAVVIVENZA,
-LO SCORE DELL'ARITMIA,
-L'AREA INFARTUALE,
-LA CONCENTRAZIONE NEL SIERO DI CK, LDH , CK-MB CARDIACA E LA TROPONINA,
-L'ESPRESSIONE GENICA TOTALE.

Huang Y et al. Molecules 2014, 19, 16158-16178;

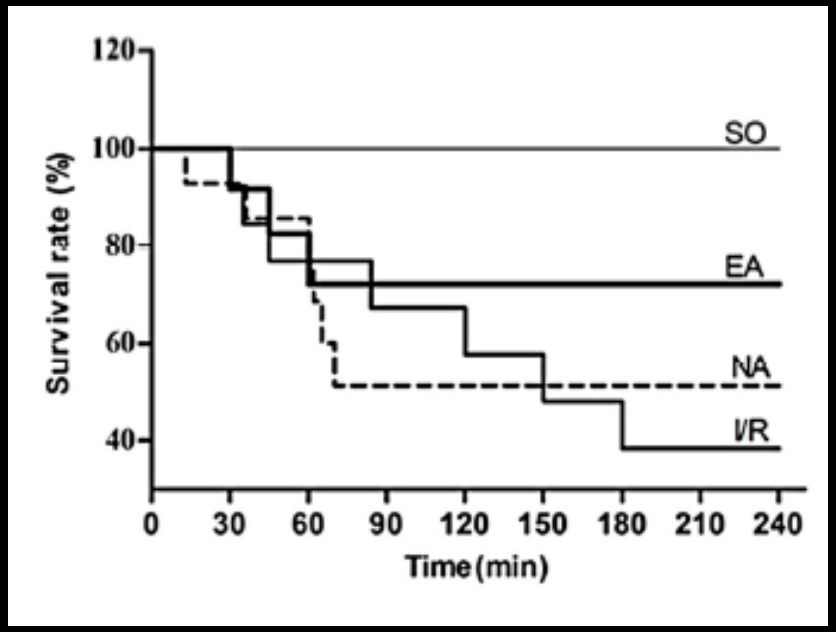


AGOPUNTURA E STRESS OSSIDATIVO

TUTTI GLI ANIMALI SONO STATI INFILATI IN UN TUBO DI CONTENZIONE PER 20 MINUTI AL GIORNO PER 12 GIORNI. NEL GRUPPO DEGLI ELETTROSTIMOLATI DUE AGHI SONO STATI INFISSI NEL PC 6 ED ELETTROSTIMOLATI PER 20 MINUTI ALLA FREQUENZA DI 2/15 Hz ALTERNATI ED ALLA INTENSITA' DI 1 mAmp.

IL MEDESIMO TRATTAMENTO HANNO SUBITO I RATTI SOTTOPOSTI A STIMOLAZIONE SHAM IN CUI GLI AGHI SONO STATI POSIZIONATI ALLA BASE DELLA CODA.

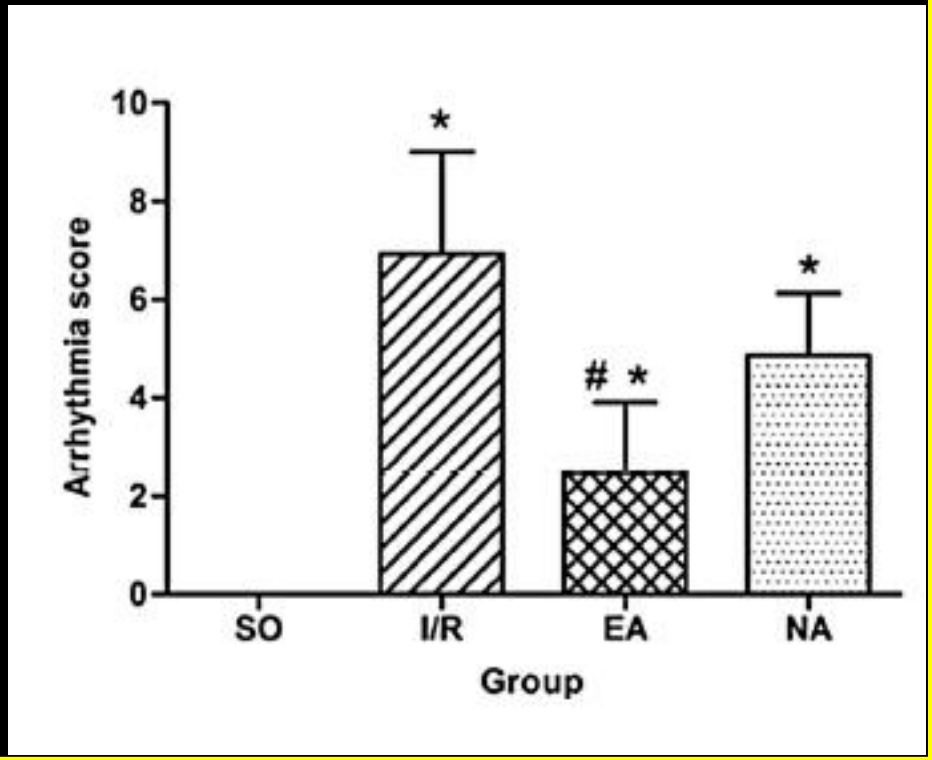
GLI ANIMALI DEGLI ALTRI DUE GRUPPI: I/R E SO (NORMALI) SONO STATI SOTTOPOSTI SOLAMENTE AL POSIZIONAMENTO.



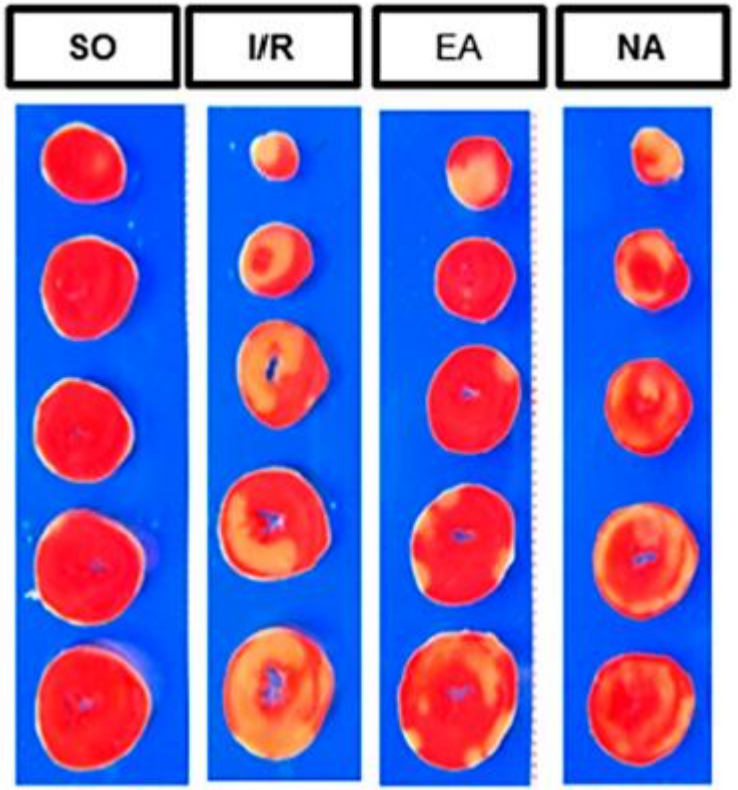
SOPRAVVISSUTI
15

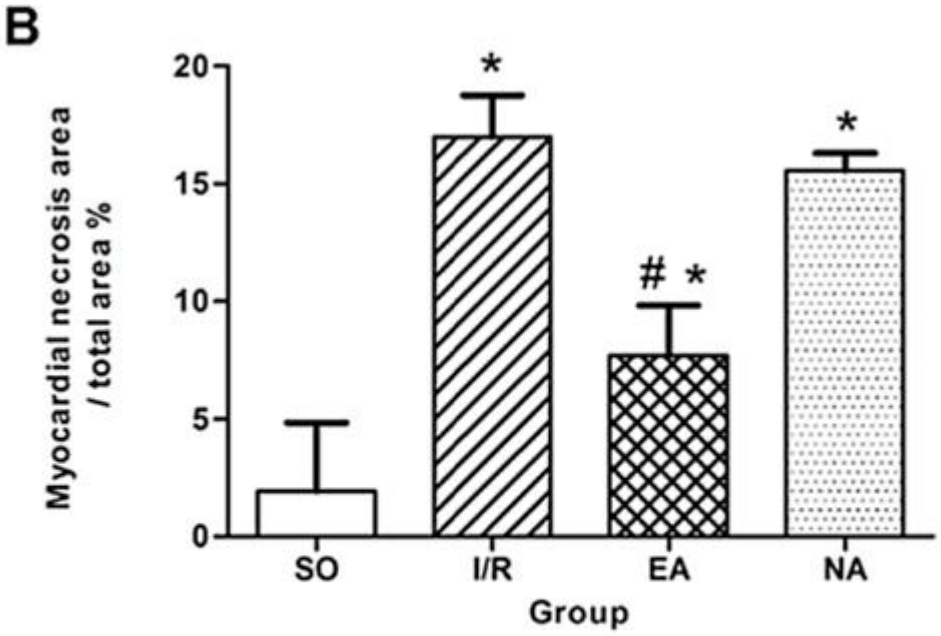
11
8
6

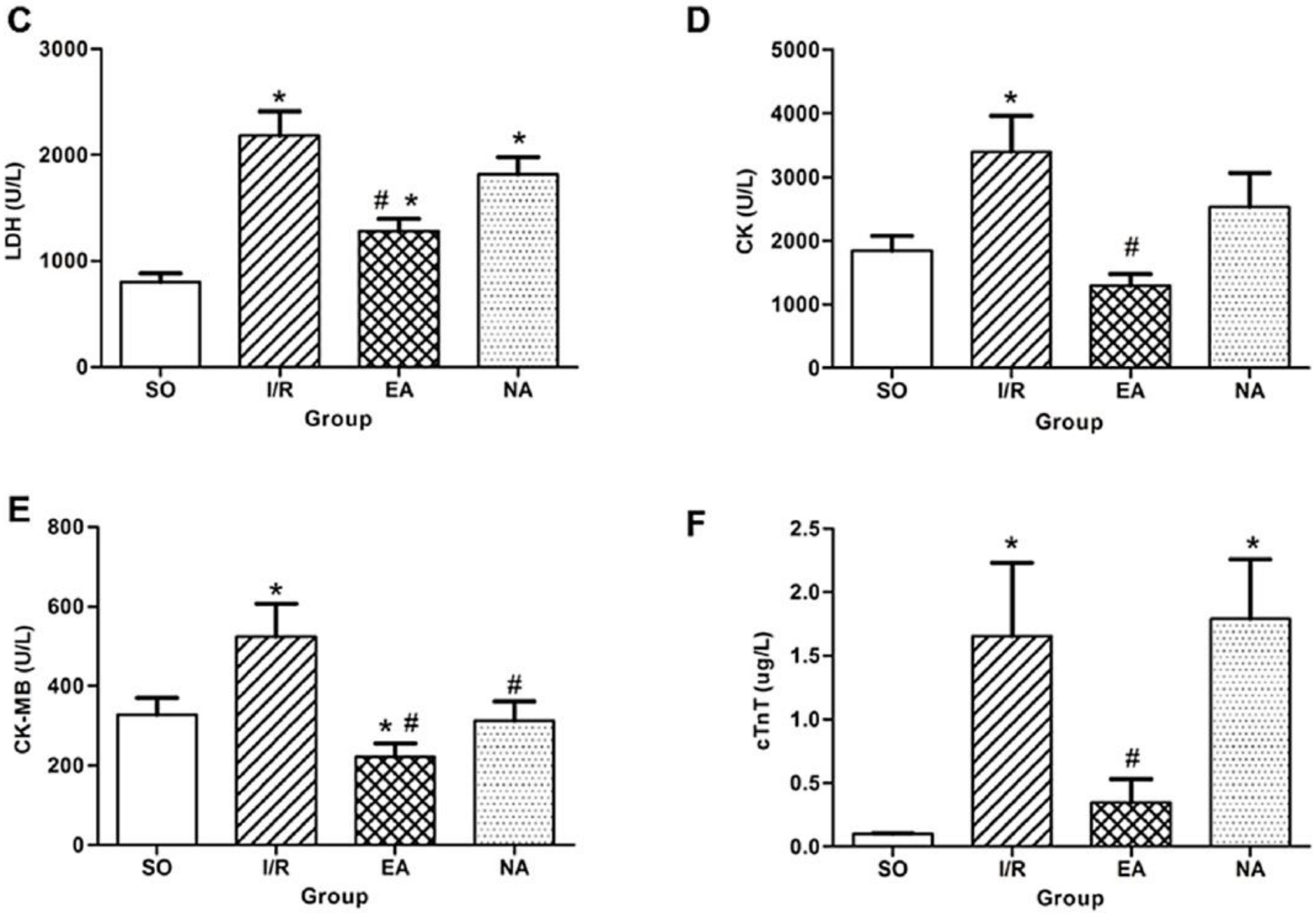
MANIFESTAZIONE ARITMIA



AREE DI NECROSI A CONFRONTO






C
LDH (U/L)
3000
2000
1000
0
SO
I/R
EA
NA
Group
D
CK (U/L)
5000
4000
3000
2000
1000
0
E
CK-MB (U/L)
800
600
400
200
F
cTnT (ug/L)
2.5
2.0
1.5
1.0
0.5
0.0

L'EAP ALTERA ANCHE L'ESPRESSIONE GENICA A LIVELLO DELL'INTERO GENOMA E CIO' E' STATO OSSERVATO MEDIANTE L'ESTRAZIONE DI RNA.

Table 1. DEGs across four groups.

DEGs	I/R:SO	EA:I/R	NA:I/R
Up regulated	725	385	364
Down regulated	861	649	355
Total	1586	1034	719

Confrontati con i controlli, 1586 geni sono stati espressi nel gruppo I/R, 861 inibiti e 725 up-regolati. L'RNA degli EAP e NA sono stati confrontati con quelli I/R.
ANCHE QUESTI VALORI DIMOSTRANO UN EFFETTO CARDIOPROTETTIVO DELLA STIMOLAZIONE AGOPUNTURALE SULLO STRESS OSSIDATIVO DA I/R.

Table 2. The top 30 differentially expressed genes with a log2 (FC) > |±1|.

A: The Top 30 Up-Regulated Genes in I/R

Gene Name	Description	I/R *vs.* SO	EA *vs.* I/R	NA *vs.* I/R
Hspa1b	heat shock 70 kD protein 1B	3.58	−1.12	0.97
Mir3074	microRNA 3074	3.1	−3.13	0.6
Kbtbd5	kelch repeat and BTB (POZ) domain containing 5	3.04	−2.87	−0.39
Fam46b	family with sequence similarity 46, member B	2.7	−1.44	−1.15
Hist1h1d	histone cluster 1, H1d	2.7	-	−1.85
Tnfrsf12a	tumor necrosis factor receptor superfamily, member 12A	2.67	−2.39	−0.43
Fos	FBJ osteosarcoma oncogene	2.57	−1.18	−1.15
Atf3	activating transcription factor 3	2.5	−1.31	−0.72
Has1	hyaluronan synthase 1	2.47	−1.83	−0.31
Camp	cathelicidin antimicrobial peptide	2.46	−0.06	1.3
Mir3556b	microRNA 3556b	2.37	-	-
Vdac3	voltage-dependent anion channel 3	2.28	0.3	−0.14
Trh	thyrotropin releasing hormone	2.24	−2.14	−2.75
Hmox1	hemeoxygenase (decycling) 1	2.23	−0.78	0.7
Cyr61	cysteine-rich, angiogenic inducer, 61	2.22	−0.98	−0.09
Pgf	placental growth factor	2.21	−1.81	0.32
Slc7a5	solute carrier family 7, member 5	2.21	−1.33	−0.08
Klk12	kallikrein related-peptidase 12	2.09	−1.5	−1.81
Sphk1	sphingosine kinase 1	2.09	−1.74	−0.72
Cblc	Cbl proto-oncogene C, E3 ubiquitin protein ligase	2.03	−1.84	−2.24
Nr4a1	nuclear receptor subfamily 4, group A, member 1	2	−0.72	−2.35
Numbl	numb homolog (Drosophila)-like	2	−1.58	−1.14
Mt1a	metallothionein 1A	1.97	−1.77	−0.44
Flnc	filamin C, gamma	1.95	−1.69	0.14
Lcn2	lipocalin 2	1.95	−0.84	−3.48
Gal	Galanin	1.94	−1.32	−1.67
Alox15	arachidonate 15-lipoxygenase	1.94	−1.74	−0.66
Akr1b8	aldo-keto reductase family 1, member B8	1.94	−1.19	−0.41
Mt2A	metallothionein 2A	1.9	−0.8	0.62
Cnot3	CCR4-NOT transcription complex, subunit 3	1.89	−1.47	−1.13

Table 2. *Cont.*

B. The Top 30 Down-Regulated Genes in I/R

Gene Name	Description	I/R *vs.* SO	EA *vs.* I/R	NA *vs.* I/R
LOC367975	unknown	−5.86	2.19	2.72
Mir145	microRNA 145	−5.32	-	-
Klre1	killer cell lectin-like receptor family E member 1	−4.58	4.27	4.8
Ky	kyphoscoliosis peptidase	−3.62	0.78	0.42
Clecsf6	C-type lectin domain family 4, member A	−3.45	2.68	1.56
RGD1306750	unknown	−3.21	2.09	1.78
Cybb	cytochrome b-245, beta polypeptide	−2.83	2.38	2.45
Ptplad2	protein tyrosine phosphatase-like A domain containing 2	−2.78	1.91	0.86
Cyp2e1	cytochrome P450, family 2, subfamily E, polypeptide 1	−2.74	2.82	−0.38
Sh2d1a	SH2 domain containing 1A	−2.71	2.4	2.73
Tas2r120	taste receptor, type 2, member 120	−2.6	1.95	0.92
Epsti1	epithelial stromal interaction 1	−2.57	1.84	1.74
C6	complement component 6	−2.56	1.35	1.54
F13a1	coagulation factor XIII, A1 polypeptide	−2.54	1.9	1.17
Bex4	brain expressed, X-linked 4	−2.5	1.31	1.05
Tfec	transcription factor EC	−2.5	2.58	2.16
Msr1	macrophage scavenger receptor 1	−2.48	2.15	3.17
Ptprc	protein tyrosine phosphatase, receptor type, C	−2.47	0.3	1.93
Clec4a2	C-type lectin domain family 4, member A2	−2.45	2.31	1.75
Cd69	CD69molecule	−2.42	1.89	1.04
Agr2	anterior gradient 2	−2.41	0.25	1.26
Igsf6	immunoglobulin superfamily, member 6	−2.41	1.73	2.51
Lilra5	leukocyte immunoglobulin-like receptor, subfamily A, member 5	−2.38	2.06	−0.23
Klri1	killer cell lectin-like receptor family I member 1	−2.34	2.18	1.73
Ubd	ubiquitin D	−2.32	0.46	0.98
Ahr	aryl hydrocarbon receptor	−2.32	1.78	1.33
Ccr2	chemokine (C-C motif) receptor 2	−2.31	2.52	2.7
Pkhd1l1	polycystic kidney and hepatic disease 1-like 1	−2.31	2.03	1.45
Mpeg1	macrophage expressed 1	−2.29	2.07	2.25
Dock11	dedicator of cytokinesis 11	−2.28	1.62	1.19

L'ISCHEMIA RIPERFUSIONE DETERMINA LA UP E DOWN-REGOLAZIONE DI CENTINAIA DI GENI. LA PRESTIMOLAZIONE ELETTROAGOPUNTURALE DETERMINA UNA MODULAZIONE INVERSA DEL 44% DEI GENI UP-REGOLATI E DEL 32% DI QUELLI DOWN-REGOLATI.

MOLTI DI QUESTI GENI CONTRIBUISCONO AD UNA CARDIOPROTEZIONE ATTENUANDO IL DANNO DA I/R, SOPPRIMENDO ALCUNI PERCORSI FUNZIONALI PATOGENETICI.

REGULAR PAPER

J. Physiol. Sci. Vol. 58, No. 6, Dec. 2008, pp. 389–396
Online Oct. 10, 2008; doi:10.2170/physiolsci.RP007108

Antiarrhythmic Effect of Acupuncture Pretreatment in Rats Subjected to Simulative Global Ischemia and Reperfusion — Involvement of Adenylate Cyclase, Protein Kinase A, and L-Type Ca^{2+} Channel

Junhong GAO[1], Ling ZHANG[2], Yumin WANG[2], Bo LU[3], Haifeng CUI[3], Weixing FU[1], Hongxin WANG[2], Youhua YU[3], and Xiaochun YU[3]

Am J Physiol Heart Circ Physiol 302: H1818–H1825, 2012.
First published February 24, 2012; doi:10.1152/ajpheart.00030.2012.

Cardioprotection of electroacupuncture against myocardial ischemia-reperfusion injury by modulation of cardiac norepinephrine release

Wei Zhou, Yoshihiro Ko, Peyman Benharash, Kentaro Yamakawa, Sunny Patel, Olujimi A. Ajijola, and Aman Mahajan

Hindawi Publishing Corporation
Evidence-Based Complementary and Alternative Medicine
Volume 2016, Article ID 4609784, 9 pages
http://dx.doi.org/10.1155/2016/4609784

Cardioprotective Effect of Electroacupuncture Pretreatment on Myocardial Ischemia/Reperfusion Injury via Antiapoptotic Signaling

Sheng-feng Lu, Yan Huang, Ning Wang, Wei-xing Shen, Shu-ping Fu, Qian Li, Mei-ling Yu, Wan-xin Liu, Xia Chen, Xin-yue Jing, and Bing-mei Zhu

Hindawi Publishing Corporation
Evidence-Based Complementary and Alternative Medicine
Volume 2015, Article ID 625645, 9 pages
http://dx.doi.org/10.1155/2015/625645

Additional Effects of Back-Shu Electroacupuncture and Moxibustion in Cardioprotection of Rat Ischemia-Reperfusion Injury

Seung Min Kathy Lee, Kang Hyun Yoon, Jimin Park, Hyun Soo Kim, Jong Shin Woo, So Ra Lee, Kyung Hye Lee, Hyun-Hee Jang, Jin-Bae Kim, Woo Shik Kim, Sanghoon Lee, and Weon Kim

Basic Res Cardiol (2012) 107:241
DOI 10.1007/s00395-011-0241-5

Remote cardioprotection by direct peripheral nerve stimulation and topical capsaicin is mediated by circulating humoral factors

Kathrine L. Redington · Tara Disenhouse · Samuel C. Strantzas · Rachel Gladstone · Can Wei · Michael B. Tropak · Xiaojing Dai · Cedric Manlhiot · Jing Li · Andrew N. Redington

J Physiol Sci (2013) 63:219–223
DOI 10.1007/s12576-013-0259-6

Electroacupuncture reduces myocardial infarct size and improves post-ischemic recovery by invoking release of humoral, dialyzable, cardioprotective factors

Kathrine L. Redington · Tara Disenhouse · Jing Li · Can Wei · Xiaojing Dai · Rachel Gladstone · Cedric Manlhiot · Andrew N. Redington

Res Cardiol (2014) 109:406
10.1007/s00395-014-0406-0

Transcutaneous electrical nerve stimulation as a novel method of remote preconditioning: in vitro validation in an animal model and first human observations

Anthony C. Merlocco · Kathrine L. Redington · Tara Disenhouse · Samuel C. Strantzas · Rachel Gladstone · Can Wei · Michael B. Tropak · Cedric Manlhiot · Jing Li · Andrew N. Redington

AGOPUNTURA E STRESS OSSIDATIVO

Cardioprotective Effects of Electroacupuncture Pretreatment on Patients Undergoing Heart Valve Replacement Surgery: A Randomized Controlled Trial

Lifang Yang, MD,* Jian Yang, MD,* Qiang Wang, MD, Min Chen, MD, Zhihong Lu, MD, Shaoyang Chen, MD, and Lize Xiong, MD, PhD

(Ann Thorac Surg 2010;89:781–6)

60 PAZIENTI OPERANDI PER SOSTITUZIONE VALVOLARE SONO STATI DIVISI IN DUE GRUPPI: IL PRIMO COME CONTROLLO ED IL SECONDO E' STATO PRESTIMOLATO CON ELETTROAGOPUNTURA. NEI 5 GIORNI PRECEDENTI L'INTERVENTO; IN TUTTI E' STATA EFFETTUATA UNA SEDUTA DI 30' DI EAP NEI SEGUENTI PUNTI: PC 6, LU 7 E LU 2.

SONO STATI CONFRONTATI IL TEMPO DI VENTILAZIONI MECCANICA, I VALORI EMODINAMICI, L'USO DI FARMACI INOTROPI NEL POSTOPERATORIO, LA TROPONINA E LA MORBIDITA' E MORTALITA'

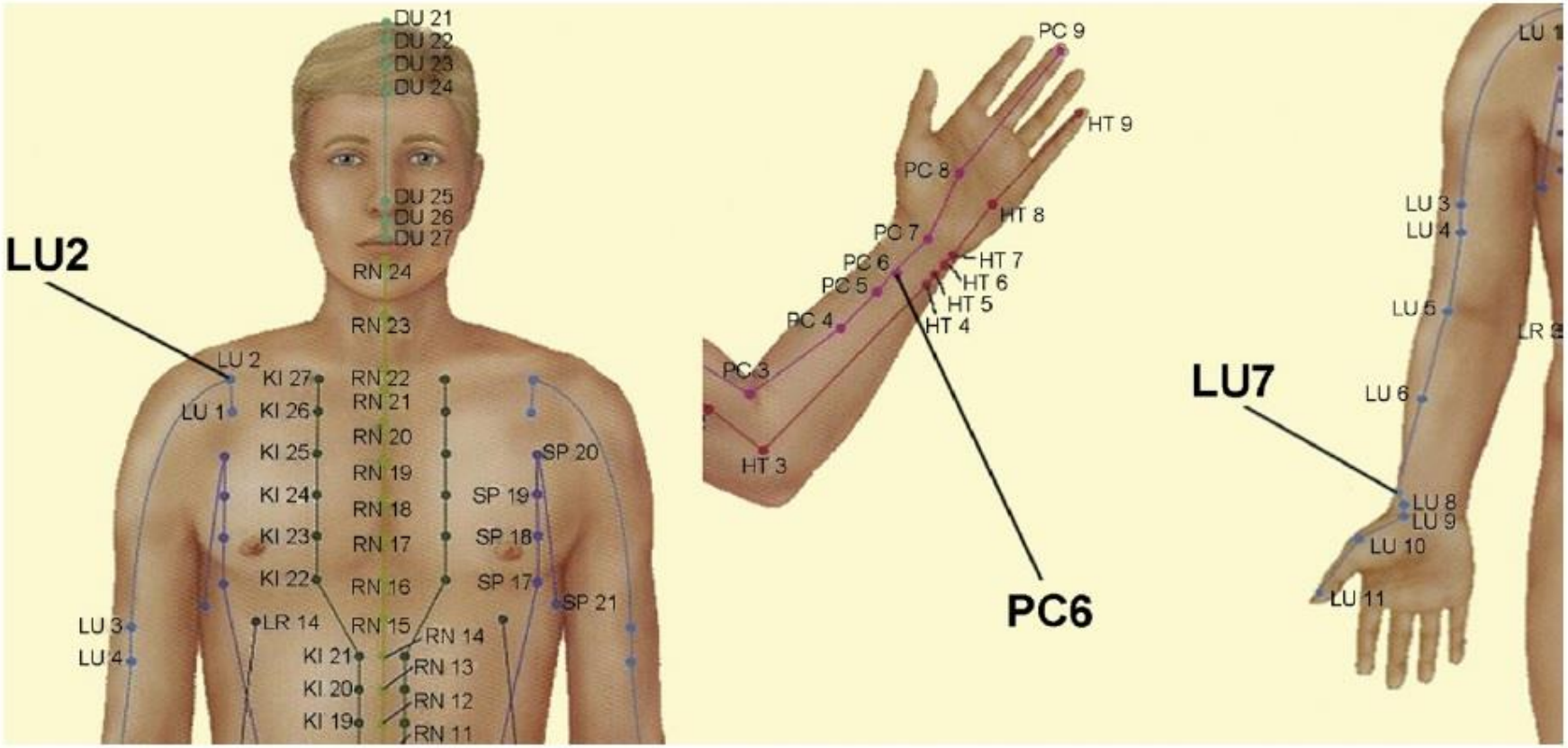


Fig 1. Anatomic position of Neiguan (PC 6), Lieque (LU 7), and Yunmen (LU 2) sites.

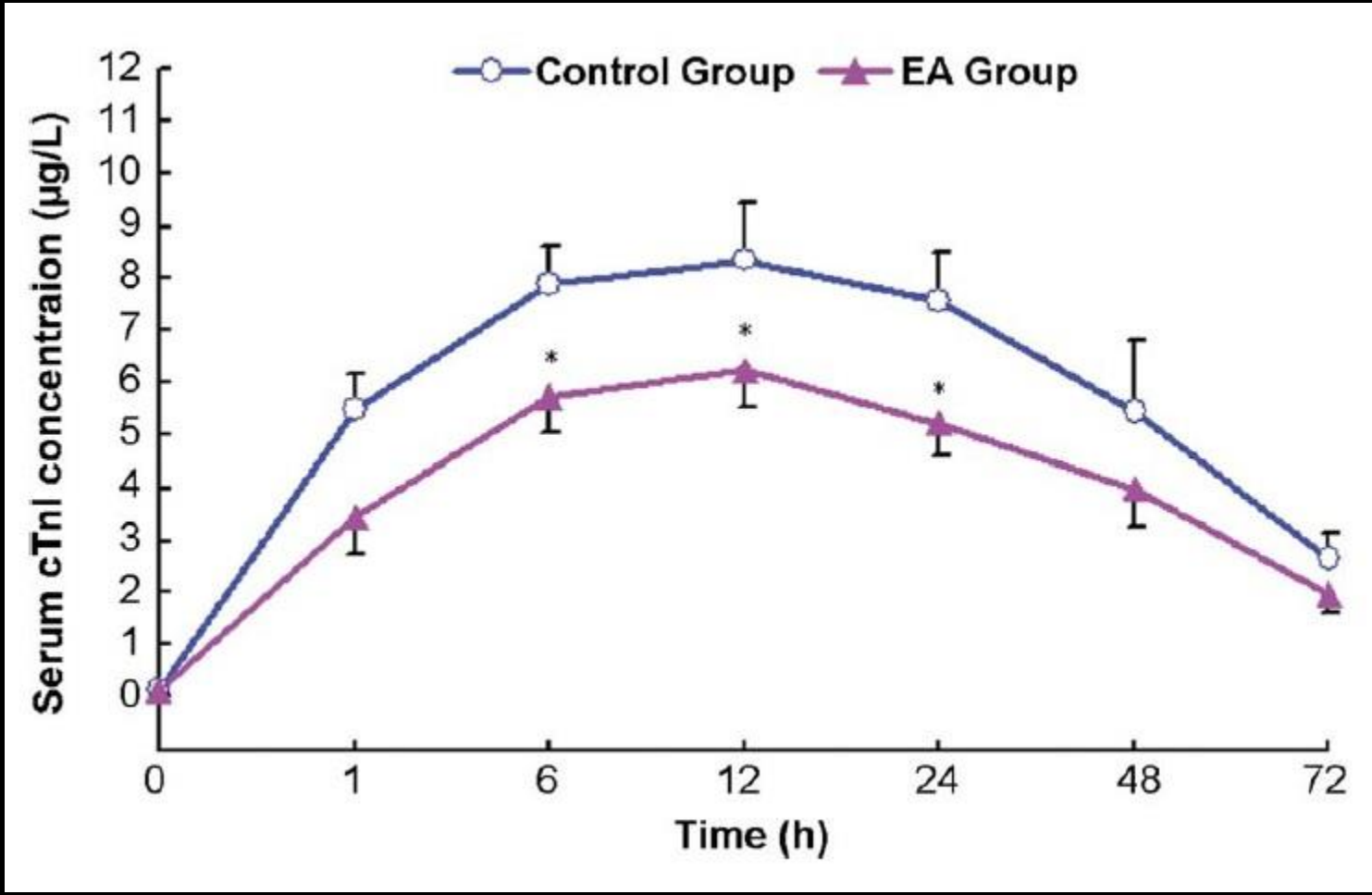
LIVELLI DELLA TROPONINA CARDIACA

Table 3. Serum Cardiac Troponin I Levels of the Study Population (ng/mL)

Time	Control	Electroacupuncture	*p* Value
1 hour	0.15±0.37	0.14±0.39	0.991
3 hours	5.51±3.67	3.44±3.68	0.073
6 hours	7.89±4.04	5.74±3.62	0.037
12 hours	8.34±5.93	6.22±3.53	0.042
24 hours	7.57±4.89	5.21±3.10	0.039
48 hours	5.43±7.60	3.97±3.83	0.165
72 hours	2.65±2.45	1.97±2.07	0.398

The difference between groups was analyzed with the two-way analysis of variance test and the multiple comparisons were made with the least significant difference post hoc test.

CONFRONTO DEI LIVELLI DI TROPONINA CARDIACA



UTILIZZO DI FARMACI INOTROPI

Table 4. Inotrope Scores of the Study Population After Intensive Care Unit Arrival (n = 30 Each, Mean ± Standard Error of the Mean)[a]

Time Points After ICU Arrival	Control Group	EA Group	*p* Value
1 hour	8.1±0.69	6.4±0.62	0.073
3 hours	8.3±0.71	6.5±0.62	0.062
6 hours	8.5±0.68	6.7±0.64	0.058
12 hours	8.4±0.69	6.5±0.64	0.049
24 hours	8.3±0.64	6.3±0.60	0.027
48 hours	7.8±0.62	5.9±0.58	0.030

[a] The inotrope score is presented as μg/(kg-minutes) and was calculated as dopamine (×1) + dobutamine (×1) + amrinone (×1) + milrinone (×15) + epinephrine (×100) + norepinephrine (×100) + isoprenaline (×100). The difference between groups was analyzed with the two-way analysis of variance test, and the multiple comparisons were made with the least significant difference post hoc test.

EA = electroacupuncture; ICU = intensive care unit.

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Neuroscience Letters 393 (2006) 45–50
Neuroscience Letters
www.elsevier.com/locate/neulet

Acupuncture prevents cognitive deficits and oxidative stress in cerebral multi-infarction rats

Cun-Zhi Liu , Jian-Chun Yu , Xue-Zhu Zhang , Wei-Wei Fu , Tong Wang , Jing-Xian Han

90 RATTI DIVISI IN TRE GRUPPI: 60 GRUPPO INTERVENTO; 15 GRUPPO NORMALE, E 15 SHAM OPERATI. NEI 60 RATTI E' STATO INIETTATO UN TROMBO DI 0.30 ml NELL'ARTERIA CAROTIDE INTERNA. NEGLI SHAM OPERATI 0.30 ml DI SOLUZIONE FISIOLOGICA. IL LIVELLO COGNITIVO A VARI TEMPI E' STATO MISURATO CON IL MORRIS WATER MAZE TEST. SONO STATI ANCHE MISURATI I LIVELLI DI ATTIVITA' IPPOCAMPALE DI SUPEROSSIDODISMUTASI, GLUTATIONE PEROSSIDASI E CATALASI.

IL MORRIS TEST SERVE PER MISURARE IL LIVELLO COGNITIVO. IL RATTO VIENE ALLENATO PRIMA DELLA PROCEDURA

Acupuncture points, their anatomical positions, and their innervations

Theraphic method	Points	Location
Acupuncture treat-ment	CV17	On the anterior median line of the chest, at the level of the fourth intercostal space, at the midpoint between the two nipples.
	CV12	On the anterior median line of the upper abdomen, 20 mm below the xiphisternal synchondroses.
	CV6	On the anterior median line of the lower abdomen, 10 mm below the umbilicus.
	SP10	When the knee is flexed, on the medial aspect of the thigh, the point is 4 mm above the mediosuperior border of the patella, on the bulge of the medial portion of M quadriceps femoris.
	ST36	5 mm below head of fibula under knee joint, and 2 mm lateral to the anterior tubercle of the tibia.
Placebo-acupuncture		On the hypochondrium, 10 mm above iliac crest.

21 GIORNI PRIMA DELLA PROCEDURA E' STATA EFFETTUATA NEL GRUPPO AGOPUNTURA E SHAM AGOPUNTURA UNA SEDUTA GIORNALIERA DI STIMOLAZIONE CON ROTAZIONE DEGLI AGHI PER 30"; NEL GRUPPO PLACEBO PER 105".
I RATTI SONO STATI DIVISI IN 5 GRUPPI:

A: NORMALI; B:SHAM OPERATI; C: CON TROMBO; D: CON TROMBO E AGOPUNTURA; E: CON TROMBO E SHAM AGOPUNTURA.

RISULTATI

Effect of acupuncture on SOD, GSH-Px and CAT activities in the hippocampus

Groups	*n*	SOD (U/mgProt)	GSH-Px (U/mgProt)	CAT (U/mgProt)
Normal	9	$120.30 \pm 10.74^{\Delta,\#}$	$7.06 \pm 0.55^{\Delta\Delta,\#\#}$	1.46 ± 0.32
Sham-operated	9	$122.10 \pm 6.05^{\Delta\Delta,\#\#}$	$6.26 \pm 0.49^{\Delta\Delta,\#}$	1.12 ± 0.40
Impaired	9	$105.53 \pm 8.56^{*}$	$5.26 \pm 0.90^{**}$	1.57 ± 0.37
Acupuncture	9	$121.04 \pm 9.71^{\Delta,\#}$	$6.90 \pm 0.56^{\Delta\Delta,\#\#}$	1.51 ± 0.36
Placebo-acupuncture	9	$105.05 \pm 9.82^{*}$	$5.45 \pm 1.12^{**}$	1.16 ± 0.25

Note: Values are expressed as mean ± S.E.M. of nine animals in each group.

* $P < 0.05$.

** $P < 0.01$ vs. the normal group.

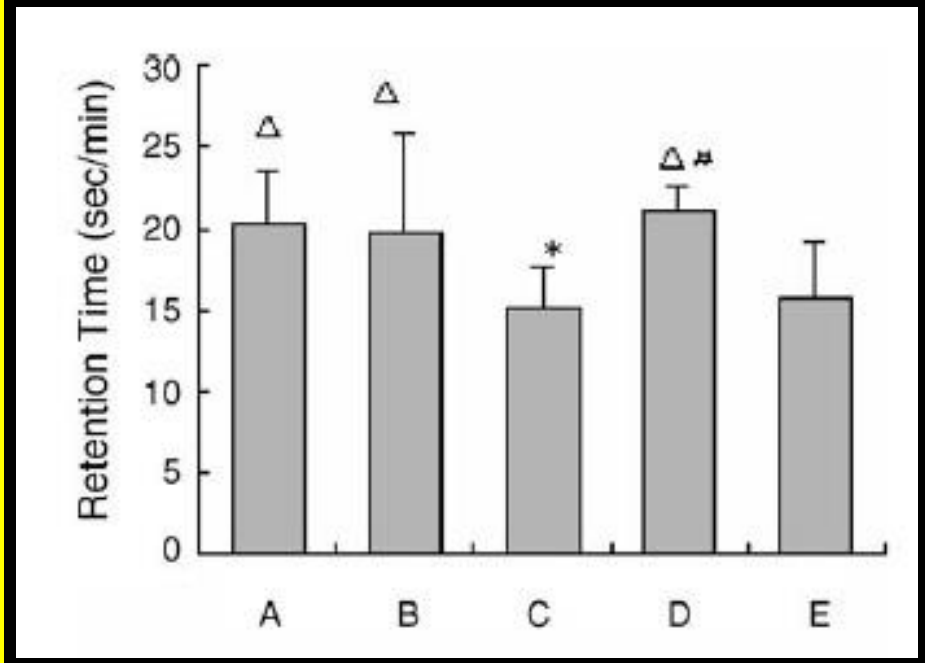
$^{\Delta}$ $P < 0.05$.

$^{\Delta\Delta}$ $P < 0.01$ vs. the impaired group.

$^{\#}$ $P < 0.05$.

$^{\#\#}$ $P < 0.01$ vs. the placebo-acupuncture group.

RISULTATI



NUMERO DI SECONDI IN CUI IL RATTO STA FERMO NEL LUOGO IN CUI HA IMPARATO CI FOSSE LA PIATTAFORMA

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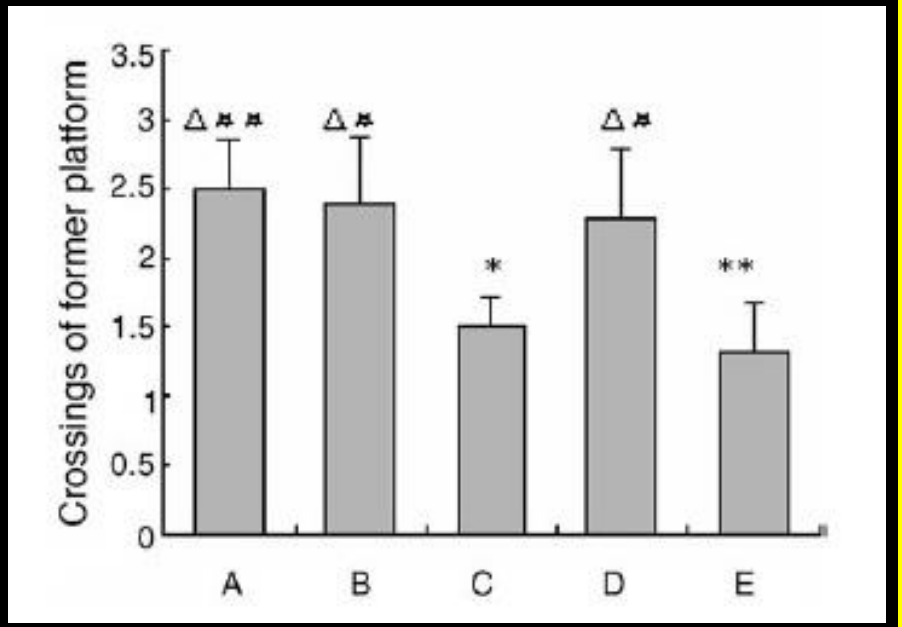

NEURAL REGENERATION RESEARCH
July 2016, Volume 11, Issue 7

Mechanisms of electroacupuncture effects on acute cerebral ischemia/reperfusion injury: possible association with upregulation of transforming growth factor beta 1

Wen-biao Wang , Lai-fu Yang , Qing-song He , Tong Li , Yi-yong Ma , Ping Zhang , Yi-sheng Cao

Neuroscience Letters 558 (2014) 14–19

Contents lists available at ScienceDirect

Neuroscience Letters

journal homepage: www.elsevier.com/locate/neulet

Electro-acupuncture at points of Zusanli and Quchi exerts anti-apoptotic effect through the modulation of PI3K/Akt signaling pathway

Xiehua Xue , Yongmei You , Jing Tao , Xiaoqian Ye , Jia Huang , Shanli Yang , Zhicheng Lin , Zhenfeng Hong , Jun Peng , Lidian Chen

INTERNATIONAL JOURNAL OF MOLECULAR MEDICINE 30: 791-796, 2012

Electroacupuncture at the Quchi and Zusanli acupoints exerts neuroprotective role in cerebral ischemia-reperfusion injured rats via activation of the PI3K/Akt pathway

AZHEN CHEN , ZHICHENG LIN , LAN LAN , GUANLI XIE , JIA HUANG , JIUMAO LIN , JUN PENG , JING TAO and LIDIAN CHEN

Chin J Integr Med 2016 Jan;22(1):49-55

Effects of Acupuncture at Baihui (GV 20) and Zusanli (ST 36) on Peripheral Serum Expression of MicroRNA 124, Laminin and Integrin β1 in Rats with Cerebral Ischemia Reperfusion Injury*

CHEN Su-hui (陈素辉), SUN Hua (孙华), ZHANG Ya-min (张亚敏), XU Hong (徐虹), YANG Yang (杨扬), and WANG Fu-ming (王富明)

Available online at www.sciencedirect.com

SciVerse ScienceDirect

www.elsevier.com/locate/brainres

BRAIN RESEARCH

Electroacupuncture pretreatment prevents cognitive impairment induced by limb ischemia-reperfusion via inhibition of microglial activation and attenuation of oxidative stress in rats

Ye Chen , Jun Zhou , Jun Li , Shi-Bin Yang , Li-Qun Mo , Jie-Hui Hu , Wan-Li Yuan

Jung et al. Journal of Biomedical Science (2016) 23:32
DOI 10.1186/s12929-016-0249-0

Journal of Biomedical Science

科技部 Ministry of Science and Technology

Electroacupuncture preconditioning reduces ROS generation with NOX4 down-regulation and ameliorates blood-brain barrier disruption after ischemic stroke

Yeon Suk Jung , Sae-Won Lee , Jung Hwa Park , Hyung Bum Seo , Byung Tae Choi Hwa Kyoung Shin

Available online at www.sciencedirect.com

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Life Sciences

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Life Sciences 75 (2004) 1323–1332

www.elsevier.com/locate/lifescie

Effectiveness of multiple pre-ischemia electro-acupuncture on attenuating lipid peroxidation induced by cerebral ischemia in adult rats

Flora K.W. Siu , Samuel C.L. Lo , Mason C.P. Leung

AGOPUNTURA E STRESS OSSIDATIVO

J Neuroimmune Pharmacol (2014) 9:492–507
DOI 10.1007/s11481-014-9550-4

Mechanisms Underlying the Effect of Acupuncture on Cognitive Improvement: A Systematic Review of Animal Studies

Mason Chin Pang Leung · Ka Keung Yip ·
Yuen Shan Ho · Flora Ka Wai Siu · Wai Chin Li ·
Belinda Garner

GLI AUTORI COMPIONO UNA RASSEGNA SU TUTTI I LAVORI ANIMALI CONCERNENTI L'MPATTO DELLA STIMOLAZIONE AGOPUNTURALE SUL LIVELLO COGNITIVO DEGLI ANIMALI SOTTOPOSTI A LESIONI CEREBRALI, ED I DIVERSI MECCANISMI INDIVIDUATI NEI DIVERSI STUDI E MODELLI.

DI 223 STUDI INDIVIDUATI NE SONO STATI SELEZIONATI 19 CONSIDERATI DI QUALITA'.

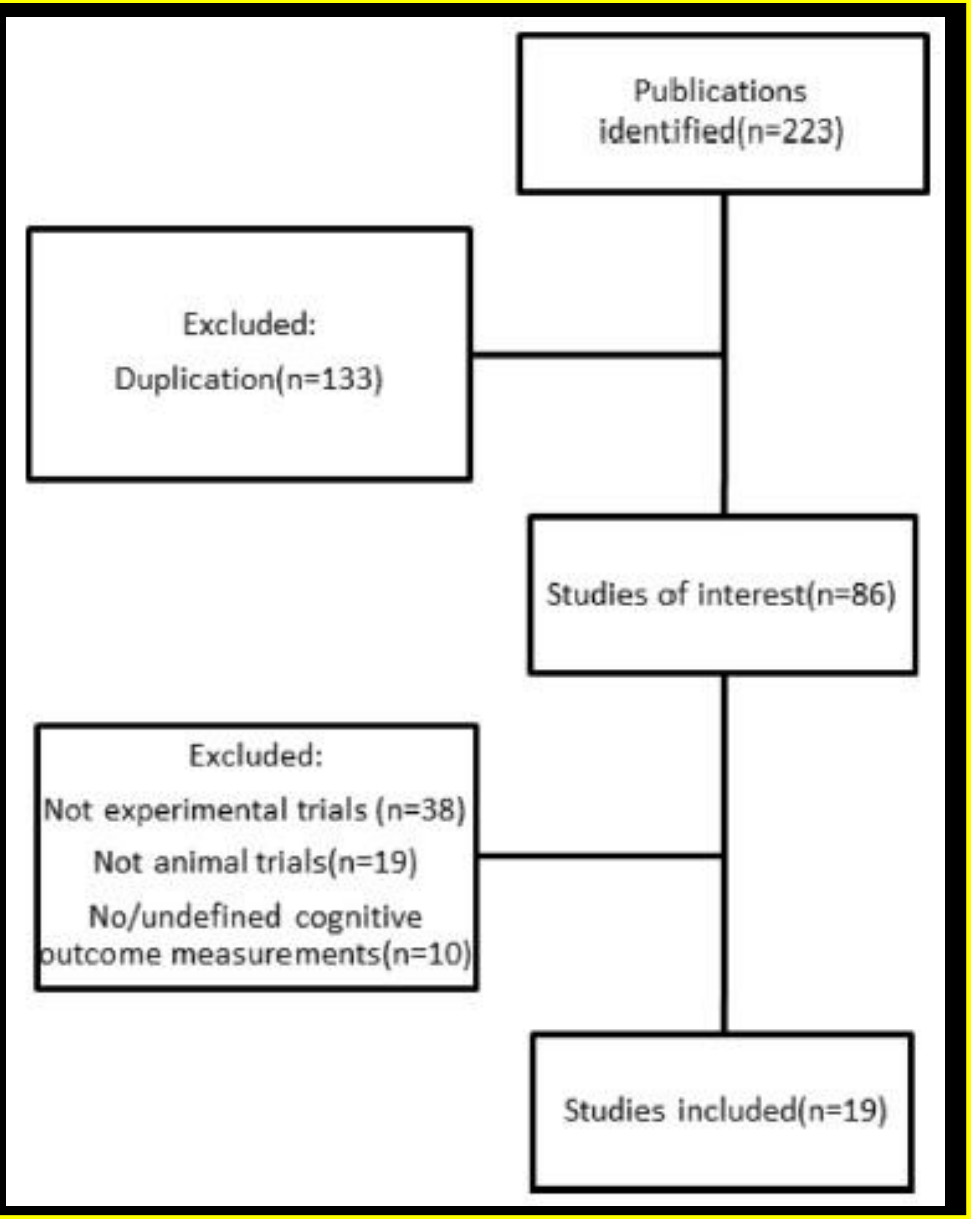


Table 1 Summary of study design

Study	Model	Design			Intervention Protocol		
		Randomization	Blinded	Control group	Acupoint	Treatment modality and duration	Number of treatment sessions
Wang et al. (2004)	Bilateral vertebral arteries and bilateral common carotid arteries occlusion	Yes	No	Sham operation and operation	GV14 and GV20	EA, 20 min daily	15
Liu et al. (2006)	Embolic injection to right internal carotid artery	Yes	No	Normal, sham operation and operation	CV6, CV12, CV17, SP10 and ST36	Manual, 30 s per point daily	18
Zhu et al. (2008)	Bilateral carotid arteries occlusion	Yes	No	Sham operation	BL23, GV14 and GV20	EA, daily with no mentioned duration	30
Manni et al. (2009)	Social isolation	No	No	Normal, normal with acupuncture and operation	ST36	EA, 30 min daily	4
Wang et al. (2009)	Embolic injection to right internal carotid artery	Yes	No	Normal, sham operation, operation and operation with sham acupuncture	CV6, CV12, CV17, SP10 and ST36	Manual, 30 s per point daily	18
Feng et al. (2010)	High-sustained positive acceleration exposure	Yes	Yes	Sham operation and operation	GV20	EA pretreatment, 30 min daily	5
Kim et al. (2011a)	Chronic unpredictable stress	No	No	Sham operation and operation	PC6	Manual, 180 s applied 3 times a week	12
Wei et al. (2011)	Bilateral common carotid arteries occlusion	Yes	No	Sham operation and operation	GV14 and GV20	EA, 20 min daily	10
Zhao et al. (2011)	Embolic injection to right internal carotid artery	Yes	No	Normal, sham operation, operation and operation with sham acupuncture	CV6, CV12, CV17, SP10 and ST36	Manual, 30 s per point daily	18
Zhu and Zeng (2011)	Bilateral common carotid arteries occlusion	No	No	Sham operation and operation	BL23, GV14 and GV20	EA, 20 min daily	30
Chen et al. (2012)	Bilateral lower limb ligation	No	No	Sham operation and operation	GB34, GV20, LR3, SP10 and ST36	EA pretreatment, 30 min daily	14
He (2012)	Bilateral vertebral arteries and bilateral common carotid arteries occlusion	Yes	No	Sham operation and operation	HT9, KI1, LU11 and PC9	EA, 20 min daily	14
Jittiwat and Wattanathorn (2012)	Right middle cerebral artery occlusion	No	No	Operation and operation with sham acupuncture	GV20	Manual, 1 min daily	14
Lee et al. (2012)	Subcutaneous injection of corticosterone	Yes	Yes	Sham operation, Operation, Operation with sham acupuncture	HT7	Manual, 5 min daily	21
Zhu et al. (2012)	Bilateral common carotid arteries occlusion	Yes	No	Sham operation and operation	BL23, GV14 and GV20	EA, 20 min daily	30
Han et al. (2013)	Bilateral common carotid arteries occlusion	Yes	No	Sham operation and operation	GV14 and GV20	EA, 20 min daily	7
Liu et al. (2013)	Left hippocampus injection of amyloid β1-40	Yes	No	Sham operation and operation	EX-HN3 and LI20	EA, 10 min daily	30
Sutalangka et al. (2013)	Bilateral intra-cerebroventricular infusion of AF64A	Yes	No	Normal, sham operation, sham operation with acupuncture, operation and operation with sham acupuncture	HT7	Laser, 10 min daily	14
Zhu et al. (2013)	Bilateral common carotid arteries occlusion	No	No	Sham operation and operation	BL23, GV14 and GV20	EA, 20 min daily	30

EA electroacupuncture, Manual, Acupuncture, Laser, Laser acupuncture, Ethylcholine mustard aziridinium ion (AF64A)

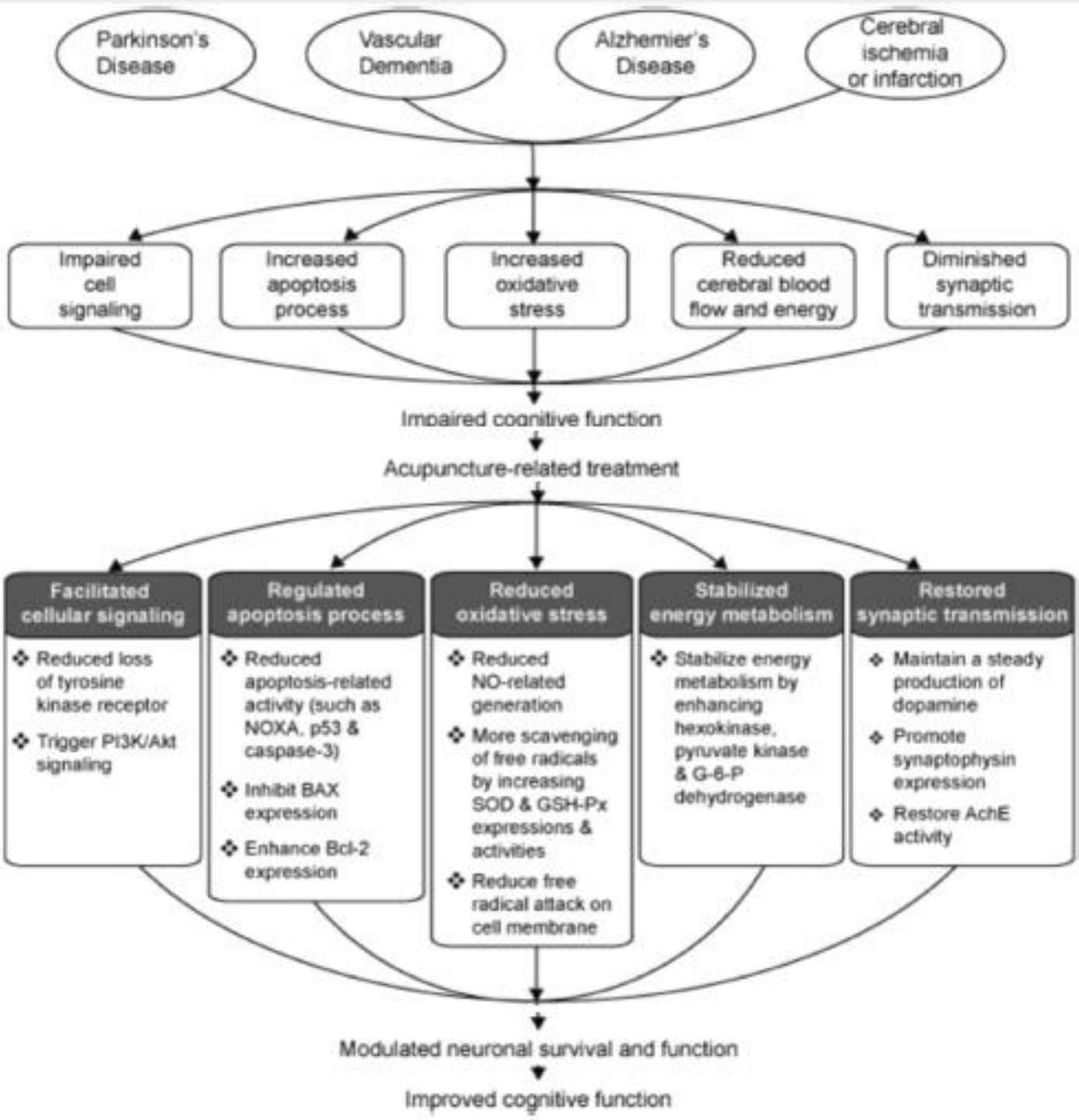
Table 2 Summary of cognitive outcome measures and proposed mechanisms

Study	Cognitive outcome measure	Findings & Proposed mechanisms
Wang et al. (2004)	Time of place test and spatial probe test of Morris water maze	• Reduced NO, NOS and MDA • Increased SOD and GSH-Px
Liu et al. (2006)	Time of mean escape latency and probe trial of Morris water maze	• Increased SOD and GSH-Px, CuZnSOD positive cells and CUZnSOD mRNA
Zhu et al. (2008)	Time of mean escape latency and search strategy in spatial probe test in Morris water maze	• Reduced Noxa and caspase-3
Manni et al. (2009)	Passive avoidance response	• Increased NGF and BDNF
Wang et al. (2009)	Time of mean escape latency of the rats finding the platform and time spent in target quadrant in probe trial after platform trial and reversal trial in Morris water maze	• Reduced cell apoptosis, Bax protein and mRNA • Increased Bcl-2 protein and mRNA
Feng et al. (2010)	Time of escape latency, swimming speed, path length to the platform, percentage of target quadrant and number of crossing the platform in Morris water maze	• Reduced neuronal apoptosis and caspase-3 activity
Kim et al. (2011a)	Passive avoidance response	• Restored AchE activity
Wei et al. (2011)	Time of escape latency and frequency crossing platform quadrant in Morris water maze	• Promoted synaptophysin expression
Zhao et al. (2011)	Time of escape latency of hidden platform experiment in the Morris water maze	• Enhanced hexokinase, pyruvate kinase and glucose 6 phosphate dehydrogenase activities

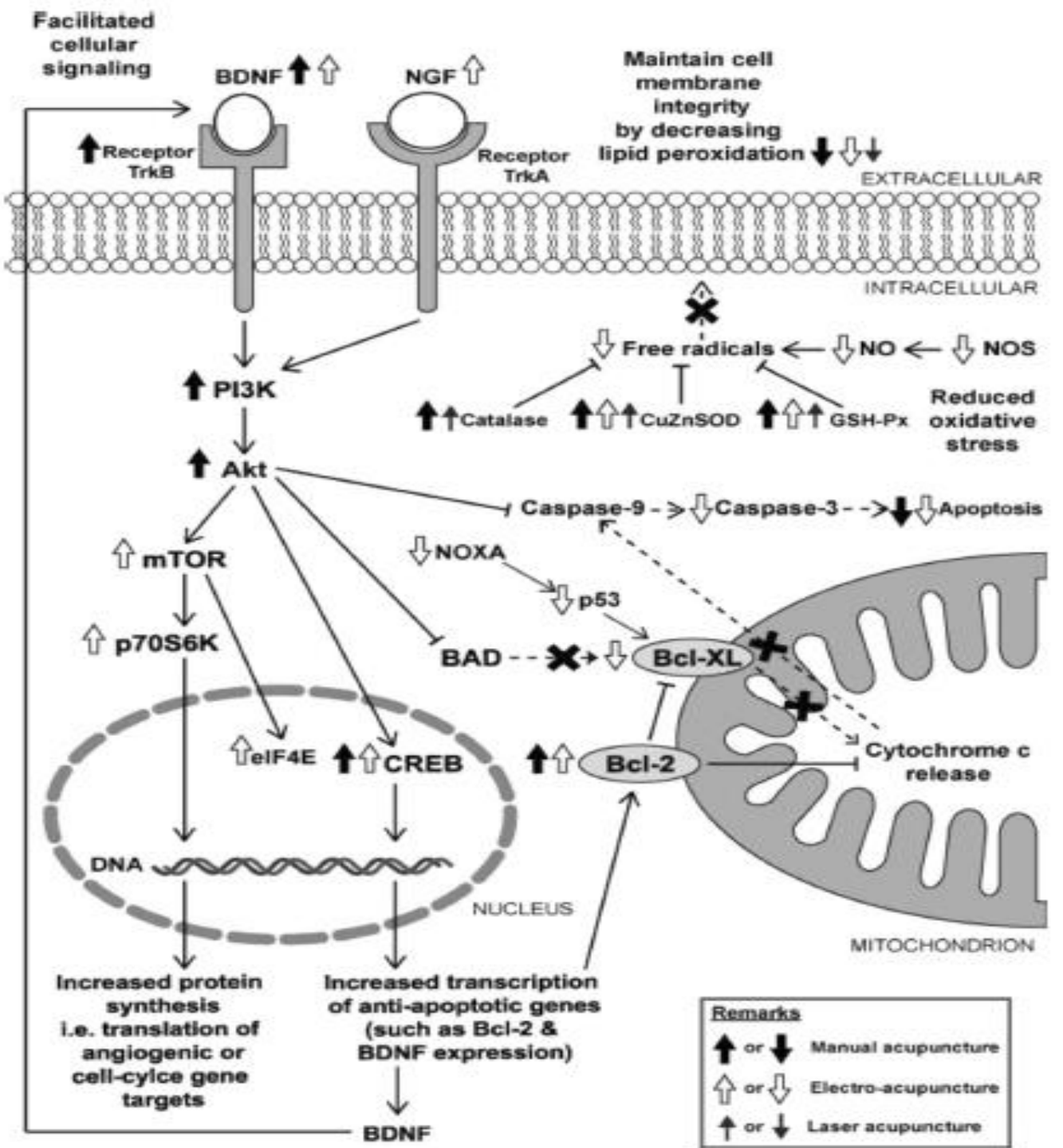
AchE acetylcholinesterase, *BDNF* brain-derived neurotrophic factor, *CAT* catalase, *ChAT* choline acetyltransferase, *CREB* cAMP-response element binding, *CUZnSOD* copper-zinc superoxide dismutase, *eIF4E* eukaryotic translation initiation factor 4E, *GSH-Px* glutathione peroxidase; Iba-1, ionizing calcium-binding adapter molecule, *MDA* malondialdehyde, *mTOR* mammalian target of rapamycin, *NGF* nerve growth factor, *NO* nitric oxide, *NOS* nitric oxide synthase, *pCREB* phosphorylated cAMP-response element binding, *p70S6K* p70 ribosomal protein S6 kinase, *SOD* superoxide dismutase, *ROS* reactive oxygen species

Chen et al. (2012)	Time of escape latency, swimming distance and swimming speed of hidden platform test together with percentage of target quadrant, retention time and number of crossing over the former platform of the probe test in the Morris water maze	• Reduced apoptosis, ROS, MDA and Iba-1 • Increased SOD
He (2012)	Latency and error frequency of step-down avoidance test	• Reduced NO level • Increased SOD activity
Jittiwat and Wattanathorn (2012)	Time of escape latency and retention of the hidden platform in the Morris water maze	• Reduced MDA • Increased SOD, CAT and GSH-Px
Lee et al. (2012)	Time of escape latency of visible platform and hidden platform, probe test and swimming speed in the Morris water maze	• Increased ChAT, AchE, BDNF and CREB protein
Zhu et al. (2012)	Time of mean escape latency and search strategy of hidden platform in the Morris water maze	• Increased p70S6K and ribosomal protein S6
Han et al. (2013)	Time of escape latency, swimming speed and frequency across the hidden platform in the Morris water maze	• Increased pCREB and Bcl-2 • Decreased Bax
Liu et al. (2013)	Time of escape latency and swimming distance of hidden platform test in the Morris water maze	• Reduced MDA • Increased SOD and GSH-Px
Sutalangka et al. (2013)	Time of escape latency and retention of the hidden platform in the Morris water maze	• Reduced MDA • Increased SOD, CAT, GSH-Px and AchE
Zhu et al. (2013)	Time of mean escape latency and search strategy of hidden platform in the Morris water maze	• Increased mTOR and eIF4E

AchE acetylcholinesterase, *BDNF* brain-derived neurotrophic factor, *CAT* catalase, *ChAT* choline acetyltransferase, *CREB* cAMP-response element binding, *CUZnSOD* copper-zinc superoxide dismutase, *eIF4E* eukaryotic translation initiation factor 4E, *GSH-Px* glutathione peroxidase; Iba-1, ionizing calcium-binding adapter molecule, *MDA* malondialdehyde, *mTOR* mammalian target of rapamycin, *NGF* nerve growth factor, *NO* nitric oxide, *NOS* nitric oxide synthase, *pCREB* phosphorylated cAMP-response element binding, *p70S6K* p70 ribosomal protein S6 kinase, *SOD* superoxide dismutase, *ROS* reactive oxygen species


Parkinson's Disease
Vascular Dementia
Alzhemier's Disease
Cerebral ischemia or infarction
Impaired cell signaling
Increased apoptosis process
Increased oxidative stress
Reduced cerebral blood flow and energy
Diminished synaptic transmission
Impaired cognitive function
Acupuncture-related treatment
Facilitated cellular signaling
Reduced loss of tyrosine kinase receptor
Trigger PI3K/Akt signaling
Regulated apoptosis process
Reduced apoptosis-related activity (such as NOXA, p53 & caspase-3)
Inhibit BAX expression
Enhance Bcl-2 expression
Reduced oxidative stress
Reduced NO-related generation
More scavenging of free radicals by increasing SOD & GSH-Px expressions & activities
Reduce free radical attack on cell membrane
Stabilized energy metabolism
Stabilize energy metabolism by enhancing hexokinase, pyruvate kinase & G-6-P dehydrogenase
Restored synaptic transmission
Maintain a steady production of dopamine
Promote synaptophysin expression
Restore AchE activity
Modulated neuronal survival and function
Improved cognitive function

IPOTESI SULLA CORRELAZIONE FRA GLI EFFETTI POSITIVI DELL'AGOPUNTURA E LA SOPRAVVIVENZA NEURONALE NELLE MALATTIE NEURODEGENERATIVE



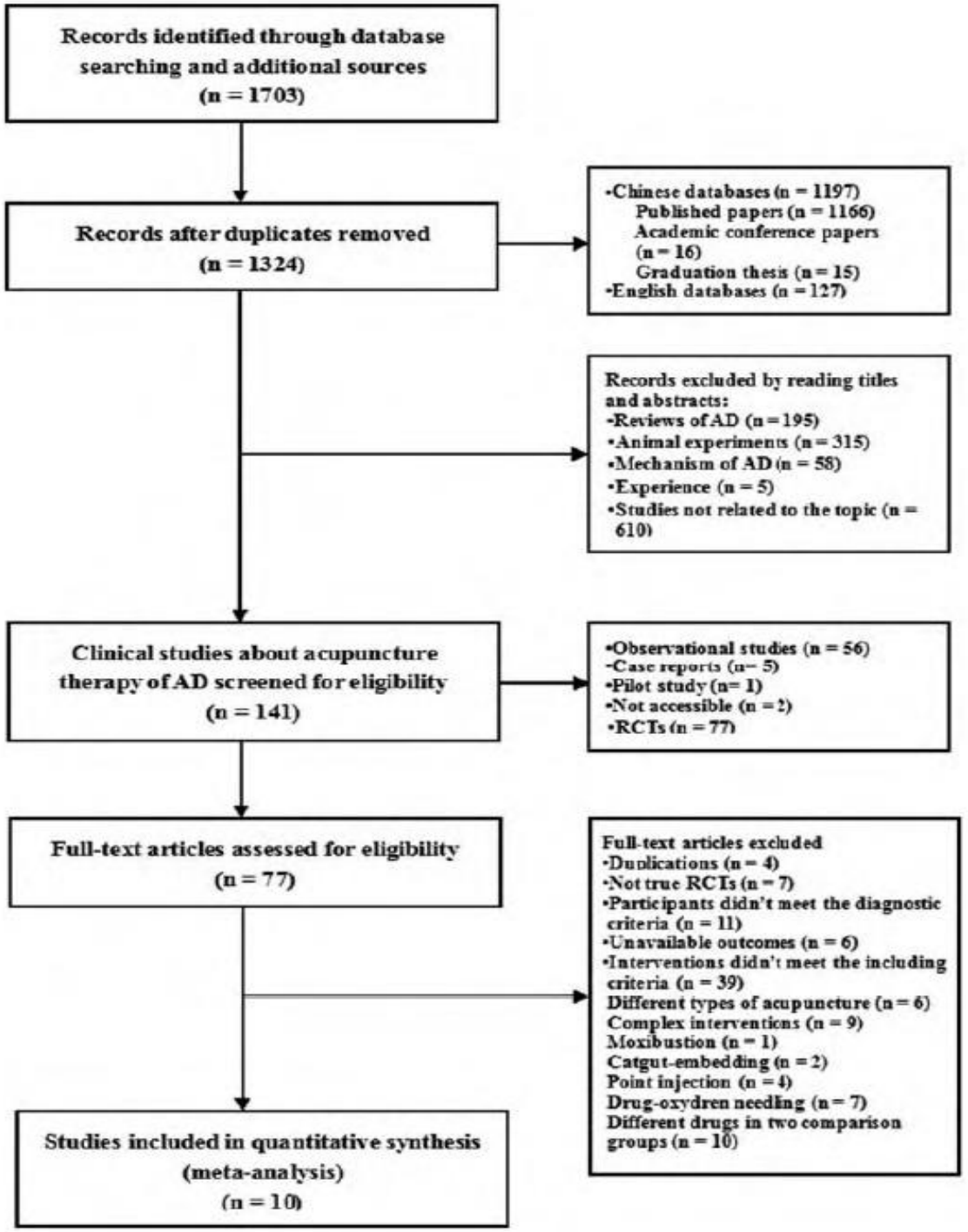
The Effectiveness and Safety of Acupuncture for Patients With Alzheimer Disease

A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Jing Zhou, MM, Weina Peng, MM, Min Xu, MD, Wang Li, MM, and Zhishun Liu, MD

GLI AUTORI HANNO OPERATO UNA RASSEGNA SISTEMATICA SULL'USO DELL'AGOPUNTURA NELA CURA DEL PAZIENTE CON MALATTIA DI ALZHEIMER.
LA PRIMA ANALISI DELLA LETTERATURA HA FORNITO 1703 VOCI BIBLIOGRAFICHE ED ALLA FINE DELLA SELEZIONE SONO RIMASTI 10 TRIAL CLNICI PER UN TOTALE DI 585 PAZIENTI.

DOPO LE DUE PRIME SELEZIONI SONO RIMASTI 141 TRIAL CLINICI CHE DOPO ALTRE DUE SELEZIONI SI SONO RIDOTTI A 10.



I RISULTATI SONO STATI VALUTATI CON I SEGUENTI STRUMENTI:

-ADL – ABILITY OF DAILY LIVING

-HDS – HASEGAWA'S DEMENTIA SCALE

-HDS-R - REVISED HASEGAWA'S DEMENTIA SCALE

-ADAS-cog – ALZHEIMER'S DISEASE ASSESSMENT SCALE COGNITION

-MMSE – MINI MENTAL STATE EXAMINATION

-MoCA – MONTREAL COGNITIVE ASSESSMENT

Reference	Comparisons	Methods	Course, wk	Outcomes
Lin et al[17]	Electroacupuncture, 18 Donepezil, 18	Random number table Adequate allocation concealment Outcome assessors blinded	12	MMSE, ADL ADAS-cog
Liu et al[18]	Acupuncture, 40 Almitrine and raubasine, 40	Random number table Allocation concealment: unclear Blinding of outcome assessors: unclear	10	MMSE, HDS
Luo et al[19]	Electroacupuncture, 49 Dihydroergotoxine, 48	Process of randomization: unclear Allocation concealment: unclear Blinding of outcome assessors: unclear	12	MMSE
Zhao et al[20]	Acupuncture, 16 Nimodipine, 16	Process of randomization: unclear Allocation concealment: unclear Blinding of outcome assessors: unclear	8	MMSE, ADL, HDS-R, FAQ
Jia et al[21]	Acupuncture, 25 Piracetam, 26	Process of randomization: unclear Allocation concealment: unclear Blinding of outcome assessors: unclear	12	MMSE, ADL
Ke YM, MD, unpublished data, June 2014	Acupuncture, 32 Donepezil, 32	Random number table Allocation concealment: unclear Blinding of outcome assessors: unclear	4	MMSE, ADL
Zou and Yang[22]	Electroacupuncture plus donepezil, 20 Donepezil, 18	Process of randomization: unclear Allocation concealment: unclear Blinding of outcome Assessors: unclear	12	MMSE, ADL, MoCA
Jin[23]	Acupuncture plus donepezil, 26 Donepezil, 26	Process of randomization: unclear Allocation concealment: unclear Blinding of outcome assessors: unclear	4	MMSE, ADL
Wang[24]	Scalp acupuncture plus donepezil, 27 Donepezil, 28	Random number table Allocation concealment: unclear Blinding of outcome assessors: unclear	3	MMSE, ADAS-cog
Hu et al[25]	Acupuncture, 40 No treatment, 40	Random number table Adequate allocation concealment Outcome assessors blinded	24	MMSE, ADL

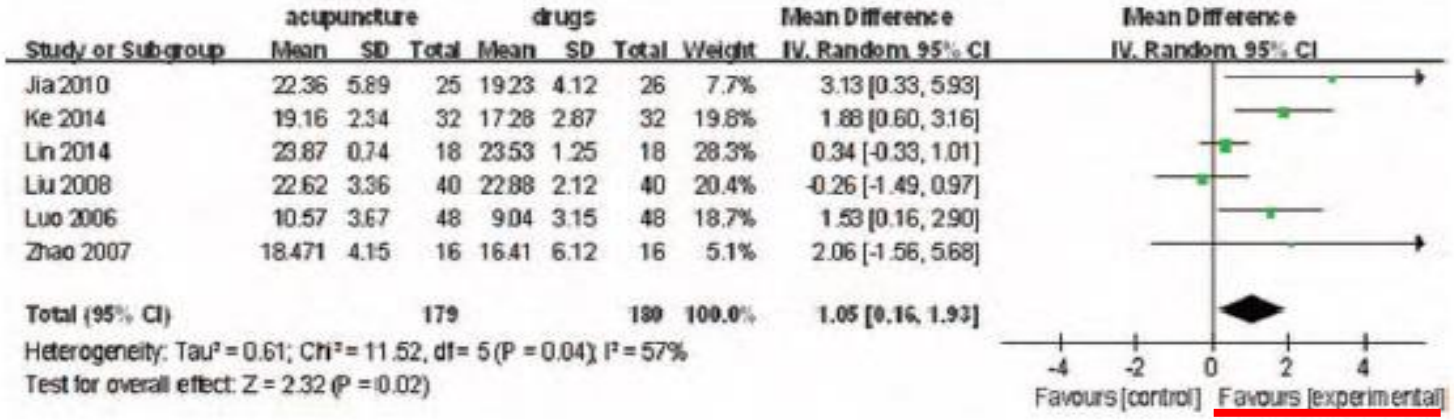


FIGURE 2. Forest plot of the effect of acupuncture versus drugs on the MMSE score using the random model. MMSE = Mini Mental State Examination.

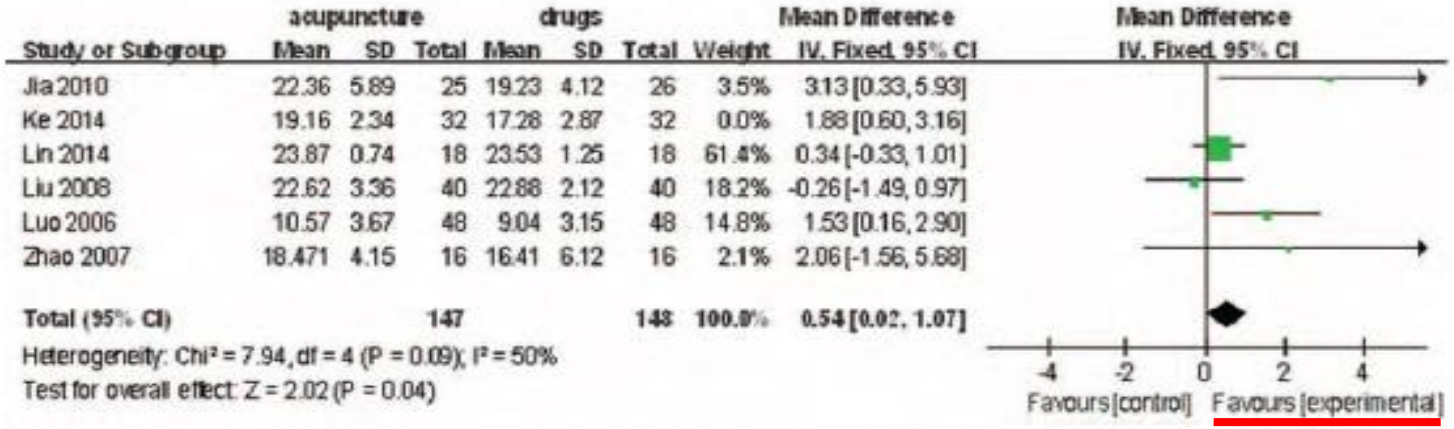


FIGURE 3. Forest plot of the effect of acupuncture versus drugs on the MMSE score using the fixed model. MMSE = Mini Mental State Examination.

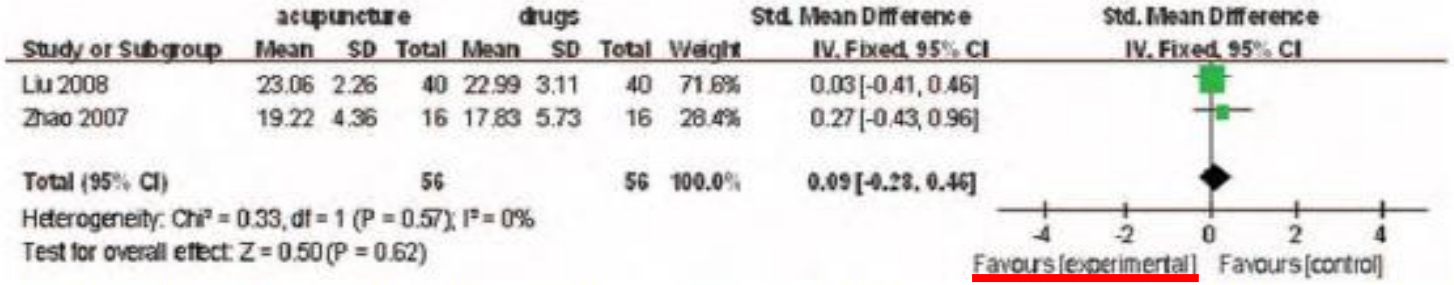


FIGURE 4. Forest plot of the effect of acupuncture versus drugs on the HDS score. HDS=Hasegawa's Dementia Scale.

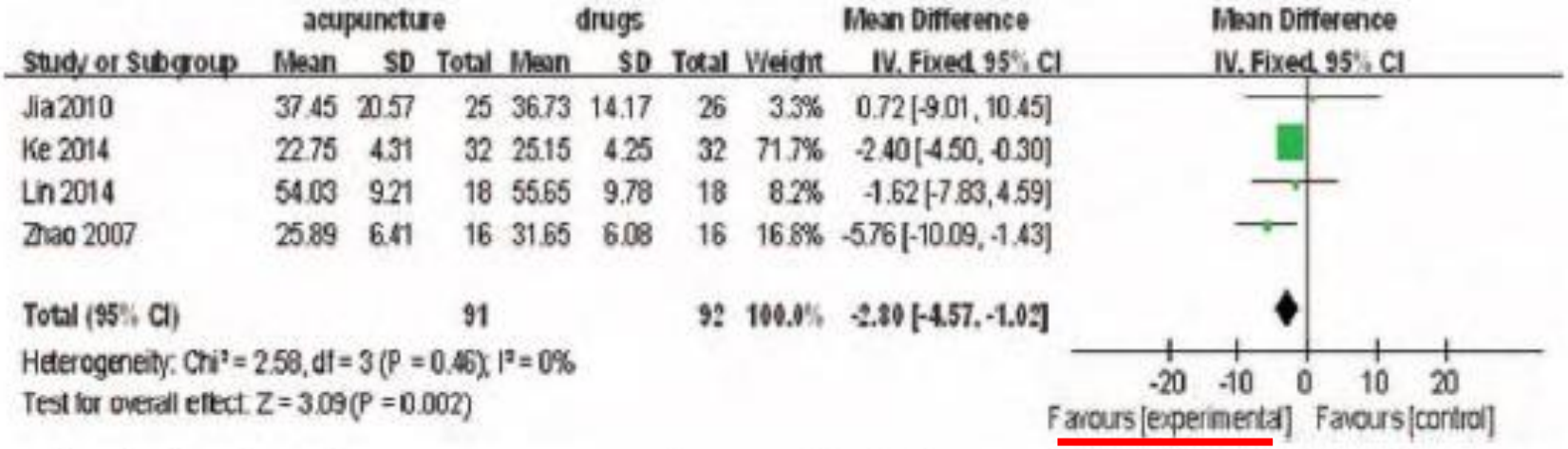


FIGURE 6. Forest plot of the effect of acupuncture versus drugs on the ADL score. ADL = ability of daily living.

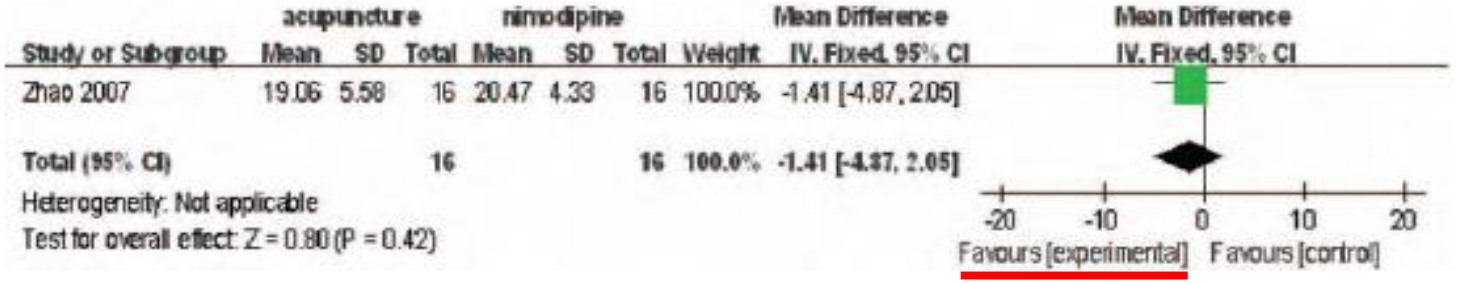


FIGURE 7. Forest plot of the effect of acupuncture versus drugs on the FAQ score. FAQ = functional activities questionnaire.

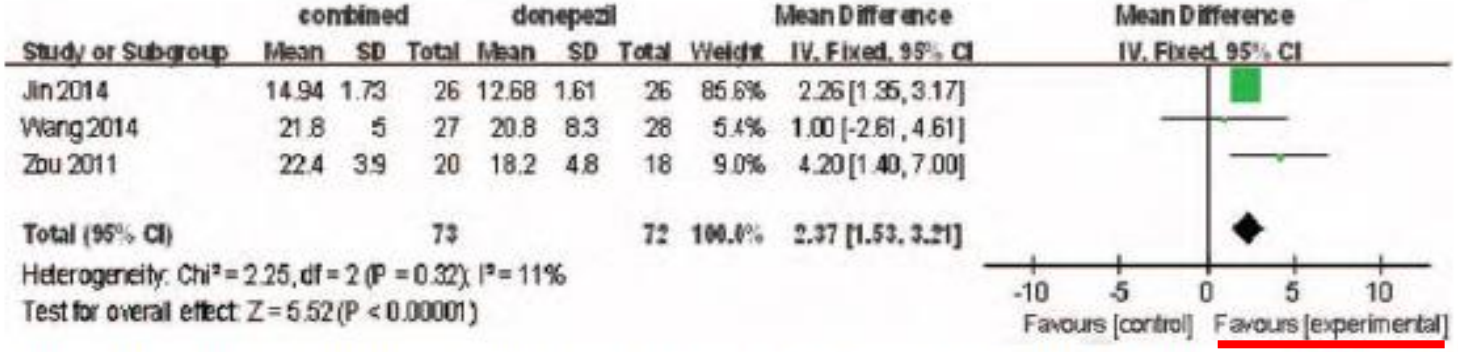


FIGURE 8. Forest plot of the effect of acupuncture plus donepezil versus donepezil alone on the MMSE score. MMSE = Mini Mental State Examination.

CONCLUSIONS

In conclusion, the results of the meta-analysis indicate that acupuncture may be more effective than drugs, and may also enhance the effect of donepezil in improving the cognitive function of patients with AD.

Acupuncture might also be more effective than drugs in improving the ability of daily living of patients with AD. Moreover, acupuncture is safe for treating patients with AD.

For future research, the process of randomization and allocation concealment must be rigorously controlled and described, and more detailed methodologies need to be reported.

Cochrane Library

Cochrane Database of Systematic Reviews

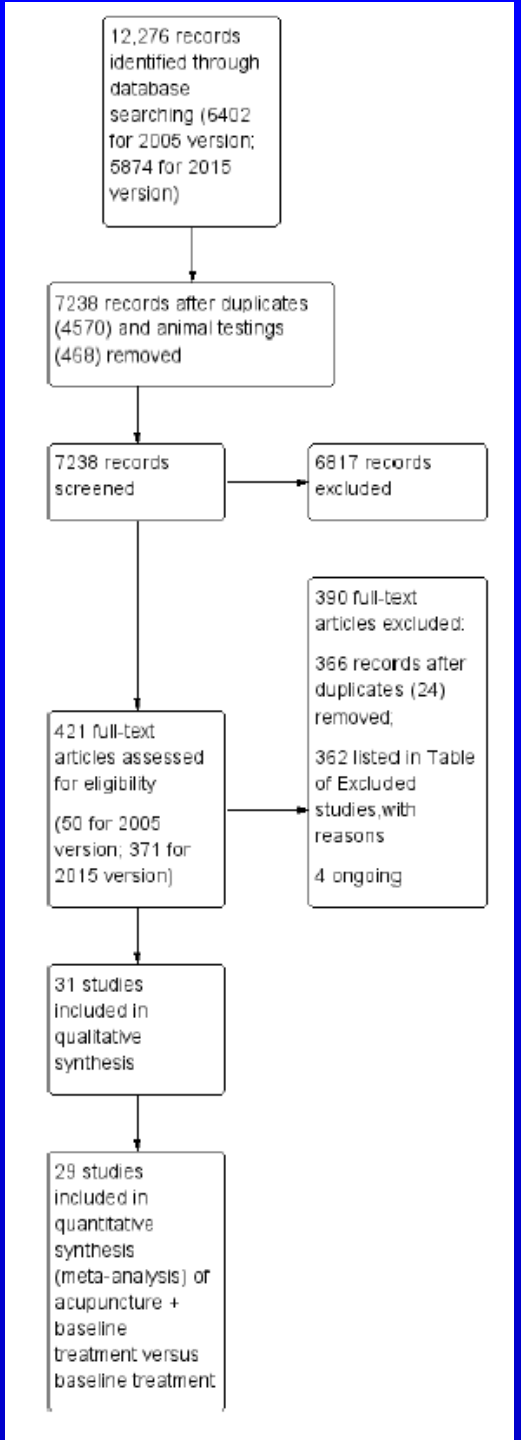
Acupuncture for stroke rehabilitation (Review)

Yang A, Wu HM, Tang JL, Xu L, Yang M, Liu GJ

IN QUESTA RASSEGNA SISTEMATICA GLI AUTORI HANNO INDIVIDUATO 12276 RECORDS ED ALLA FINE HANNO SELEZIONATO 31 TRIALS CLINICI SU AGOPUNTURA E STROKE.
PER ILLUSTRARE METODI, DATI E CONCLUSIONI HANNO STESO UNA RELAZIONE DI 155 PAGINE. VI E' ETEROGENICITA' SIA NELLA TIPOLOGIA DI PAZIENTI, (INTERVENTO DOPO UNO O DUE O TRE MESI DALL'ICTUS ETC.) SIA NELLE PROCEDURE AGOPUNTURALI.

GLI AUTORI HANNO OPERATO UNA NOTEVOLE SELEZIONE: SONO PARTITI DA 12.276 VOCI ED HANNO SELEZIONATO 31 TRIALS CLINICI PER UN TOTALE DI 2257 PAZIENTI.

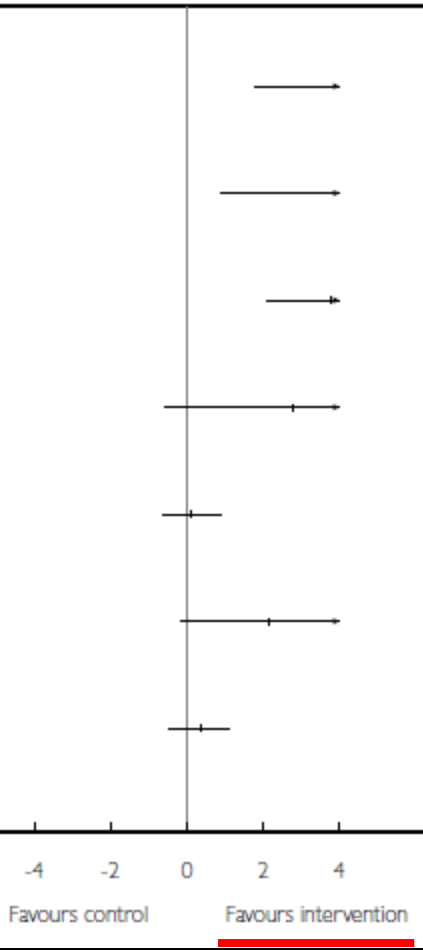
RIPORTIAMO SOLAMENTE ALCUNI CONFRONTI PER DARE L'IDEA DELLA POSITIVITA' DEL TRATTAMENTO AGOPUNTURALE



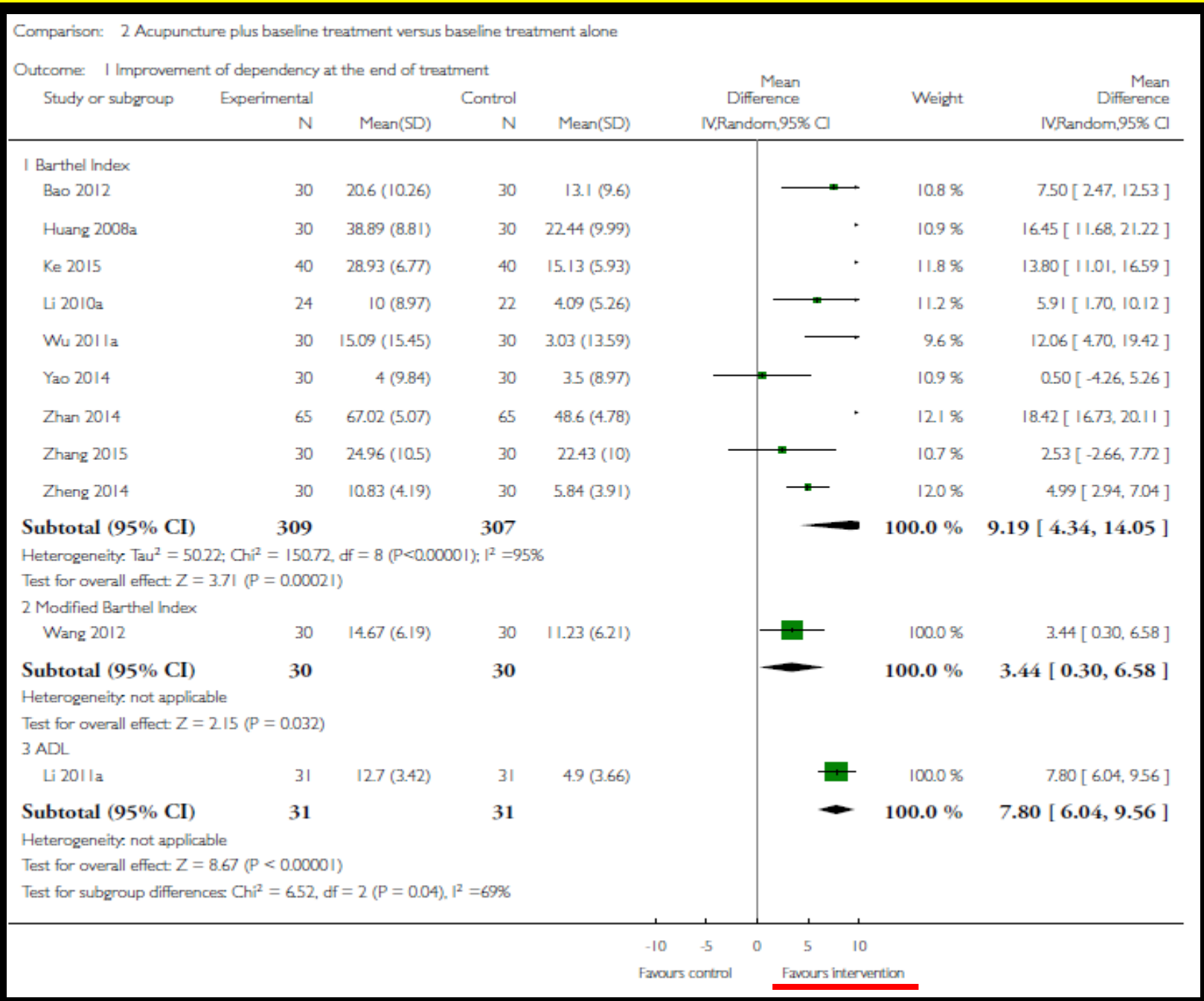
Comparison: 1 Acupuncture plus baseline treatment versus sham acupuncture plus baseline treatment

Outcome: 2 Improvement of cognitive function

Study or subgroup	Acupuncture N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
1 Orientation						
Chou 2009	17	4.65 (4.42)	16	0.44 (2.48)		4.21 [1.78, 6.64]
2 Perception						
Chou 2009	17	4.94 (6.86)	16	-0.38 (5.99)		5.32 [0.93, 9.71]
3 Praxis						
Chou 2009	17	3.12 (2.54)	16	-0.68 (2.38)		3.80 [2.12, 5.48]
4 Visuomotor organisation						
Chou 2009	17	1.82 (5.17)	16	-0.94 (4.61)		2.76 [-0.58, 6.10]
5 Thinking operation						
Chou 2009	17	0.06 (1.38)	16	-0.06 (0.77)		0.12 [-0.64, 0.88]
6 Memory						
Chou 2009	17	1.7 (3.18)	16	-0.44 (3.55)		2.14 [-0.16, 4.44]
7 Attention						
Chou 2009	17	0.29 (1.22)	16	-0.06 (1.05)		0.35 [-0.43, 1.13]



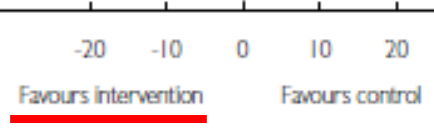
AGOPUNTURA E STRESS OSSIDATIVO


Comparison: 2 Acupuncture plus baseline treatment versus baseline treatment alone
Outcome: 1 Improvement of dependency at the end of treatment
Study or subgroup
Experimental N Mean(SD)
Control N Mean(SD)
Mean Difference IV,Random,95% CI
Weight
Mean Difference IV,Random,95% CI
1 Barthel Index
Bao 2012 30 20.6 (10.26) 30 13.1 (9.6) 10.8 % 7.50 [2.47, 12.53]
Huang 2008a 30 38.89 (8.81) 30 22.44 (9.99) 10.9 % 16.45 [11.68, 21.22]
Ke 2015 40 28.93 (6.77) 40 15.13 (5.93) 11.8 % 13.80 [11.01, 16.59]
Li 2010a 24 10 (8.97) 22 4.09 (5.26) 11.2 % 5.91 [1.70, 10.12]
Wu 2011a 30 15.09 (15.45) 30 3.03 (13.59) 9.6 % 12.06 [4.70, 19.42]
Yao 2014 30 4 (9.84) 30 3.5 (8.97) 10.9 % 0.50 [-4.26, 5.26]
Zhan 2014 65 67.02 (5.07) 65 48.6 (4.78) 12.1 % 18.42 [16.73, 20.11]
Zhang 2015 30 24.96 (10.5) 30 22.43 (10) 10.7 % 2.53 [-2.66, 7.72]
Zheng 2014 30 10.83 (4.19) 30 5.84 (3.91) 12.0 % 4.99 [2.94, 7.04]
Subtotal (95% CI) 309 307 100.0 % 9.19 [4.34, 14.05]
Heterogeneity: Tau² = 50.22; Chi² = 150.72, df = 8 (P<0.00001); I² =95%
Test for overall effect: Z = 3.71 (P = 0.00021)
2 Modified Barthel Index
Wang 2012 30 14.67 (6.19) 30 11.23 (6.21) 100.0 % 3.44 [0.30, 6.58]
Subtotal (95% CI) 30 30 100.0 % 3.44 [0.30, 6.58]
Heterogeneity: not applicable
Test for overall effect: Z = 2.15 (P = 0.032)
3 ADL
Li 2011a 31 12.7 (3.42) 31 4.9 (3.66) 100.0 % 7.80 [6.04, 9.56]
Subtotal (95% CI) 31 31 100.0 % 7.80 [6.04, 9.56]
Heterogeneity: not applicable
Test for overall effect: Z = 8.67 (P < 0.00001)
Test for subgroup differences: Chi² = 6.52, df = 2 (P = 0.04), I² =69%
-10 -5 0 5 10
Favours control
Favours intervention

Comparison: 2 Acupuncture plus baseline treatment versus baseline treatment alone

Outcome: 3 Improvement of global neurological deficit at the end of treatment

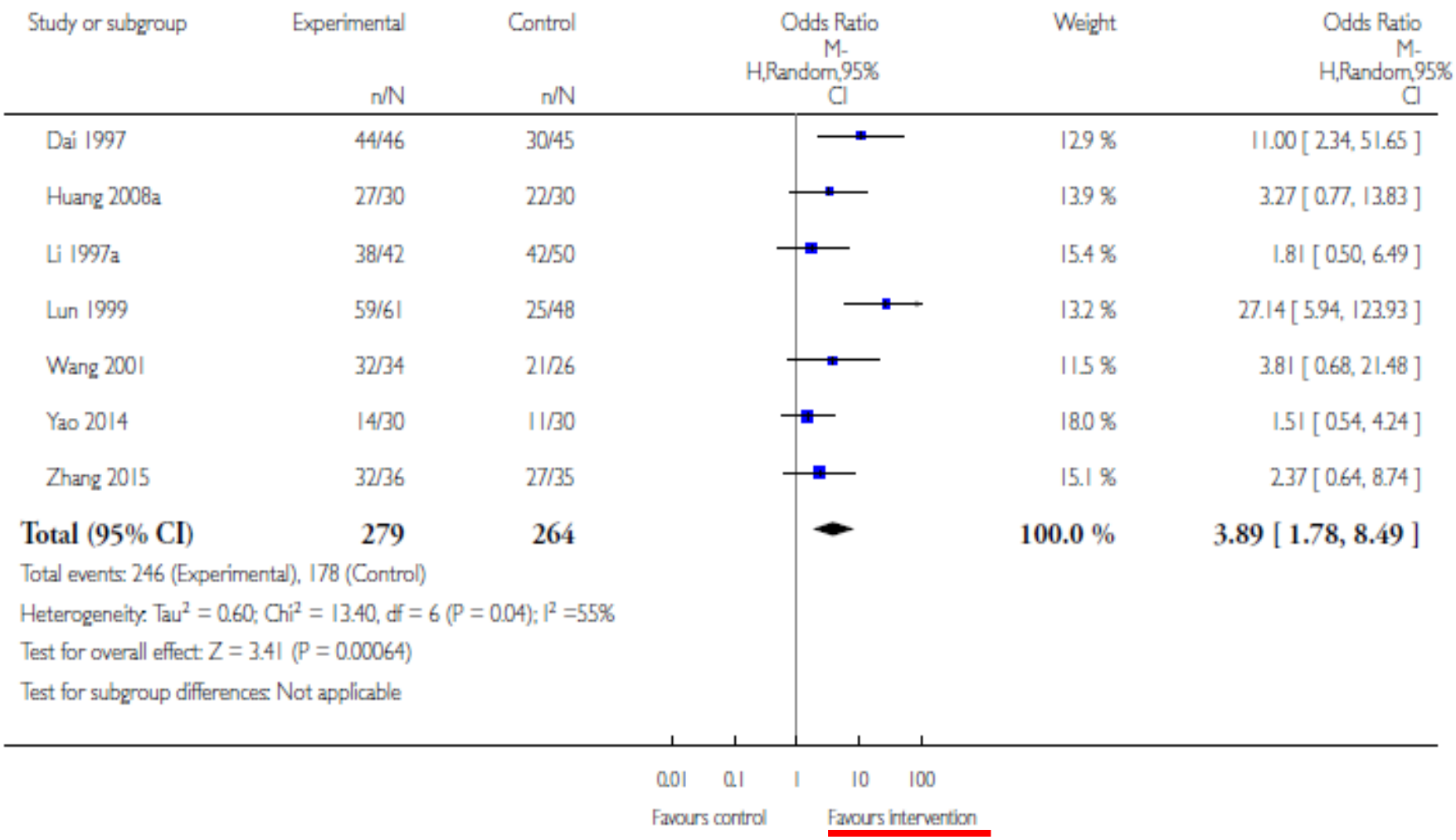
Study or subgroup	Experimental N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Random,95% CI	Weight	Mean Difference IV,Random,95% CI
1 Modified Edinburgh and Scandinavian Stroke Scale							
Gao 2014a	30	-9.97 (4.57)	30	-7.8 (4.65)		14.6 %	-2.17 [-4.50, 0.16]
Zhang 2015	30	-4.78 (3.51)	30	-3.68 (2.91)		26.2 %	-1.10 [-2.73, 0.53]
Zhu 2007	30	-7.79 (2.58)	30	-4.54 (3.62)		27.2 %	-3.25 [-4.84, -1.66]
Huang 2008a	30	-6.48 (2.7)	30	-3.68 (2.91)		32.1 %	-2.80 [-4.22, -1.38]
Subtotal (95% CI)	**120**		**120**			**100.0 %**	**-2.39 [-3.34, -1.43]**
Heterogeneity: $Tau^2 = 0.22$; $Chi^2 = 3.88$, df = 3 (P = 0.27); I^2 =23%							
Test for overall effect: Z = 4.89 (P < 0.00001)							
2 Neurological function deficit scale							
Guo 2011	32	-14.86 (42)	31	-6.31 (5.81)		9.5 %	-8.55 [-23.25, 6.15]
Yao 2014	30	-1.43 (1.44)	30	-1.2 (1.27)		90.5 %	-0.23 [-0.92, 0.46]
Subtotal (95% CI)	**62**		**61**			**100.0 %**	**-1.02 [-5.80, 3.76]**
Heterogeneity: $Tau^2 = 6.44$; $Chi^2 = 1.23$, df = 1 (P = 0.27); I^2 =19%							
Test for overall effect: Z = 0.42 (P = 0.68)							
Test for subgroup differences: $Chi^2 = 0.30$, df = 1 (P = 0.58), I^2 =0.0%							



AGOPUNTURA E STRESS OSSIDATIVO

Comparison: 2 Acupuncture plus baseline treatment versus baseline treatment alone

Outcome: 5 Improvement of global neurological deficit at the end of treatment



AGOPUNTURA E STRESS OSSIDATIVO

Comparison: 2 Acupuncture plus baseline treatment versus baseline treatment alone

Outcome: 6 Improvement of motor function at the end of treatment

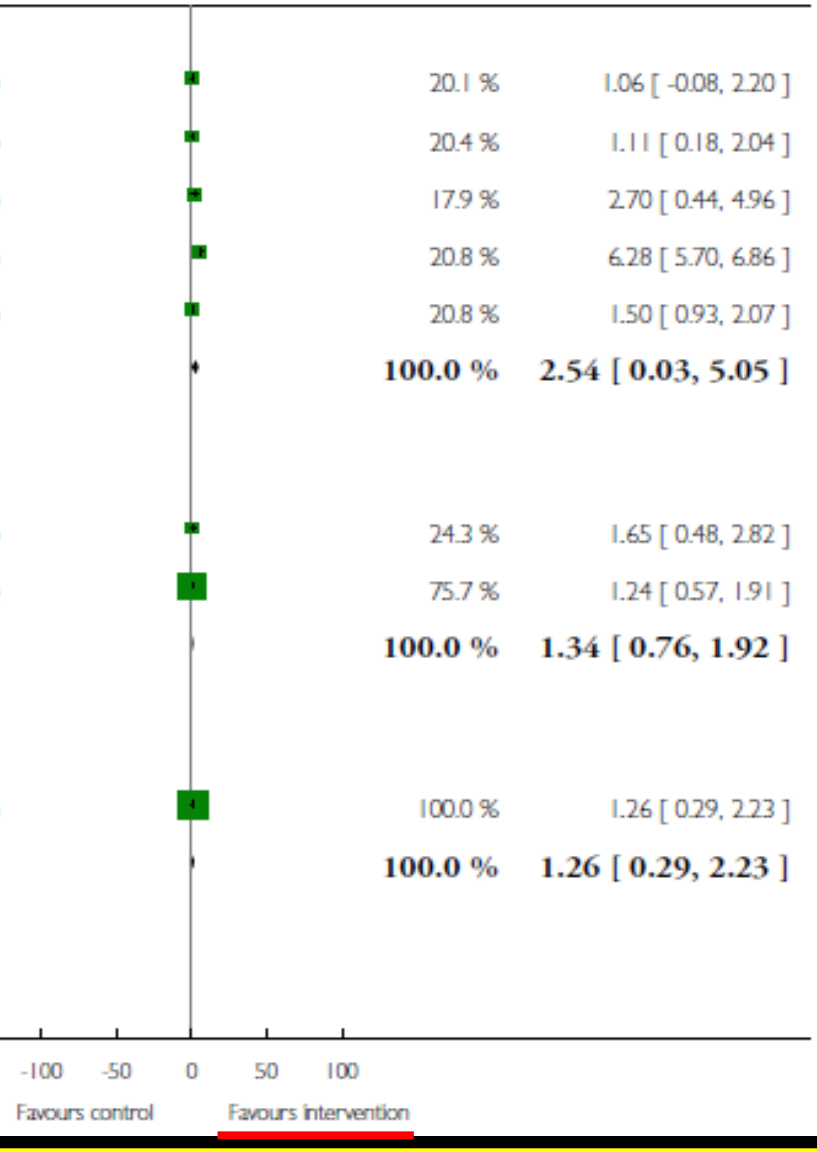
Study or subgroup	Acupuncture N	Acupuncture Mean(SD)	Control N	Control Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
1 Upper and lower extremities motor function(Fugl-Meyer Assessment)							
Li 2013a	20	25.05 (14.1)	20	21.9 (9.89)		6.7 %	3.15 [-4.40, 10.70]
Wang 2011a	43	12.52 (7.4)	42	5.9 (4.29)		58.1 %	6.62 [4.06, 9.18]
Wu 2011a	30	10.83 (10.53)	30	0.92 (10.55)		13.4 %	9.91 [4.58, 15.24]
Yao 2014	30	9.53 (9.89)	30	6 (6.25)		21.8 %	3.53 [-0.66, 7.72]
Subtotal (95% CI)	**123**		**122**			**100.0 %**	**6.16 [4.20, 8.11]**
Heterogeneity: Chi² = 4.15, df = 3 (P = 0.25); I² =28%							
Test for overall effect: Z = 6.17 (P < 0.00001)							
2 General motor function (Motor assessment scale)							
Wang 2012	30	8.23 (3.11)	30	3.7 (2.96)		100.0 %	4.53 [2.99, 6.07]
Subtotal (95% CI)	**30**		**30**			**100.0 %**	**4.53 [2.99, 6.07]**
Heterogeneity: not applicable							
Test for overall effect: Z = 5.78 (P < 0.00001)							
Test for subgroup differences: Chi² = 1.64, df = 1 (P = 0.20), I² =39%							

AGOPUNTURA E STRESS OSSIDATIVO

Comparison: 2 Acupuncture plus baseline treatment versus baseline treatment alone

Outcome: 9 Improvement of cognitive function at the end of treatment

Study or subgroup	Experimental N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Random,95% CI	Weight	Mean Difference IV,Random,95% CI
1 MMSE							
Bao 2012	30	2.49 (2.31)	30	1.43 (2.2)		20.1 %	1.06 [-0.08, 2.20]
Li 2010a	24	3.25 (1.96)	22	2.14 (1.21)		20.4 %	1.11 [0.18, 2.04]
Li 2011a	31	5.8 (4.89)	31	3.1 (4.15)		17.9 %	2.70 [0.44, 4.96]
Liu 2013a	25	15.08 (1.14)	25	8.8 (0.96)		20.8 %	6.28 [5.70, 6.86]
Zheng 2014	30	3.96 (1.13)	30	2.46 (1.12)		20.8 %	1.50 [0.93, 2.07]
Subtotal (95% CI)	**140**		**138**			**100.0 %**	**2.54 [0.03, 5.05]**
Heterogeneity: $Tau^2 = 7.81$; $Chi^2 = 173.93$, df = 4 (P<0.00001); I^2 =98%							
Test for overall effect: Z = 1.98 (P = 0.047)							
2 MoCA							
Bao 2012	30	3.14 (2.41)	30	1.49 (2.23)		24.3 %	1.65 [0.48, 2.82]
Zheng 2014	30	4.07 (1.19)	30	2.83 (1.43)		75.7 %	1.24 [0.57, 1.91]
Subtotal (95% CI)	**60**		**60**			**100.0 %**	**1.34 [0.76, 1.92]**
Heterogeneity: $Tau^2 = 0.0$; $Chi^2 = 0.35$, df = 1 (P = 0.55); I^2 =0.0%							
Test for overall effect: Z = 4.53 (P < 0.00001)							
3 HDS-R							
Li 2010a	24	3.06 (1.84)	22	1.8 (1.52)		100.0 %	1.26 [0.29, 2.23]
Subtotal (95% CI)	**24**		**22**			**100.0 %**	**1.26 [0.29, 2.23]**
Heterogeneity: not applicable							
Test for overall effect: Z = 2.54 (P = 0.011)							
Test for subgroup differences: $Chi^2 = 0.89$, df = 2 (P = 0.64), I^2 =0.0%							



CONCLUSIONI

- From the available evidence, acupuncture may have beneficial effects on improving dependency, global neurological deficiency, and some specific neurological impairments for people with stroke in the convalescent stage, with no obvious serious adverse events.

- However, most included trials were of inadequate quality and size. There is, therefore, inadequate evidence to draw any conclusions about its routine use. Rigorously designed, randomised, multi-centre, large sample trials of acupuncture for stroke are needed to further assessits effects.

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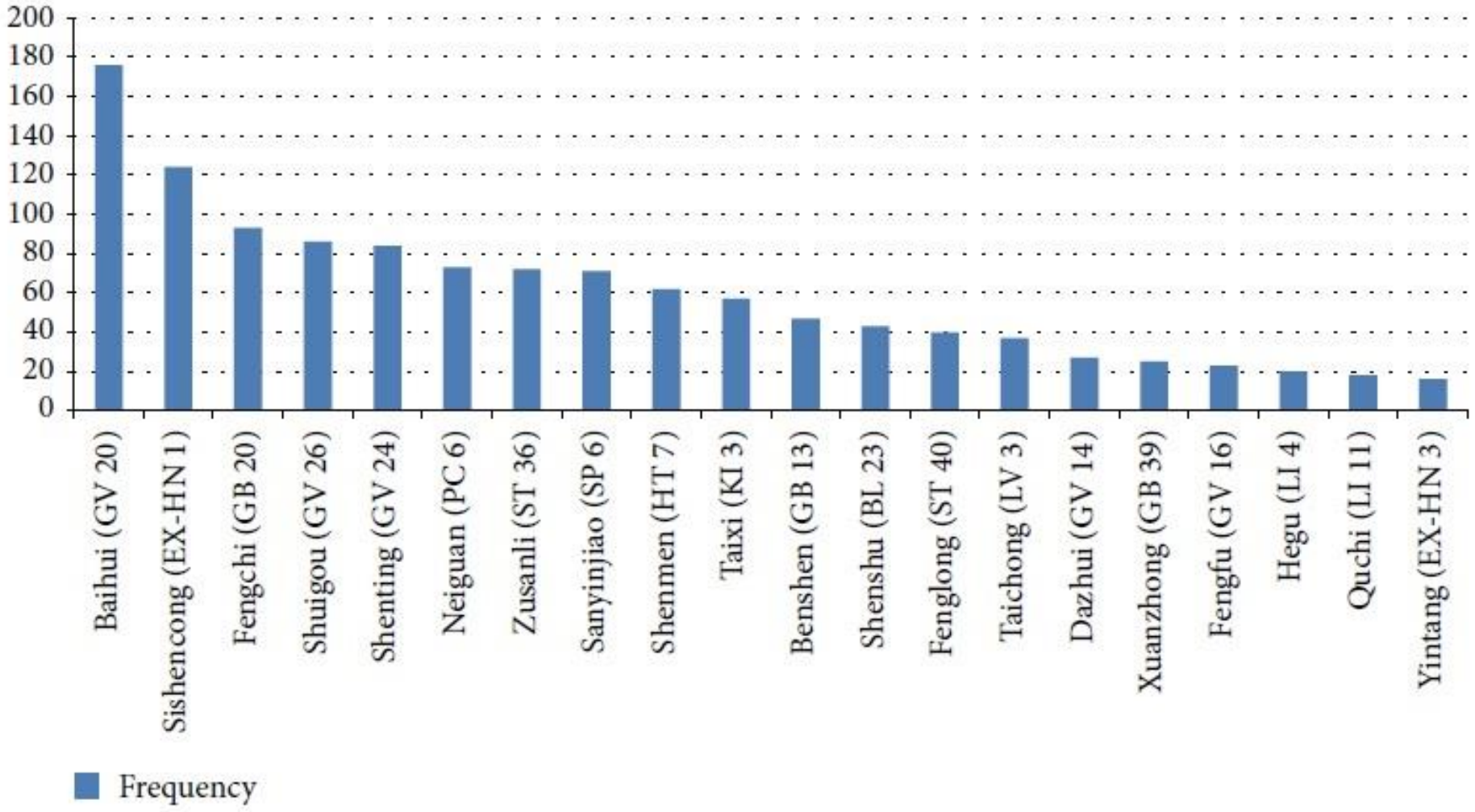
Discovery of Acupoints and Combinations with Potential to Treat Vascular Dementia: A Data Mining Analysis

Shuwei Feng, Yulan Ren, Shilin Fan, Minyu Wang, Tianxiao Sun,
Fang Zeng, Ping Li, and Fanrong Liang

IN QUESTA INDAGINE SONO STATI RACCOLTI I PUNTI DI AGOPUNTURA PRESENTI IN LETTERATURA IN MOLTI DATA BASE, RIGUARDANTI LA CURA DELLA DEMENZA VASCOLARE. SONO STATI INDIVIDUATI 2121 TRIALS DI CUI NE SONO STATI SELEZIONATI 238.
I CRITERI DI ESCLUSIONE SONO STATI NUMEROSI: SOLO TRIALS DI MTC, SOLO I PUNTI DI QUELLI CON RISULTATI POSITIVI, SOLO TRATTATI CON AGO, MAN. O EAP, NO AL TRATTAMENTO CON FARMACI ETC.

SONO STATI INDIVIDUATI 109 PUNTI SUI MERIDIANI CLASSICI E 7 PUNTI FUORI MERIDIANO.
LA FREQUENZA DI UTILIZZO E' LA SEGUENTE:



Frequency	Number of acupoints	Acupoints and their frequencies
477	26	Baihui (GV 20) 176, Shuigou (GV 26) 86, Shenting (GV 24) 84, Dazhui (GV 14) 27, Fengfu (GV 16) 23, Yintang (EX-HN 3) 16, Naohu (GV 17) 13, Shangxing (GV 23) 11, Mingmen (GV 4) 8, Yamen (GV 15) 5, Qiangjian (GV 18) 5, Qianding (GV 21) 4, Yaoyangguan (GV 3) 3, Zhiyang (GV 9) 3, Jinsuo (GV 8) 2, Shendao (GV 11) 1, Zhongshu (GV 7) 1, Taodao (GV 13) 1, Lingtai (GV 10) 1, Changqiang (GV 1) 1, Xuanshu (GV 5) 1, Yaoshu (GV 2) 1, Shenzhu (GV 12) 1, Jizhong (GV 6) 1, Houding (GV 19) 1, Xinhui (GV 22) 1
218	20	Fengchi (GB 20) 93, Benshen (GB 13) 47, Xuanzhong (GB 39) 24, Shuaigu (GB 8) 7, Wangu (GB 12) 6, Toulinqi (GB 15) 6, Qubin (GB 7) 5, Xuanli (GB 6) 4, Naokong (GB 19) 4, Zuqiaoyin (GB 44) 3, Yanglingquan (GB 34) 3, Yangbai (GB 14) 3, Hanyan (GB 4) 2, Qiuxu (GB 40) 2, Fengshi (GB 31) 2, Touqiaoyin (GB 11) 2, Xuanlu (GB 5) 2, Muchuang (GB 16) 1, Zhengying (GB 17) 1, Zhongdu (GB 32) 1
133	7	Sishencong (EX-HN 1) 123, Taiyang (EX-HN 5) 4, Wailaogong (EX-UE 8) 2, Shiqizhui (EX-B 8) 1, Baxie (EX-UE 9) 1, Anmian (EX-HN 22) 1, Yiming (EX-HN 14) 1
124	7	Zusanli (ST 36) 72, Fenglong (ST 40) 40, Touwei (ST 8) 6, Lidui (ST 45) 2, Sibai (ST 2) 2, Futu (ST 32) 1, Renying (ST 9) 1
103	15	Shenshu (BL 23) 43, Ganshu (BL 18) 12, Tianzhu (BL 10) 10, Pishu (BL 20) 8, Feiyang (BL 58) 8, Geshu (BL 17) 7, Xinshu (BL 15) 4, Zhiyin (BL 67) 2, Kunlun (BL 60) 2, Yuzhen (BL 9) 2, Tongtian (BL 7) 1, Chengjin (BL 56) 1, Dazhu (BL 11) 1, Weizhong (BL 40) 1, Qucha (BL 4) 1
96	5	Sanyinjiao (SP 6) 71, Xuehai (SP 10) 14, Taibai (SP 3) 8, Yinbai (SP 1) 2, Yinlingquan (SP 9) 1
86	5	Neiguan (PC 6) 73, Zhongchong (PC 9) 4, Daling (PC 7) 4, Jianshi (PC 5) 3, Laogong (PC 8) 2
83	5	Taixi (KI 3) 57, Dazhong (KI 4) 12, Yongquan (KI 1) 10, Zhaohai (KI 6) 8, Rangu (KI 2) 2
67	3	Shenmen (HT 7) 62, Shaochong (HT 9) 3, Jiquan (HT 1) 2
45	7	Hegu (LI 4) 20, Quchi (LI 11) 18, Shangyang (LI 1) 2, Shousanli (LI 10) 2, Binao (LI 14) 1, Jianyu (LI 15) 1, Yingxiang (LI 20) 1
43	5	Qihai (CV 6) 11, Zhongwan (CV 12) 10, Guanyuan (CV 4) 9, Danzhong (CV 17) 9, Shenque (CV 8) 4
40	2	Taichong (LV 3) 37, Dadun (LV 1) 3
11	5	Waiguan (TE 5) 6, Guanchong (TE 1) 2, Sizhukong (TE 23) 1, Jiaosun (TE 20) 1, Sidu (TE 9) 1
4	2	Shaoshang (LU 11) 3, Lieque (LU 7) 1
3	2	Shaoze (SI 1) 2, Yanggu (SI 5) 1
1,533	116	

Table 2: Statistics of the 15 most frequently used acupoint combinations in the treatment of VaD.

Number	Acupoint combination	Frequency	Support (%)
1	Baihui (GV 20), Sishencong (EX-HN 1)	98	41.18
2	Baihui (GV 20), Fengchi (GB 20)	81	34.03
3	Baihui (GV 20), Shuigou (GV 26)	72	29.83
4	Baihui (GV 20), Shenting (GV 24)	70	29.41
5	Baihui (GV 20), Zusanli (ST 36)	62	26.05
6	Sishencong (EX-HN 1), Fengchi (GB 20)	60	25.21
7	Baihui (GV 20), Sanyinjiao (SP 6)	57	23.95
8	Baihui (GV 20), Neiguan (PC 6)	54	22.69
9	Sishencong (EX-HN 1), Shuigou (GV 26)	51	21.43
10	Sishencong (EX-HN 1), Baihui (GV 20), Fengchi (GB 20)	51	21.43
11	Baihui (GV 20), Shenmen (HT 7)	51	21.43
12	Sishencong (EX-HN 1), Shenting (GV 24)	49	20.59
13	Sishencong (EX-HN 1), Neiguan (PC 6)	46	19.33
14	Baihui (GV 20), Taixi (KI 3)	46	19.33
15	Sishencong (EX-HN 1), Baihui (GV 20), Shuigou (GV 26)	43	18.07

Support refers to the percentage of acupoint prescriptions containing the acupoint combination.

GRAZIE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