innervated digits. ROIs were defined from contralesional S1 activation and ipsilesional S1 and M1 deactivation clusters. GMV was estimated using VBM (DARTEL, SPM8). Clinical evaluation included NCV for digits 2 and 3 and symptom/functional scales from the Boston CTS Questionnaire.

Results: All acupuncture interventions significantly improved subjective outcomes. No differences were noted between local and distal acupuncture, which were then combined into a single "verum" group. Verum acupuncture improved nerve conduction velocity more significantly than sham (p<0.04). At baseline, ipsilesional M1 GMV was greater in CTS compared to HC (p<0.03), while trending GMV reduction was noted in contralesional S1 (p<0.07), consistent with our previous studies. Verum acupuncture reduced ipsilesional M1 volume compared to sham (p<0.03). Moreover, after verum and not sham acupuncture, the change in ipsilesional M1 volume was correlated with change in nerve conduction velocity (r=-0.39, p<0.02). No significant differences were noted for ipsilesional S1, while no correlations were noted with subjective outcomes.

Conclusion: Verum acupuncture improves both symptoms and peripheral nerve conduction in CTS. Acupuncture also improves structural brain plasticity, and improvements in GMV are more closely associated with objective measures of median nerve function.

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OS13.04

Effects of Electroacupuncture on Endothelial Function and Circulating Endothelial Progenitor Cells in Patients with Cerebral Infarction

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Purpose: The purpose of this study was to evaluate the acute effects of EA on endothelial function and EPCs and the relationship between these variables in patients with chronic ischemic stroke.

Methods: In a randomized, placebo-controlled, crossover study, 20 patients with cerebral infarction were randomized into two treatment groups: EA or placebo. Pulse amplitude tonometry (PAT) for endothelial function and the number of EPCs from peripheral blood were determined before and after each intervention. Circulating EPCs were quantified by flow cytometry as CD45lowCD34+KDR2+ cells. Plasma vascular endothelial growth factor (VEGF) and interleukin (IL)-10 levels were measured. Seven days later, crossover was performed on each group, with each group receiving the other treatment with the same protocol.

Results: The PAT hyperemia ratio ranged from 1.57±0.41 to 2.04±0.51 after EA, representing a significant improvement (p=0.002), however, there was no improvement in the placebo group (p=0.48). Circulating EPCs as measured by flow cytometry increased to 110.6 ± 74.3/100ul in the EA group (p=0.001), but did not differ in the placebo group (45.9 ± 35.3/100ul, p=0.08). The increases in the number of EPCs and the PAT ratio after treatment were correlated (r=0.78, p<0.001). Plasma VEGF levels increased with EA compared to baseline (261.2±34.0 vs. 334.9±80.5 pg/mL, p=0.003). The number of circulating EPCs positively correlated with plasma levels of VEGF (r=0.50, p=0.02).

Conclusion: In conclusion, EA improves efficacy of EPC levels and PAT ratio in patients with cerebral infarction. This study was supported by the Traditional Korean Medicine R&D program funded by the Ministry of Health and Welfare through the Korean Health Industry Development Institute (KHIDI) (No.HI13C0580)

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Male hypogonadism: exploring the role of heavy metal toxicity using mRNA analysis pre and post Cupping Therapy treatment

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Purpose: Male hypogonadism is a prevalent condition that can have huge consequences on quality of life. Traditionally male hypogonadism is defined by a deficiency in testosterone levels which can lead to infertility, muscle wasting, and absence of secondary sexual characteristics. Heavy metals are known to have detrimental effects on the body. Heavy metals such as cadmium, chromium, arsenic, and lead have also been associated with male infertility. Cupping Therapy is a traditional medical treatment recommended in Korean, Chinese and Middle-eastern medical practices in the treatment of male infertility. To date there are no studies that have investigated the effects of Cupping Therapy on serum testosterone levels and heavy metal concentrations in patients with male infertility.

Methods: Eleven men attending infertility clinic and participated in a case-control study. The current study assessed the associations between serum testosterone levels, heavy metal concentrations and response to cupping therapy. Three sessions of cupping therapy were administered to all patients, two weeks apart. Control group received conventional testosterone replacement therapy. Measurements were taken at baseline (pre-intervention) and after the third session. Hormonal parameters and the concentration of frequent heavy metals (lead, cadmium, mercury, copper, zinc and magnesium) from cupped blood and venous blood samples were taken.

Results: There were no significant differences between cases and controls in the concentrations of hormone levels or heavy metals concentration at baseline. Analysis revealed a moderate association between serum hormone levels and heavy metal concentrations. However there was a significant correlation between testosterone levels and cupping therapy intervention.
Conclusion: The effect of heavy metals on testosterone levels in male patients with infertility remains unclear. There is however suggestive evidence that cupping therapy can have a positive impact on testosterone levels in male infertility. Further trials with larger population sample sizes utilising a randomisation methodology is recommended.

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OS14.02

Comparison between Infrared Thermographic Scrotal Temperature Index and Semen Quality among Men attending an Infertility Clinic

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Purpose: It has been suggested that scrotal temperature and semen quality are closely associated. The purpose of this study is to explore the associations of the scrotal temperature measured by the infrared thermography and semen quality among infertility clinic outpatients.

Methods: We performed a retrospective chart review of outpatients who visited at Conmual Hospital, Seoul, Republic of Korea from March 2013 to February 2015. In this study, 48 outpatients who had taken scrotal thermography and semen analysis with a difference of less than a month were included. Semen analysis was done according to 2010 World Health Organization (WHO) guidelines. Abnormal semen parameter was defined as oligozoospermia (O), asthenozoospermia (A) and teratozoospermia (T) according to 2010 WHO guidelines. Scrotal temperature index (STI) was defined as mean left and right skin temperature difference (AT) between the thigh and testicle. We divided patients into two groups as High STI group (n=26) and Low STI group (n=22) by mean STI (1.17) of 48 outpatients. Chi-square test was used to analyze the incidence of at least two abnormal semen parameters between two groups.

Results: There were 10 patients (OT=1, AT=7, OAT=2) and 2 patients (AT=1, OT=1) with at least two abnormal semen parameters in High STI group (n=26) and Low STI group (n=22), respectively. High STI group was associated with increased incidences for at least two abnormal semen parameters than Low STI group (OR= 6.25; 95% CI 1.195-32.687, p=0.019).

Conclusion: In the hypothesis testing using chi-square method, there was a significant difference of incidence of at least two abnormal semen parameters according to STI. We suggest that the infrared thermography may provide the semen quality information. Further studies with large samples are needed.

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OS14.03

Trends in Tongue Color of Subtype patterns on Deficiency Syndrome

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Purpose: Traditional East Asian Medicine posits that the tongue color (TC) in patients with the deficiency syndrome (DS) differ according to its subtype patterns. The DS is categorized into four subtype patterns (FSPs) based on the qi, blood, yin and yang; and it provides helpful information for treatment of DS in clinic. However, a clinical evidence of TC difference according to the FSP has not appeared in paper. In this study, we measured the TC with an objective method and analyzed its differences according to the FSPs on DS.

Methods: One-hundred and twenty-three subjects with DS were participated in the experiment and classified into qi deficiency (n=32), blood deficiency (n=31), yin deficiency (n=30) and yang deficiency (n=30) groups based on the agreements of diagnostic results between two Korean oriental medicine doctors. Tongue images were acquired by using a TAS-4000 instrument, and a color correction was performed based on 12 color samples of the color checker. Median values (MV) of the tongue region in Commission Internationale de l’Eclairage (CIE) L*a*b* color space, which represents the color of a tongue body, were computed for the tongue color features. Red blood cell count (RBCC) was measured from the blood sample. Different trends of TCs according to the FSP were analyzed using multiway ANOVA with factors age and sex.

Results: MV of CIE L* showed difference according to the FSPs (p<0.01). MVs of CIE L* of blood deficiency group were significantly higher than those of other three groups. Pearson’s partial correlation coefficient between RBCCs and MV of CIE b* with age and sex was -0.303.

Conclusion: The TC in the blood deficiency was tended to be brighter than those in other FSPs on DS. The TC seems to be related with RBCC, but the trend of color difference in the blood deficiency differs from that according to RBCC.

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