A preliminary immunopharmacological study of an antiendometriotic herbal medicine, Keishi-bukuryo-gan (Gui Zhi Fu Ling Wan).

Changes in the specific antiendometrial IgM antibodies in an endometriotic patient, who were treated with leuproride acetate and in turn with Keishi-bukuyogan, were investigated by the flowcytometric analysis which was developed in our laboratory. The oriental therapy decreased the specific IgM antibody titer gradually and kept the patient symptom-free for more than 7 months without any suppression of serum CA125 and estradiol levels. On the other hand, leuproride acetate therapy suppressed both serum CA125 and serum estradiol levels but not the IgM antibody titer. The results suggest that the specific antiendometrial IgM autoantibody could be a pathogenic molecule in endometriosis and it could also serve as a clinical marker for the oriental therapy of endometriosis.

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Acupuncture for chronic prostatitis/chronic pelvic pain syndrome (CPPS)

Chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) is prevalent in urological practice and has a significant impact on quality of life. Standard therapies often fail to achieve sustainable amelioration of symptoms. This article attempts to show that neuromodulatory treatment in the form of electroacupuncture can be a minimally invasive and effective treatment for CP/CPPS that is refractory to standard therapies. This neuromodulatory therapy lends support to the hypothesis that the end stage of CP/CPPS may be a neuropathic pain syndrome.

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Chinese Herbal Medicine for Primary Dysmenorrhea
Zhu X, Proctor M, Bensoussan A, Wu E, Smith C.

BACKGROUND: Conventional treatment for primary dysmenorrhoea has a failure rate of 20% to 25% and may be contraindicated or not tolerated by some women. Chinese herbal medicine may be a suitable alternative. OBJECTIVES: To determine the efficacy and safety of Chinese herbal medicine for primary dysmenorrhoea when compared with placebo, no treatment, and other treatment. SEARCH STRATEGY: The Cochrane Menstrual Disorders and Subfertility Group Trials Register (to 2006), MEDLINE (1950 to January 2007), EMBASE (1980 to January 2007), CINAHL (1982 to January 2007), AMED (1985 to January 2007), CENTRAL (The Cochrane Library issue 4, 2006), China National Knowledge
Infrastructure (CNKI, 1990 to January 2007), Traditional Chinese Medicine Database System (TCMDS, 1990 to December 2006), and the Chinese BioMedicine Database (CBM, 1990 to December 2006) were searched. Citation lists of included trials were also reviewed. SELECTION CRITERIA: Any randomised controlled trials involving Chinese herbal medicine versus placebo, no treatment, conventional therapy, heat compression, another type of Chinese herbal medicine, acupuncture or massage. Exclusion criteria were identifiable pelvic pathology and dysmenorrhoea resulting from the use of an intra-uterine contraceptive device. DATA COLLECTION AND ANALYSIS: Quality assessment, data extraction and data translation were performed independently by two review authors. Attempts were made to contact study authors for additional information and data. Data were combined for meta-analysis using either Peto odds ratios or relative risk (RR) for dichotomous data or weighted mean difference for continuous data. A fixed-effect statistical model was used, where suitable. If data were not suitable for meta-analysis, any available data from the trial were extracted and presented as descriptive data. MAIN RESULTS: Thirty-nine randomised controlled trials involving a total of 3475 women were included in the review. A number of the trials were of small sample size and poor methodological quality. Results for Chinese herbal medicine compared to placebo were unclear as data could not be combined (3 RCTs). Chinese herbal medicine resulted in significant improvements in pain relief (14 RCTs; RR 1.99, 95% CI 1.52 to 2.60), overall symptoms (6 RCTs; RR 2.17, 95% CI 1.73 to 2.73) and use of additional medication (2 RCTs; RR 1.58, 95% CI 1.30 to 1.93) when compared to use of pharmaceutical drugs. Self-designed Chinese herbal formulae resulted in significant improvements in pain relief (18 RCTs; RR 2.06, 95% CI 1.80 to 2.36), overall symptoms (14 RCTs; RR 1.99, 95% CI 1.65 to 2.40) and use of additional medication (5 RCTs; RR 1.58, 95% CI 1.34 to 1.87) after up to three months of follow-up when compared to commonly used Chinese herbal health products. Chinese herbal medicine also resulted in better pain relief than acupuncture (2 RCTs; RR 1.75, 95% CI 1.09 to 2.82) and heat compression (1 RCT; RR 2.08, 95% CI 2.06 to 499.18). AUTHORS' CONCLUSIONS: The review found promising evidence supporting the use of Chinese herbal medicine for primary dysmenorrhoea; however, results are limited by the poor methodological quality of the included trials.


**Chinese Herbs increase ATP production and antioxidants**

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Enhancement of ATP generation capacity, antioxidant activity and immunomodulatory activities by Chinese Yang and Yin tonifying herbs
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Abstract
Chinese tonifying herbs such as Herba Cistanche, Ganoderma and Cordyceps, which possess antioxidant and/or immunomodulatory activities, can be useful in the prevention and treatment of age-related diseases. Pharmacological studies on Yang and Yin tonifying herbs suggest that Yang tonifying herbs stimulate mitochondrial adenosine triphosphate (ATP) generation, presumably through the intermediacy of reactive oxidant species, leading to the enhancement of cellular/mitochondrial antioxidant status. Yin tonifying herbs, however, apart from possessing antioxidant properties, exert mainly immunomodulatory functions that may boost a weak immune system and may also suppress overreactive immune responses. The abilities of Yang and Yin Chinese tonifying herbs to enhance ATP generation and to exhibit antioxidant and/or immunomodulatory actions are the pharmacological basis for their beneficial effects on the retardation of aging.

Background
Aging is a process of bodily change with time, leading to increased susceptibility to disease, and ultimately death. Because reactive oxidant species (ROS) and immune dysfunction are major causes of age-related diseases [1-3], the maintenance of antioxidant and immune fitness is a rational approach to preventive health care. Accumulation of ROS-induced oxidative damage to DNA, proteins, and other macromolecules has been regarded as a major endogenous cause of aging [1]. In addition to ROS-mediated cellular damage, aging was found to be associated with immune senescence, attributable at least partly to the loss of T lymphocyte functions [2,3]. Such loss increases the prevalence of infectious diseases in the elderly. With advances in modern medical research techniques, research on age-related chronic illnesses has become intense, in the quest for valuable preventive and therapeutic measures. Humans have been making continuous efforts to fight aging. As Chinese medicine has always emphasized the prolongation of a healthy lifespan, many Chinese tonifying herbs have long been used to safeguard health and to delay the onset of senility.

Under both normal and pathological conditions, ROS are generated in all cells undergoing aerobic metabolism, particularly from mitochondria. The cell possesses two distinct antioxidant defense systems to counteract damaging ROS: (1) enzymatic antioxidants such as catalase, superoxide dismutase (SOD), glutathione peroxidase and other related enzymes/molecules, and (2) non-enzymatic antioxidants such as ascorbic acid (vitamin C), α-tocopherol (vitamin E) and β-carotene. To achieve optimal antioxidant fitness, every component of the antioxidant defense system should function optimally because antioxidants
must work together in a synergistic manner. Chinese tonifying herbs have been shown to possess both in vitro and in vivo antioxidant activities [4,5].

The immune system fights against 'foreign invaders' such as bacteria, viruses, fungi, yeasts and parasites. The humoral and cell-mediated immune responses show great competence in dealing with intruders. Moreover, the surveillance function of the immune system tends to prevent cancers, particularly in old age. However, an overreactive or imbalanced immune system can cause allergies or autoimmune disorders. A well-constituted and balanced immune system is thus crucial for safeguarding health. Chinese tonifying herbs have been shown to stimulate or suppress the cell-mediated immune response both in vitro and in vivo [6].

The importance of disease prevention has been recognized by Chinese medicine through experience accumulated over centuries. Many Chinese tonifying herbs have long been used for safeguarding health and for delaying the onset of senility. According to Chinese medicine theories, tonifying herbs prescribed for various symptoms of ill-health are generally classified into four categories on the basis of their health-promoting actions, namely 'Yang-invigorating', the 'Qi-invigorating', the 'Yin-nourishing' and the 'Blood-enriching' herbs [7]. The 'Qi-invigorating' and 'Blood-enriching' herbs are of Yang and Yin characteristics respectively. Chinese medicine theories suggest that a balance of Yin and Yang is essential to sustain optimal body function [8]. From a modern medical perspective, the maintenance of Yin and Yang in harmony may be described as the attainment of bodily homeostasis. The long-known antagonistic relationship between parasympathetic and sympathetic neural activities affords an example of both a phenomenon well-recognized by Western medicine and the Yin/Yang balance. A recent psychophysiological investigation in humans revealed an association between decreased parasympathetic or sympathetic activities with deficiencies of Yin or Yang respectively [9].

The theoretical framework of Chinese medicine is based on the Chinese cultural fabrics and clinical experience, while modern Western medicine has been established on the basis of laboratory and clinical investigations [10]. As the two distinct medical systems are complementary, bridging of the knowledge gap between Chinese and Western medicine is essential for their integration, in clinical practice, for disease prevention and treatment. Expounding Chinese medicinal theories in modern scientific terms to a Western audience facilitates communication between practitioners of the two systems.

In our earlier studies, we found that tonifying herbs with Yang or Yin properties were associated with antioxidant and immunostimulatory activities respectively [4]. Recent studies indicated that only Yang tonifying herbs (not Yin tonifying herbs) enhanced mitochondrial ATP generation capacity in mouse hearts [11]. We therefore suggest that Yang tonifying herbs enhance mitochondrial ATP generation, while Yin tonifying herbs are associated with immunomodulatory
activities. In this mini-review, we summarize the abilities of Yang and Yin tonifying herbs to enhance ATP generation capacity, and to potentiate antioxidant and/or immunomodulatory actions, in an effort to characterize their respective pharmacological properties.

Enhancement of ATP generation by Yang tonifying herbs

In Chinese medicinal theories, Yang is a manifestation of body functions supported by various organs. A 'Yang-invigorating' action therefore involves the enhancement of bodily functions in general and cellular activities that consume ATP in particular. The mitochondrion is responsible for the generation of ATP through oxidative metabolism. To establish the pharmacological basis of ‘Yang-invigorating’ action, we have recently investigated the effect of Yang herbs on ATP generation capacity in heart homogenates prepared from mice that were pretreated with methanolic extracts of herbs [11]. Tonifying herbs from other functional categories were examined for comparison. While Chinese herbs are usually extracted by water for human oral consumption, water was replaced by methanol in our study for convenience in the processing and storage of samples. Yang herbs invariably enhanced myocardial ATP generation, with stimulation ranging from 20–130%. Herba Cynomorii and Semen Cuscutae were the most potent herbs examined. By contrast, none of the Yin herbs enhanced ATP generation; some Yin herbs even suppressed ATP generation slightly (Table 1). A preliminary mechanistic study indicated that Yang herbs may speed up ATP synthesis by increasing mitochondrial electron transport [11].

Effect of Yang and Yin tonifying herbs on myocardial ATP generation capacity in mice ex vivo

Correlation between enhancement of ATP generation capacity and antioxidative capacity

Mitochondrial oxidative phosphorylation generates ROS as byproducts. Highly reactive chemically, ROS attack cellular structures located near the sites where ROS are generated. Mitochondrial DNA, proteins, and lipids in the inner membrane of mitochondria are thus vulnerable to oxidative damage [12], resulting in generalized organelle dysfunction, defective mitochondrial biosynthesis and poor energy metabolism [13].

Under normal physiological conditions, the mitochondrial antioxidant defense system adequately handles the potentially detrimental effects of ROS derived from energy metabolism [14]. When a functional imbalance between ROS levels and antioxidant concentrations caused by various disease states and/or aging occurs, age-related disorders such as cancer, cardiovascular diseases, brain dysfunction, or cataract may occur [15]. Antioxidant supplementation, particularly from herbal extracts, has become a trend in preventive health care.

Using an oxygen radical absorbance capacity assay, Ou et al. recently compared the free radical scavenging (i.e. antioxidant) activities of Yang and Yin herbs [16]. The results indicated that Yin herbs generally possessed higher antioxidant activities than Yang herbs and that the antioxidant potencies correlated well with the amounts of total phenolic compounds in the herbs. The authors suggested an
analogy between Yin/Yang balance and antioxidation/oxidation in energy metabolism. These findings of higher antioxidant activities in Yin herbs as compared with those in Yang herbs do not agree with the findings from one of our earlier studies which showed that most of the Yang herbs possessed a more potent 1,1-diphenylpicrylhydrazyl radical-scavenging action than other tonifying herbs [4] (Table 2). Although the use of different herbal extraction methods and distinct antioxidant assays precludes direct comparison of the two studies, the discrepancy might be due to the selection of almost completely different sets of Yin and Yang herbs for testing in the two studies. Our study focused on herbs used for safeguarding health (i.e. herbs used for tonifying purposes) (Tables 2, Table 3 of reference [17]). Ou et al. probably used a selection criterion based on the general Yin and Yang properties of the herbs instead of their Yin-tonifying and Yang-tonifying actions [16]. Szeto and Benzie, using the same set of herbs described in Ou et al. to examine possible protective effects on DNA oxidative damage, found that the Yang herbs showed an antioxidant effect superior to that of Yin herbs [5].

Antioxidant activities of Yang tonifying herbs
Several Yang herbs have been shown to possess antioxidant activities both in vitro and in vivo (Table 4). In vitro free radical-scavenging activities were detected in herbal extracts prepared from Herba Epimedii [4,18], Radix Dipsaci [4,16], Fructus Psoraleae [4], Semen Cuscutae [16], Herba Cistanche [4,16,18], Cortex Eucommiae [19] and Rhizoma Cibotii [4,16]. Aqueous extracts of Rhizoma Drynariae and Cortex Eucommiae were found to inhibit oxidant production from rat osteoblasts [20], and also inhibited biomolecular oxidative damage [21]. Active ingredients (bakuchiol, isobavachin and isobavachalcone) from Fructus Psoraleae inhibited the NADPH-dependent peroxidation of rat microsomal and mitochondrial lipids in vitro [22]. An ethanolic extract of Radix Dipsaci enhanced the antioxidant status of blood and liver in rodents [23] and a Radix Morindae extract increased blood antioxidant enzyme activities in diabetic rats [24]. Phenylethanoids isolated from Herba Cistanche were found to prevent cell damage induced by in vitro and in vivo exposure to carbon tetrachloride in rats [25]. A recent study from our laboratory indicated that pretreatment with the methanolic extract of Herba Cistanche protected against ischemia-reperfusion injury in rat hearts ex vivo and enhanced mitochondrial ATP generation in the rat hearts ex vivo and H9c2 cells in situ. The ATP-stimulating action was possibly due to enhanced oxidative phosphorylation caused by increases in the activities of complexes I and III [26]. As good body function requires a large amount of energy and antioxidant defense is essential in sustaining mitochondrial ATP production [27], the antioxidant activities of Yang herbs may safeguard ATP generation, particularly under conditions of upregulated cellular activities.

Antioxidant activities of Yin tonifying herbs
Methanolic extracts of both Fructus Ligustri and Herba Ecliptae were found to enhance hepatic glutathione (GSH) regeneration capacity in rats [4,28]. The enhancement of hepatic GSH regeneration capacity by Fructus Ligustri was
associated with a hepatoprotective action against carbon tetrachloride toxicity [28]. Activity-directed fractionation of Fructus Ligustri indicated that the hepatoprotective principle(s) resided mainly in the oleanolic acid-enriched butanol and chloroform fractions [28]. Moreover, our recent studies showed that both short and long term pretreatment with oleanolic acid protected against myocardial ischemia-reperfusion injury in rats [29,30]. It was suggested that the cardioprotection afforded by oleanolic acid pretreatment was related to the enhancement of mitochondrial antioxidant mechanism mediated by GSH and \( \alpha \)-tocopherol [29]. Both experimental and clinical investigations indicated that the antioxidant status influenced immunocompetence, particularly under conditions of stress such as physical exercises or chronic diseases [31]. The antioxidant activities of Yin tonifying herbs may positively influence immunostimulatory activities.

Experimental studies on a 'Yang-invigorating' herbal formula

A 'Yang-invigorating' herbal formula named VI-28 has been shown to produce 'Yang-invigorating' effects [32] and enhance red cell antioxidant status, particularly Cu-Zn-superoxide dismutase (SOD) activity, in elderly male human subjects [33]. This herbal formula is comprised of Radix Ginseng, Cornu Cervi, Cordyceps, Semen Allii, Fructus Cnidii, Fructus Evodiae and Rhizoma Laemferiae. Recently we investigated the effects of long-term VI-28 treatment on red cell Cu-Zn-SOD activity, mitochondrial functional ability, and antioxidant levels, in various tissues of rats of both sexes [34]. The results indicated that VI-28 treatment increased red cell Cu-Zn-SOD activity and mitochondrial ATP generation capacity, increased the levels of reduced GSH and \( \alpha \)-tocopherol, and reduced Mn-SOD activities. The enhancement of ATP generation by VI-28 increased mitochondrial ROS production, resulting in the upregulation of mitochondrial antioxidant mechanism. The VI-28-induced increase in mitochondrial antioxidant capacity in various tissues was evidenced by a significant reduction in ROS generation. Given that cellular energy status and mitochondrial ROS generation are factors critically involved in aging, the dual effect of 'Yang-invigoration' produced by VI-28 may have clinical implications in the prevention of age-related diseases.

Immunomodulatory activities of Yin tonifying herbs

It was suggested that the proper functioning of the immune system requires dynamic interactions between Yang and Yin. And while the antigen-nonspecific immune response is associated with Yang, the antigen-specific response is related to Yin [35]. One of our earlier studies investigated antioxidant and immunomodulatory activities in different categories of tonifying herbs. The results showed that 6 and 7 of a total of 8 Yin herbs tested potentiated concanavalin A (Con A)-stimulated splenocyte proliferation (an antigen-specific response) in mice in vitro and ex vivo respectively. By contrast, only 3 of 9 Yang herbs tested showed a similar enhancement of the Con A-stimulated immune response [4] (Table 2).

Among the Yin herbs, the methanolic extract of Fructus Ligustri yielded the most robust immunostimulatory action in mouse splenocytes [4]. Differential extraction
of Fructus Ligustri by solvents of increasing polarity indicated that the immunostimulatory activity resided mainly in the petroleum ether fraction [36]. Oleanolic acid, an immunomodulatory triterpenoid commonly found in herbs including Fructus ligustri [37,38], was undetectable in this fraction [36]. Currently, activity-directed fractionation of the petroleum ether extract of Fructus Ligustri is under way in our laboratory. Various immunomodulatory actions of Yin tonifying herbs, and the active ingredients of the herbs, have been reported in other studies (Table 5). An aqueous extract of Radix Asparagi was found to inhibit tissue necrosis factor-α (TNF-α) secretion by suppressing Interleukin (IL)-2 secretion from astrocytes, implicating that the extract might exhibit anti-inflammatory activity in the central nervous system [39]. Both the crude aqueous extract and the two active ingredients (ruscogenin and ophiopogonin D) of Radix Ophiopogonis produced anti-inflammatory effects in rodents [40]. While the aqueous extract inhibited xylene-induced ear swelling and carrageenan-induced paw edema in mice, it also suppressed carrageenan-induced pleural leukocyte migration in rats, and the zymosan-evoked migration of peritoneal total leukocytes and neutrophils in mice. Treatments with ruscogenin and ophiopogonin D decreased zymosan-induced peritoneal leukocyte migration in mice and reduced the phorbol-12-myristate-13 acetate-induced adhesion of HL60 cells to ECV304 cells [40]. Several sesquiterpenes isolated from Herba Dendrobii were found to exhibit immunomodulatory activity by exerting comitogenic effects on Con A and lipopolysaccharide-stimulated mouse splenocytes [41,42]. It has recently been reported that an ethanolic extract of black rice (the fruit of Oryza sativa) showed anti-asthmatic effects in a mouse model [43]. Treatment with the ethanolic extract of black rice reduced the number of eosinophils in bronchoalveolar lavage fluid, alleviated the airway hyper-response, and decreased the extent of airway inflammation in ovalbumin (OVA)-immunized and -aerolized mice challenged with OVA. Moreover, the ethanolic extract treatment decreased interferon-γ (INF-γ), IL-4, IL-5 and IL-13 levels in the supernatants of cultured splenocytes and suppressed the plasma levels of OVA-specific immunoglobulin (Ig)G, IgG2α, IgG1 and total IgE in OVA-immunized and -challenged mice [43]. Clinical investigations indicated that intramuscular injection of undiluted Fructus Ligustri extract at a dose of 2–4 ml once or twice daily could prevent leucopenia caused by chemotherapy or radiotherapy. Fructus Ligustri treatment normalized white blood cell counts, thereby increasing tolerance to chemo/radiotherapy [44]. Oral administration of Fructus Ligustri tablets at a daily dose of 50 g equivalence of crude herb was found to ameliorate the symptoms of chronic bronchitis [44]. A herbal formula comprising Fructus Ligustri, Radix Scutellariae, Radix Astragalus and Eupolyphaga et polyphae was found to alleviate symptoms and improve immune function in HIV/AIDS patients [45].

Immunomodulatory activities of Yin tonifying herbs

Ganoderma – A ‘Fu Zheng’ tonifying herb

Ganoderma, another Yin tonifying herb with immunomodulatory effects, is widely consumed by the Chinese people who believe that it promotes health and longevity, lowers the risk of cancer and heart diseases and boosts the immune
system [46]. In Chinese medicine, Ganoderma is regarded as a very potent herb for 'Fu Zheng', a Chinese medicine concept comparable to immunotherapy/immunomodulation in Western medicine. While Ganoderma is traditionally used to increase the resistance of the body immune system to pathogens and to restore normal body functions, the herb has now also been used to decrease the side effects of Western medical procedures, such as surgery, radiotherapy and chemotherapy which often weaken the immune system. The anti-cancer/immunomodulatory effects of Ganoderma were associated with triterpenes [47], polysaccharides [48,49] or immunomodulatory proteins [50] through mechanisms involving inhibition of DNA polymerase [51], inhibition of post-translational modification of the Ras oncoprotein [52] or the stimulation of cytokine production [53]. Recent studies on the immunomodulatory activities of Ganoderma indicated that Ganoderma extract stimulated the proliferation of human peripheral blood mononuclear cells and raised the levels of mRNAs encoding Th1 and Th2 cytokines in these cells [54]. Moreover, polysaccharides of Ganoderma activated mouse splenic B cells and induced these cells to differentiate into IgM-secreting plasma cells. This process was dependent on the polysaccharide-mediated induction of Blimp-1, a master regulator capable of triggering a cascade of gene expression during plasmacytic differentiation [55]. In human peripheral B lymphocytes, the Ganoderma polysaccharide fraction enhanced antibody secretion and induced the production of Blimp-1 mRNA, though it failed to induce lymphocyte differentiation [55].

In addition to immunomodulating activities, Ganoderma possesses in vivo antioxidant potential, another aspect of Yin tonifying action. Treatment with Ganoderma extract was found to enhance the hydroxyl radical scavenging activity of rabbit blood plasma [56,57]. Ganoderma acted by stimulating cellular and mitochondrial SOD activities, thereby enhancing the antioxidant capacity of the body [58]. It was shown that an intraperitoneal injection of Ganoderma extract following a lethal dose of cobalt X-ray radiation caused a marked prolongation of survival time in mice [59]. Pretreatment with Ganoderma extract also markedly protected against carbon tetrachloride-induced hepatic damage and the associated impairment in hepatic antioxidant status [60].

Cordyceps – A Yin/Yang tonifying herb

Cordyceps, a premium Chinese tonifying herb which replenishes the 'kidney' and soothes the 'lung', is prescribed for the treatment of a host of disorders, including hyposexualities, hyperglycemia, hyperlipidemia, asthenia after illness, respiratory diseases, renal disorders, liver and heart diseases [61]. Cordyceps is regarded as a tonifying herb with both 'Yin-nourishing' and 'Yang-invigorating' actions. Pharmacological studies have shown that Cordyceps possesses a wide spectrum of biological activities including antioxidation [61-64], immunopotentiation [65-68], anti-tumorigenesis [68-71], anti-inflammation [72] and stimulation of testosterone biosynthesis [73]. We have recently investigated the effects of wild and cultured Cordyceps on Con A-stimulated splenocytes (an in vitro bioassay for Yin tonifying action) and myocardial ATP generation capacity (an ex vivo bioassay for Yang tonifying action) [74]. The results indicated that
methanolic extracts of wild and cultured Cordyceps enhanced both the Con A-stimulated splenocyte proliferation in vitro and myocardial mitochondrial ATP generation ex vivo in mice, with no significant difference in potencies when the two types of Cordyceps were compared. While the immunopotentiating effect was associated with an increase in IL2 production, the stimulation of myocardial ATP generation was paralleled by an enhancement in mitochondrial electron transport. When compared with typical Yin and Yang tonifying herbs (Fructus Ligustri and Herba Cynomorii respectively), Cordyceps was found to possess both Yin and Yang tonifying actions, with a lower potency in both modes of action. The observation of both immunopotentiating and ATP-enhancing activities in Cordyceps extracts further supports the pharmacological basis of Yin and Yang tonifying herbs in Chinese medicine.

Conclusion

Yang tonifying herbs stimulate mitochondrial ATP generation, leading to the enhancement of cellular/mitochondrial antioxidant status, presumably through the intermediacy of ROS. Yin tonifying herbs, which also possess antioxidant properties, are mainly immunomodulatory, thereby boosting weak immune functions and suppressing overreactive or unbalanced immune responses. Cordyceps, highly regarded as a tonifying herb with a dual action of Yin and Yang, stimulates mitochondrial ATP generation and enhances cellular immune responses. Given that impairment in mitochondrial functional ability and antioxidant status, and a decline in immunocompetence, are believed to be critically involved in the development of age-related diseases and the aging process, the abilities of Yang and Yin tonifying herbs to enhance ATP generation capacity and to produce antioxidant and immunomodulatory actions are beneficial for safeguarding health and delaying the onset of senility (Figure 1). While animal models may be used for testing working hypotheses on Yang and Yin tonifying actions, clinical studies, using Yang and Yin tonifying herbs and/or defined chemicals isolated from the herbs or synthesized in the laboratory, on age-related variations in antioxidant and immune function, would be of considerable value.

Clinical studies on the mechanism for acupuncture stimulation of ovulation

Ovulatory dysfunction is commonly seen in gynecology clinic. It may cause infertility, anemia, functional uterine bleeding and a variety of complications. This research according to TCM theory records treating with acupuncture 34 patients suffering from ovulatory dysfunction. Changes in clinical symptoms and some relative targets are reported, plus findings in animal experiments. The theory concerning the generative and physiologic axis of women, this research involved the following points: Ganshu (UB 18), Shenshu (UB 23), Guanyuan (Ren 4), Zhongji (Ren 3), and Sanyinjiao (Sp 6). The reinforcement and reduction of acupuncture enables it to strengthen liver and kidney. Through the Chong and Ren channels it nourishes uterus to adjust the patient's axis function and recover ovulation. Treated on an average of 30 times, the patients' symptoms improved to varying degrees. The marked effective rate was 35.29%, the total effective rate
being 82.35%. BBT, VS, CMS, and B ultrasonic picture all improved to some degree. The results also showed that acupuncture may adjust FSH, LH, and E2 in two directions and raise the progesterone level, bringing them to normal. The animal experiments confirmed this result. Results showed that acupuncture may adjust endocrine function of the generative and physiologic axis of women, thus stimulating ovulation. The results of this research will provide some scientific basis for treating and further studying this disorder.

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**Acupuncture on the day of embryo transfer significantly improves the reproductive outcome in infertile women: a prospective, randomized trial**

Vienna, Austria: There was heartening news today (Wednesday 3 July) for would-be parents worried because they had difficulty conceiving. A new study being presented to Europe's leading reproductive medicine conference shows that most healthy couples concerned because the woman was not pregnant after a year of trying will conceive during the second year.

A US team from the National Institute of Environmental Health Sciences in North Carolina who analysed data on 782 couples from seven European cities1, concluded that even when the woman was aged between 35 and 39, fewer than 1 in 10 failed to conceive after 2 years unless the male partner was over 40.

Lead investigator Dr David Dunson suggested that couples should be patient and doctors should not intervene too fast with assisted reproductive techniques unless there are known reasons for a couple not conceiving naturally within a year.

He told the annual conference of the European Society of Human Reproduction and Embryology that recent research undertaken by his team showed that fertility in women started to decline as early as the late 20s and for men from their late 30s2. But, this was due primarily to declines in the per menstrual cycle conception rate and not to an increase in the proportion of couples unable to achieve an unassisted pregnancy.

Now his team has extended their research using data from the European Fecundability Study to see what the implications are for fertility rates overall.

"On average the time to pregnancy increases with the age of the woman. The percentage failing to conceive within a year ranged from 8% for 19-26-year-olds to 13 to 14% for 27 to 34-year-olds to 18% for 35-39-year-olds."

"But, regardless of age, most of the women who failed to conceive within the first 12 cycles conceived in the next 12. Only 3% of 19 to 26-year-olds, 6% of 27 to
34-year-olds and 9% of 35 to 39-year-olds failed to conceive in the second year, provided the male partner was aged under 40. Starting in the late 30s though, male age was also important: it meant that the percentage of failures after one year for women aged 35 to 39 rose from 18% to 28% if the male partner was over 40. After the second year the figure was 9% with male partners under 40 and 16% with male partners over 40.

Dr Dunson said there were clear increases with age in the number of menstrual cycles needed to achieve pregnancy and in the probability of being classified as clinically infertile - a definition applied after a year of trying to conceive.

But, their research had clearly shown that among outwardly healthy couples with no known conditions associated with infertility, most who failed to conceive naturally within the first year will conceive naturally in the second year - regardless of age.

"So, in the absence of clinical indicators of infertility in addition to a long time to pregnancy, it may be appropriate to delay assisted reproduction until the couple has failed to conceive naturally in 18 to 24 months. There is a large amount of normal variability in fertility and many couples having below average, but normal fertility may fail to conceive within a year. This is particularly true for older couples, many of whom fail to conceive within the first year but are successful in the second."

He said it was important for doctors to avoid recommending assisted reproduction too soon due to well-documented side effects. "Fertility treatment, such as IVF and ICSI, can result in an increased risk of multiple pregnancies, pregnancy complications, low birth weight, major birth defects and long-term disability among surviving infants. In addition, the chance of success with ART decreases with age, while the side effects increase in prevalence."

National Institute of Environmental Health Sciences

1 Data were drawn from a large multinational study - the European Study of Daily Fecundability. It enrolled 782 women aged between 18 and 40 from seven centres - Milan, Verona, Lugano, Dusseldorf, Paris, London and Brussels. The participants kept daily records of basal body temperature and recorded the days on which intercourse and menstrual bleeding occurred. Data on 7,288 menstrual cycles contributed to the study.


Electro-acupuncture was as efficacious as i.v. alfentanil for pain control during oocyte retrieval for IVF
OBJECTIVE To compare the efficacy of electro-acupuncture (EA) and i.v. alfentanil, both in combination with a paracervical block (PCB), for analgesia during oocyte retrieval for in vitro fertilization (IVF) and to determine if there is any effect on pregnancy rate.

DESIGN Multicentre, randomized, non-blinded, controlled trial. Allocation was blocked and stratified by centre, using sealed envelopes. The study had sufficient power to detect an absolute difference of 17% in pregnancy rate.

SETTING Five IVF centres in Sweden.

SUBJECTS A total of 274 women, aged = 38 (mean 33) years, who were undergoing oocyte retrieval for IVF treatment, with at least 4 large follicles, body mass index = 28 kg/m$^2$, and no more than 3 previous IVF cycles. The main infertility diagnosis was male factor in 40% of cases, tubal factor in 15%, endometriosis in 16%, polycystic ovarian syndrome in 5%, and unexplained in 25%. It was the first IVF attempt for 52% of women. An additional 12 randomized women (4%), a similar proportion in each group, were lost to follow-up or withdrew and were excluded from the analysis.

INTERVENTION Randomization allocated 136 women to receive electro-acupuncture (manual, low-, and high-frequency stimulation at multiple anatomical positions), starting 30 min prior to oocyte retrieval and continuing throughout the procedure, and 138 women to receive alfentanil 0.5 mg and atropine 0.25 mg i.v. just prior to the start of the procedure. All women received a PCB of lidocaine 50 mg just before oocyte retrieval. In both groups, (additional) alfentanil could be administered, if required.

MAIN OUTCOME MEASURES Pain and subjective experience before, during, and after oocyte retrieval (visual analogue scale, 0-100), use of additional analgesics, pregnancy.

MAIN RESULTS Prior to the oocyte retrieval procedure, there was no difference between groups in the women’s levels of stress, anxiety, or discomfort. Immediately after the procedure, the median (range) pain levels related to oocyte retrieval reported by the women were 46 (1-96) in the EA group and 45 (0-92) in the alfentanil group for maximum pain (NS), and 28 (1-77) and 23 (0-78), respectively, for average pain (NS). Levels of stress, anxiety, and nausea during oocyte retrieval were also similar between the two groups. At 2h after the procedure, women in the EA group reported significantly lower median scores for abdominal pain: 11 (0-70) vs 16 (0-90), (p<0.01). Levels of other pain, nausea, stress, and anxiety were also significantly lower in the EA group. Additional alfentanil was given to 14% of women in the EA group, compared to 38% in the alfentanil group (p<0.0001). There were 43 pregnancies (32% per oocyte retrieval).
retrieval) in the EA group and 49 (36%) in the alfentanil group (p=0.50 * ), with 6 miscarriages in each group.

CONCLUSION Electro-acupuncture was at least as efficacious as i.v. alfentanil for pain control during oocyte retrieval for IVF, requiring less additional analgesics, and resulted in less pain and discomfort after the procedure. The analgesic method had no significant effect on pregnancy rate.

Commentary

The use of complementary and alternative therapies is becoming more common as a replacement or adjuvant to conventional therapies for pain relief and, in the realm of assisted reproductive technologies, the improvement of fertility outcome.[1] The authors of the present study hypothesized that electroacupuncture (EA), in lieu of alfentanil, as an analgesic adjuvant to a paracervical block (PCB) could achieve both of these goals. Although the amount of pain experienced related to the oocyte aspiration procedure was found to be no different when recalled directly after the retrieval, significantly less pain, nausea, and stress were observed in the EA group at 2 h following the retrieval. No correlation with IVF outcomes was observed. The results are not so unexpected. In terms of analgesia, the discordance between intraoperative and postoperative analgesia can be explained by the small, single dose of alfentanil given just prior to the PCB. Such a dose would be expected to provide some degree of intraoperative analgesia (as noted by the reduced response to PCB administration), but with redistribution and terminal elimination phases of 12 and 90 min, respectively, limited, if any, postoperative analgesia would be anticipated. This desire to provide postoperative analgesia is why many centres, including our own, utilize a small amount of fentanyl (50–100 μg), a narcotic with a longer half-life (240 min). This being said, the limited differences in intraoperative pain may rest with the study design; assessments in the postoperative recovery area of intraoperative surgical pain have uniformly demonstrated results which are influenced by the level of anxiety experienced preoperatively, the medications received, the type, duration and outcome of the surgery, and other environmental influences. The results of such studies indicate that retrospective assessment of pain does not appear to correlate well with the degree of discomfort actually experienced.

The results of EA on postoperative analgesia are more provocative. In approximately one-third of the subjects in both groups, neuropeptide Y (NPY) concentrations were measured in the follicular fluid. NPY, a pluripotent peptide released with sympathetic stimulation, was found in significantly higher levels in the EA group. While no correlation between NPY and pregnancy rate was found, the improved analgesic and stress scores observed in the postoperative period in the EA group may have had some relevance to NPY, a peptide known to interrupt the transmission of painful stimuli.[2]
The second aspect of the study, the effect of the two analgesic methods on fertility outcomes, again comes without surprise. Narcotics, including fentanyl, alfentanil, remifentanil, and meperidine, when studied in clinically relevant doses, do not appear to interfere with either fertilization or preimplantation embryo development in animal and human trials.[3] In part, this absence of effect is due to these agents existing in extremely low to nonexistent concentrations in follicular fluid; with alfentanil, a 10:1 ratio between serum and follicular fluid has been observed 15 min following the initial bolus dose.[4]

The authors should be congratulated for evaluating novel therapies in this special population. Further work will be needed to more fully evaluate the implications of NPY and other peptides, as well as the use of complementary and alternative therapies in women undergoing assisted reproductive technologies.

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Literature cited


Fallopian Tube Dysfunction and Chinese Herbal Medicine

A study was carried out in Guangzhou, China, to find an effective treatment for tubal obstruction. The results of 120 women divided into three treatment groups were compared. One group received a combination of Western medical treatment and Chinese herbal medicine, one group received Chinese herbal medicine only and another group received Western medical treatment only. After treatment, the fallopian tube patency rate 86.7% and the pregnancy rate 85.0% in the TCM/WM group, 66.7% and 63.3% in the TCM group and 53.3% and 50% in the WM group respectively. The effectiveness in the combination group was significant. The authors conclude that the combination of western and Chinese medicine is the most effective method in treating tubal obstruction.


L-arginine treatment for in-vitro fertilization in poor responder patients

The objective of the present study was prospectively and randomly to evaluate the role of L-arginine in improving uterine and follicular Doppler flow and in improving ovarian response to gonadotrophin in poor responder women. A total of 34 patients undergoing assisted reproduction was divided in two groups according to different ovarian stimulation protocols: (i) flare-up gonadotrophin-releasing hormone analogue (GnRHa) plus elevated pure follicle stimulating hormone (pFSH) (n = 17), and (ii) flare-up GnRHa plus elevated pFSH plus oral L-arginine (n = 17). During the ovarian stimulation regimen, the patients were submitted to hormonal (oestradiol and growth hormone), ultrasonographic (follicular number and diameter, endometrial thickness) and Doppler (uterine and perifollicular arteries) evaluations. Furthermore, the plasma and follicular fluid concentrations of arginine, citrulline, nitrite/nitrate (NO2-/NO3-), and insulin-like growth factor-1 (IFG-1) were assayed. All 34 patients completed the study. In the L-arginine treated group a lower cancellation rate, an increased number of oocytes collected, and embryos transferred were observed. In the same group, increased plasma and follicular fluid concentrations of arginine, citrulline, NO2-/NO3-, and IFG-1 was observed. Significant Doppler flow improvement was obtained in the L-arginine supplemented group. Three pregnancies were registered in these patients. No pregnancies were observed in the other group. It was concluded that oral L-arginine supplementation in poor responder patients may improve ovarian response, endometrial receptivity and pregnancy rate.

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Measuring the Effectiveness of Chinese Herbal Medicine in Improving Female Fertility

Keywords: Infertility, Chinese herbal medicine, ultrasound, hormone levels.

Aim: To determine the relationship between female fertility indicators and the administration of Chinese herbal medicine (CHM).

Design: A prospective cohort clinical study to measure accepted bio-medical factors that affect female fertility and to determine if CHM can improve these factors as well as pregnancy outcome.

Setting: A private practice specializing in treating infertility with traditional Chinese medicine (TCM). The study took place between November 2003 and December 2004. Patient(s): Fifty women with the Western medical diagnosis of unexplained infertility.

Interventions: One monitored menstrual cycle measuring pre-treatment fertility factors, followed by treatment with Chinese herbal medicine and subsequent measurement of the changes in the same fertility factors.

Results: Significant differences were observed between the two time points for the majority of factors measured. Pregnancies in the sample group recorded 6 months after commencement of the last treatment were 28, with 11 live births and 7 miscarriages.

Conclusion: The study outcome demonstrates that using Chinese herbal medicine results in higher success rates of pregnancy, with no patient side-effects and a reduction in the category of patients conventionally classified as having unexplained infertility.

Introduction

The research question this study seeks to answer is “Does administering Chinese herbal medicine (CHM) improve the physiological factors affecting human female fertility?” The hypothesis is that administering CHM improves the main physiological factors affecting human female fertility and therefore also the pregnancy rate. These factors are ovarian follicle number and size, uterine endometrium thickness, uterine artery haemodynamics, serum follicle stimulating hormone (FSH), serum progesterone levels and corpus luteum vascularity.

Research aims and objectives
1. Establish a sample group of 50 new patients registering for fertility treatment at a London natural health fertility clinic.
2. Test and record a predetermined group of twelve measurements prior to treatment during one menstrual cycle.
3. Administer CHM in capsule form for one menstrual cycle.
4. Re-test the same parameters in the third cycle of treatment, continue to administer CHM for six months (or until pregnancy is achieved if this occurs in less than six months). Follow up six months after the beginning of the last patient’s treatment
5. To determine the number of pregnancies achieved.
6. Analyze results and discuss findings.
7. Draw conclusions and make recommendations for further practice and study.

Methodology

The challenge for any investigative method when applied to traditional Chinese medicine (TCM) is that in everyday practice, the same disease in different patients will have a different treatment principle and herbal prescription. The information collected from the traditional Chinese examination and assessment determines a diagnosis based on pattern differentiation and hence a treatment principle and formula which is individualized for each patient. In our treatment of infertility there is, in addition, a weekly modification of each patient’s formula. As there is thus no standardization of formulae for patients it is not appropriate to discuss the formulae themselves in this study, but rather to simply study the effects of Chinese herbal medicine treatment on female fertility.

The method chosen was a prospective cohort primary study using a sample group of patients registered with the clinic for TCM infertility treatment.

Patients were selected for the study on the basis that they had no Western medical condition which might have affected their fertility. In other words they were described in Western medical terms as having unexplained infertility. They also entered the study on the condition that data obtained in the course of their treatment could be used in the study anonymously.

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**Motility of the endometrium after acupuncture treatment.**

Objective: Acupuncture seems to be a useful tool for improving pregnancy rate after assisted reproduction therapy (ART) as we have shown in a former study. Uterine peristaltic waves may displace the embryo droplet a the time of embryo transfer. To investigate the possible influence of acupuncture on uterine
contractility, we visualized the motility of the endometrium by ultrasound comparing two groups with/without acupuncture treatment shortly before and after embryo transfer.

Design: Prospective cohort study.

Materials and Methods: 164 patients undergoing ART (ICSI, IVF) in our fertility centre were included in this study. Only patients with a morphologically normal uterus were admitted. After in-vitro fertilization up to three embryos were transferred into the uterine cavity on day 2 to 6 after oocyte retrieval. Acupuncture was performed in 95 patients 25 minutes before and after embryo transfer with sterile disposable stainless steel needles (0.25 x 25 mm) at the following locations: Cx6 (Neiguan), Sp8 (Diji), Liv3 (Taichong), Gv20 (Baihui), S29 (Xuehai), Li4 (Hegu) after embryo transfer. After 10 min the needles were rotated in order to maintain Deqi sensation. Additionally we used small stainless needles (0.2 x 13 mm) for auricular acupuncture at the following points without rotation: ear point 55 (shenmen) ear point 58 (Zhigong), ear point 22 (neifenmi), ear point 34 (Naodian). In the control group (n=69) embryos were transferred without any supportive therapy. Just before and after embryo transfer all patients underwent ultrasound scans of a sagittal uterine plane using a 7 MHz transvaginal probe (LOGIQ 400 PRO, GE Medical Systems). A sequence of two minutes was video recorded. For evaluation of uterine contractions the videotape was visually assessed in a fivefold speed. The total time of endometrial movements during the 40 s period of accelerated reproduction was measured. The main outcome measure was the change of uterine motility after embryo transfer. For statistival evaluation of endometrial motility t-test was used.

Results: The basic uterine motility before embryo transfer did not differ between acupuncture group and control group: 19.0 vs. 20.1s (p=0.53). Comparing the endometrial motility before and after embryo transfer we failed to find significant change by acupuncture treatment: acupuncture group vs control group 2.6s + 9.3s (t-test p=0.84).

Conclusion: Acupuncture treatment does not inhibit uterine motility. Other mechanisms may be responsible for the increase of pregnancy rate after acupuncture treatment in ART.

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Ovulation Following Combined 'Therapy With Wen-Jing-Tang and Clomiphene Citrate Therapy in Anovulatory Women

Abstract: The effect of combined therapy with Wen-Jing-Tang and clomiphene citrate on anovulation was studied in 16 infertile patients who did not respond to
clomiphene citrate alone. Wen-Jing-Tang was given at a dose of 5 g a day every day from day 2 of the menstrual cycles and clomiphene citrate was given at 150 mg day for 5 days from day 5 of the cycle. Ovulation occurred in 43.8% of the patients and 48.6% of the cycles. No case of ovarian hyperstimulation syndrome or pregnancy were observed. These results suggest that the combined therapy with Wen-Jing-Tang and clomiphene citrate should be used before therapy with human menopausal gonadotropin.

Addition of Wen-Jing-Tang (Japanese name, Unkeito) to the perfusion medium of rat mediobasal hypothalamus in vitro is reported to increase LH-RH release. Clomiphene citrate (clomiphene) is also known to increase LH-RH release from the hypothalamus, resulting in induction of ovulation in patients with anovulation due to hypothalamic dysfunction. Since the rate of ovulation on clomiphene citrate treatment ranges from 60.5% to 80.5%. some patients do not respond to clomiphene citrate. Therefore, we evaluated the effect of combination treatment with Wen-Jing-Tang and clomiphene in patients who did not ovulate after clomiphene treatment.

Materials and Methods

The subjects studied were 16 infertile women with anovulation who had no other sterility factors and who did not ovulate after three consecutive treatments with 150 mg a day of clomiphene for 5 days. Their average age was 30.6 years (range 24-35 yrs) and their mean (± S.E.) serum levels of LH, FSH and prolactin were 24.5 (± 3.3) mIU/ml, 12.4 (± 1.1) mIU/ml and 12.8 (± 1.4) ng/ml, respectively. The patients were given 5 g of Wen-Jing-Tang daily from the day 2 of the menstrual period. The time of ovulation was determined as that of the high phase of the basal body temperature.

Results

Ovulation occurred in 7 of the 16 patients treated and in 18 of 37 cycles. The rates of ovulation were 43.8% (per patients) and 48.6% (per cycles), respectively. There was no occurrence of the ovarian hyperstimulation syndrome or pregnancy.

Discussion

The present study clearly showed that combined administration of Wen-Jing-Tang clomiphene induced ovulation in patients who did not ovulate following clomiphene therapy. Wen-Jing-Tang is reported to induce LH-RH release from the rat hypothalamus, resulting in increase of LH release from the pituitary in vitro in a sequential double-chamber perfusion system (Miyake et al., 1986. Since clomiphene is effective in cases of anovulation with hypothalamo-pituitary dysfunction, combined therapy with clomiphene and Wen-Jing-Tang induced ovulation by additive actions at the hypothalamo-pituitary level. However, the
The possibility of direct action of these two drugs on the ovaries is not fully excluded. No pregnancy occurred on combined therapy, but this may have been because the study did not cover sufficient subjects and cycles.

No case of ovarian hyperstimulation syndrome was observed in the present study. The rates of ovarian hyperstimulation syndrome by clomiphene alone and Wen-Jing-Tang alone were both less than 5%. These findings suggest that the ovarian hyperstimulation syndrome is rarely induced by this combined therapy. Therefore, this combined therapy should be tried before treatment with human menopausal gonadotropin-human chorionic gonadotropin, which has side effects, such as inductions of multiple pregnancy and the ovarian hyperstimulation syndrome.

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Reference


Preventive and therapeutic effects of Bushen Huoxue Recipe on autoimmune premature ovarian failure in mice

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Objective: To investigate the preventive effect of Bushen Huoxue Recipe (BSHXR), a compound traditional Chinese herbal medicine, on autoimmune premature ovarian failure (POF) in mice. Methods: Ovarian antigen was prepared with the ovarian tissue of female BALB/c mice. A mouse model of POF was established by immunization injection of the ovarian antigen of isotype female mice on multiple subcutaneous sites and two posterior soles. The POF mice were treated with BSHXR after the first and third immunization. The levels of follicle-stimulating hormone (FSH), luteinizing hormone (LH) and estradiol (E2) in peripheral blood were detected by enzyme linked immunosorbent assay. Results: Lymphocyte infiltration was appeared in ovarian stroma of POF mice. The levels of FSH and LH were evaluated and the E(2) level was decreased significantly (P<0.05). BSHXR could reduce the increased levels of FSH and LH, increase the level of E(2) and the number of growing and mature follicles. The efficacy of early treatment was better than that of late treatment. Conclusion: BSHXR can recover ovarian function in POF mice mainly by regulating the indiscriminate hormone level, and BSHXR has preventive effect on autoimmune POF in mice.

Protective effect of zuogui pill on ovarian autoimmune injury

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OBJECTIVE: To probe the effect of Zuogui pill (ZGP), a Chinese compound recipe for tonifying Shen, on ovarian function in mice with premature ovarian failure (POF). METHODS: BALB/C female mice model of POF was established by multiple sites subcutaneous injection of ovarian antigen elicited with ovarian tissue of SD female rats, and treated with ZGP at different time points in the modeling, with prednisone as positive control. The levels of follicle-stimulating hormone (FSH) and estradiol (E2) in peripheral blood were measured with radioimmunoassay, and ovarian antibody (AoAb) was determined by enzyme linked immunosorbent assay. The mRNA expression of ovarian growth and differentiation factor-9 was detected with in situ hybridization. RESULTS: POF model mice manifested such abnormalities as increased FSH, decreased E2, and positive AoAb in peripheral blood, with lymphocytes infiltration in ovarian mesanchyma, reduction of GDF-9 mRNA positive oocytes, and decrease of growing and mature follicles. ZGP could reduce the increase of FSH, increase the level of E2, inhibit the production of AoAb, raise the GDF-9 mRNA positive cells of oocytes, increase the number of growing and mature follicles. The clinical efficacy was more significant in early stage than in advanced stage. CONCLUSION: ZGP can improve immune inflammatory injury of ovary, and shows therapeutic effect on POF.

RESEARCH INTO ACUPUNCTURE AND OVULATORY DYSFUNCTION

4 articles/studies
A study involving 45 infertile women suffering from oligo-amenorrhea (27 cases) or luteal insufficiency (18 cases) was carried out. Following a complete gynaecologic-endocrinologic examination, the women were treated with auricular acupuncture. Results were compared to those of 45 women who received hormone treatment. Both groups were matched for age, duration of infertility, body mass index, previous pregnancies, menstrual cycle and tubal patency. Women treated with acupuncture had 22 pregnancies whereas women treated with hormones had 20 pregnancies. It was also noted that side-effects were observed only during hormone treatment, and various disorders of the autonomic nervous system normalized during acupuncture. The study concluded that "auricular acupuncture seems to offer a valuable alternative therapy for female infertility due to hormone disorder": being more effective than hormone therapy and with no side effects. Auricular acupuncture in the treatment of female infertility.

Gerhard I; Postneek F Department for Gynecological Endocrinology and Reproduction, Women's Hospital, University of Heidelberg, Germany. Gynaecol Endocrinol (ENGLAND) Sep 1992,6 (3) p171.

(2) Acupuncture was used in 15 women with oligo-amenorrhea and 12 women with luteal body insufficiency who had come for hormone consultation because of infertility. In both groups the subsequent incidence of pregnancy was comparable to that achieved by drug therapy. The authors conclude that acupuncture deserves to be more widely used, considering the lack of side effects, the low abortion rate and its positive influence on the patient's general condition compared to drug therapy.


(3) Acupuncture can effectively normalise the hypothalamic-pituitary-ovarian axis and thus regulate ovulation. Studies show that acupuncture may adjust FSH and LH and normalize oestrogen and progesterone levels, thus affecting ovulation. Its efficacy to treat female infertility should be further investigated.


(4) professor Adrian White, of Exeter University reviewed trials on acupuncture for women's reproductive health care and concluded that acupuncture for infertility appears promising and further studies are justified.


Research into Chinese herbal medicine and ovarian dysfunction

9 separate studies

(1) The effectiveness of a Chinese formula called Tian gui fang in comparison with metformin was tested on patients with polycystic ovarian syndrome [PCOS]. The patients were divided into two groups and either Tian gui fang or metformin was administered for three months. After treatment, 4 out of the 8 patients on metformin had restoration of menstrual cyclicity, and two of them had a double phase BBT. The testosterone levels had decreased. No other measures changed. In the group that received the Chinese medicine, 6 patients out of 8 had a restored cycle as well as a double phase BBT. Testosterone and the body mass index (BMI) decreased significantly. The authors conclude that both therapies can induce ovulation but that Chinese herbal medicine has a higher efficacy in restoring ovulation and normal BBT measures.


(2) The effectiveness of a Chinese herbal formulary was tested on patients with high LH levels due to polycystic ovary syndrome. Eight weeks of treatment with Chinese herbal medicine significantly reduced plasma LH.


(3) In Japan, a Chinese herbal formulary was tested on patients with polycystic ovarian disease [PCOD] to find an effective treatment without side effects that could be used instead of clomiphene citrate or gonadotropin therapy. After a
course of treatment, the FSH/ LH ratio had significantly decreased, and the ovulatory rate was 70.6%. Serum testosterone did not change during treatment. The authors conclude that the Chinese formula may be useful for the treatment of anovulation in PCOS patients.


(4) A case study from Taiwan discusses the effectivetreatment of premature ovarian failure using Chinese herbal medicine. Clomiphene citrate therapy over 8 months had not changed the FSH and LH levels from the postmenopausal range. A course of 4 months treatment with Chinese herbal medicine based on Zuo gui wan induced an ovulation, and the patient fell pregnant. The authors conclude that Chinese herbal medicine can restore ovarian function effectively and promptly and offers another option for treating infertility in patients with premature ovarian failure.


(5) At Shanghai medical university, the effectiveness of Chinese medical herbs from the category of yin supplementing were tested on 35 patients with polycystic anovulation. The patients were treated for three months, and a variety of tests were carried out before and after the course of treatment. Testosterone levels lowered significantly. In 59.7% of patients and a regular cycle was reestablished. 41.2% of women became pregnant. The authors conclude that Kidney Yin nourishing herbs could provide a good microcircumstance for ovarian follicular growth, which results in ovulation and pregnancy.


(6) Hachimijiogan, a Chinese herbal formulary (Liu wei dihuang wan + rou gui, yin yang huo, huang qi), was shown in one study to benefit female infertility due to pituitary dysfunction. Two infertile women (one with and one without a pituitary adenoma) who were resistant to medical treatment, were given Hachimijiogan which subsequently reduced the serum prolactin level, and resulted in a normal ovulatory cycle and pregnancy, without side effects.

(7) In another study looking at pituitary dysfunction causing infertility, 27 women were given the same formulae as discussed above. 6 of the women had amenorrhea. In 15 patients, the prolactin level dropped to a healthy range, and remained low 6 months after the course of treatment. Four patients with amenorrhea ovulated. Eleven patients conceived and delivered a healthy baby. In three women, the prolactin level did not lower. The authors conclude that a modification of Liuwei di huang wan can be a safe and effective treatment for hyperprolactinemic women.


(8) In one study of female infertility, 53 patients with luteal phase defect (LPD) were treated with different Chinese medicinal herbs at different phases of menstrual cycle. The patients were treated for three menstrual cycles and there was significant improvement in the luteal phase of endometrium, and a tendency for normalization of the wave forms and its amplitude after the treatment. The findings suggested that Chinese herbal medicines are capable of replenishing the Kidney and regulate the hypothalamus-pituitary-ovarian axis and thus improve the luteal function. Among the 53 cases, 22 (41.5%) conceived but 68.18% of them required other measures to preserve the pregnancy.


(9) Women with normal menstrual cycles but low basal body temperature and progesterone levels (luteal insufficiency) were effectively treated with a Chinese herbal formulary called Dang guishao yao tang, with no observed side effects.


**RESEARCH INTO ENDOMETRIOSIS AND CHINESE HERBAL MEDICINE**

A study from Beijing compared three treatment methods to find the most effective treatment for endometrial ovarian cysts. 152 patients with endometrial ovarian cysts were divided into three groups: an integrated laparoscopy and Chinese herbal medicine (combination group), a Chinese herbal medicine group, and a Danazol group. The clinical efficacy, side-effects and reproductive hormones were compared. The shrinking rate and disappearance rate of the cysts were highest in the combination group as was the pregnancy rate. Few side effects were noticed in the combination and Chinese herbal medicine group. The authors conclude that combining laparoscopy with Chinese herbal medicine is an
effective treatment for endometrial ovarian cysts with minimal side effects and a maximal preservation of the reproductive function.


(2) A study was carried out in Shanghai to explore the mechanism of treating endometriosis by tonifying Kidney and removing blood stasis with Neiyixiao Recipe (NYXR). METHODS: One hundred and three patients with endometriosis were divided randomly into the NYXR group (58 cases, treated with NYXR) and the control group (45 cases, treated with danazol) and were reviewed for the improvement of clinical symptoms, serum level of FSH, LH, PRL, E2, P and T, humoral and cellular immunity (C3, C4, CD3, CD4, CD8), and plasma prostaglandin after treatment. RESULTS: There was no significant difference in effect between the NYXR group and the control group in relief of dysmenorrhea and degradation of elevated plasma prostaglandin (chi2 = 0.71, P > 0.05). But there was significant difference between the two groups in curing infertility (chi2 = 14.77, P < 0.01), and the effect of NYXR in regulating endocrine and immunity was significantly better than that of danazol. The authors conclude that by tonifying Kidney and removing blood stasis, Chinese herbal medicine is an effective method for the treatment of endometriosis, simultaneously maintaining and improving fertility.


(3) A study in Shanghai tested the therapeutic mechanism of endometriosis by the treatment of Yiqi Huoxue Huayu Tongfu Principle (YQHXHYTFP, tonifying Qi and promoting blood circulation to remove stasis and purgation therapy) with Neiyi 1+ pill. METHODS: Forty-five cases with endometriosis were divided randomly into TCM group (30 cases, treated with Neiyi 1+ pill) and the control group (15 cases, treated with tamoxifen). The activity of natural killer cell of peripheral blood, T lymphocyte subsets, secreting interleukin-II and the EmAb were determined. RESULTS: Endometriosis is associated with immunologic disturbance. After treatment, the activity of NK cells and the count of T-suppressor cells were significantly increased (P < 0.01), the count of T-helper cells, the secretion of interleukin-II and TH/TS ratio were significantly reduced (P < 0.01). Over 50% of the cases whose EmAb was positive eventually turned to negative. The effective rate of this therapy was 90%. There was no significant difference between TCM group and the control group. CONCLUSION: Chinese herbal medicine could modulate the immunologic disturbance in women with endometriosis, and could clearly improve clinical symptoms and signs.

(4) A study in Kunmin aimed to find a medicine that treats endometriosis effectively with less side-effects. METHODS: A Chinese herbal prescription [Dan'e mixture] (DEM, consists of Radix Salviae Miltiorrhizae and Rhizoma Zedoariae) was used to treat 189 cases of endometriosis and the change of symptom and sign, the B ultrasonograph, the anti-endometrium antibody and endometriosis quantitative diagnostic index were observed. Another 160 cases were treated with Danazol as control. RESULTS: One hundred and eighty-nine cases were treated for 9 months. According to National Standards, 39 cases (20.6%) were cured, 67 cases (35.4%) were markedly effective, 67 cases (35.4%) were effective, and 16 cases (8.4%) were ineffective. Compared with 160 cases treated with Danazol for 9 months, the total effective rates were 95% and 91.5% respectively, the difference between them was insignificant. Animal eximents showed similar results to the clinical ones. CONCLUSION: The authors conclude that the Chinese herbal prescription is as effective as Danazol for the treatment of endometriosis, without observed side effects. It is particularly helpful for diagnosis, treatment and prevention of endometriosis in the early stage.


(5) Another study from Shanghai observed the clinical effectiveness of Chinese herbal medicine on endometriosis and the uterine arterial blood flow. The study group consisted of 53 women with endometriosis who manifested with dysmenorrhea, menoxenia, ovarian chocolate cysts and enlarged uterus. The control group consisted of ten women with normal regular menstrual cycle. This article deals with the method of using the hemodynamic index of uterus arterial blood flow. After treatment the blood flow amount of uterus arteries of 53 cases (study group) obviously decreased and their uterus arterial blood flow speed reduced markedly as compared with pre-treatment status, (P < 0.001 and P < 0.01 respectively), while pre-treatment group was significantly higher than that of control group (P < 0.001). After medical treatment for 3.5 months, symptoms such as dysmenorrhea (period pain) and menstrual disorder basically disappeared. 22 ovarian chocolate cysts became smaller and 16 disappeared. The pregnancy rate was 45%. The data of this study suggest that the mechanism of treatment of promoting blood circulation to remove stasis might be closely related to the regulation of physico-chemical characteristics of blood and the adjustment of hemodynamics.

RESEARCH INTO RECURRENT MISCARRIAGE & CHINESE HERBAL MEDICINE

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In 40 women with threatened abortion and a history of miscarriage, blood test showed threatened abortion (TA), compared to the blood test of normal pregnant women (The plasma beta-EP level in TA was significantly higher than that in normal pregnant women, P < 0.01. On the contrary, plasma GnRH, HCG and P4 were obviously lower in TA as compared with those of the normal cases, P < 0.01.) After treatment with Chinese herbal medicine that supported reproduction and blood circulation and protected the foetus, 36 of the 40 patients continued their pregnancy without symptoms of TA, and the above-mentioned four criteria measured at 10-12th week of gestation were similar to those of normal cases, P > 0.05. The authors concluded that Chinese herbal Medicine can regulate plasma beta-EP and placental endocrine function in threatened abortion in women with a history of recurrent miscarriage.


(2) A study in Japan showed that recurrent miscarriages with an immunological component (rejection of the foetus as foreign) benefit positively to the treatment with Chinese herbal medicine. Twelve patients with recurrent abortion who had shown positive anti-phospholipid antibodies were treated through the administration of a Japanese modified traditional Chinese herbal medicine Sairei-To (Cai ling Tang). The patients had experienced a total of 27 spontaneous abortions in their previous pregnancies and had no other pregnancy history except for one patient. The patients were treated with 9.0 g of Sairei-To per day before their next pregnancy. The positive value of antiphospholipid antibodies returned to negative in 9 patients out of 12 patients through the treatment. Out of 12 patients, 10 patients continued their new pregnancy uneventfully, and they delivered an offspring (Success rate: 83.3%). Thus, the current treatment was considered to be an effective therapy for patients with recurrent abortion whose miscarriage is immune related (positive anti-phospholipid antibodies).


Study on Treatment of polycystic ovarian syndrome with Infertility by combined therapy of Chinese herbal medicine and compound cyproterone acetate
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Abstract  Objective: To evaluate the effect of combined therapy of Chinese herbal medicine and compound cyproterone acetate (CPA) in treating non-obesity polycystic ovarian syndrome (PCOS) and to explore its mechanism in improving withdrawal ovulation.

Methods: Eighty-six patients of non-obesity PCOS, typed as Shen-deficiency with blood stasis Syndrome or Shen-deficiency with Phlegm-Dampness Syndrome by Syndrome Differentiation in traditional Chinese medicine, were randomly divided into three groups: (1) The TCM group (n=26) was treated with Chinese drugs for 6 menstrual cycles; (2) The western medicine (WM) group (n=30) was treated with 1 tablet of CPA for 21 days, with the treatment beginning from the 5th day of menstruation. The treatment was given for 3 menstrual cycles by repetitious medication, which stopped and restarted on the 5th day of withdrawal bleeding. Then the ovulation promoting therapy was applied by using clomifene citrate and human chorionic gonadotropin (CC/hCG) for 3 menstrual cycles; (3) The TCM-WM group (n=30) was treated with the medications used for the above two groups. The menstrual cycle, the volume and duration of the menstruation, as well as the improvement of acne and pilosis [Ferrinian-Gallway (F-G) scoring] were observed after 3 cycles ended. Moreover, condition of ovulation was monitored by B-ultrasonography at the 4th-6th cycle and status of pregnancy was observed.

Results: Compared with before treatment, the blood level of luteinizing hormone (LH) and testosterone (T) in all 3 groups after treatment significantly decreased (P<0.05), with its ratio to follicle-stimulating hormone (LH/FSH) recovered to normal, but without markedly change in levels of FSH, estradiol (E2) and prolactin (PRL). The menstrual cycle in most patients got regular and acne significantly alleviated (P<0.05), and the improvement of infrequent menstruation and acne was better in the WM group and the TCM-WM group than that in the TCM group, but pilosis showed no significant improvement in all three groups. The periodical ovulation rate in the TCM-WM group (73.1%) and the WM group
(68.3%) was significantly higher than that in the TCM group (40%). The pregnancy rate in the TCM-WM group (53.8%) was significantly higher than that in the other two groups (26.1% and 25% respectively, all P<0.05).

Conclusion: Using combined therapy of TCM and composite CPA followed by ovulation promoting agents of TCM and WM to treat patients of non-obesity PCOS could relieve the clinical symptoms, improve the abnormal blood level of sex hormones and significantly elevate the pregnancy rate.

Substitution of Acupuncture for HCG in Ovulation Induction

By using human menopausal gonadotropin (HMG) and human chorionic gonadotropin (HCG), fairly good clinical therapeutic efficacy has been obtained in the treatment of infertility. However, difficulties are brought about due to the ovarian hyperstimulation syndrome (OHSS) easily induced by these two drugs. Therefore, we attempted to use acupuncture instead of HCG in the induction of ovulation from 1989 to 1992, and satisfactory therapeutic effect was achieved as reported in the following.

General Data

Ten patients were hospitalized with confirmed diagnosis of infertility and totally observed for 11 menstrual cycles (one patient had recurrence of OHSS for 2 times). Their ages ranged from 27 to 30 years with an average of 29 years. After treatment by HMG, all patients manifested OHSS in varying degrees. In accordance with the criteria for grading of OHSS issued by WHO, among these 11 menstrual cycles 4 cycles were mild (ovarian slight enlargement less than 5 cm with symptoms of slight malaise of lower abdomen); 7 were moderate (marked enlargement of ovary with nausea, vomiting and abdominal distension); no severe case occurred (extreme enlargement of ovary with hydrothorax, ascites, pycnemia and electrolyte disturbance). In order to prevent the exacerbation of OHSS caused by combined use of HMG and HCG, acupuncture was used after HMG treatment to replace HCG for the ovulation induction in 11 menstrual cycles of these patients.

Therapeutic Method

1.5-3 cun long filiform needles (no. 28-30) were used. The acupoints used for needling were Zigong (Extra 16), Shenshu (UB 23), Ciliao (UB 32), (the above acupoints were used bilaterally) and Guanyuan (Ren 4). Baohuang (UB 53) and Zhongji (Ren 3) were selected according to the signs and symptoms as adjuvant points. The manipulation techniques included twirling, rotating, lifting and thrusting. Reinforcing method was used in Shenshu point and the remaining points were punctured by reducing manipulation. The needling sensation should be transmitted toward both sides of lower abdomen. When arrival of Qi, retained the needles for 15 min. and manipulated the needles intermittently during the
retaining period to enhance the stimulation. Moxibustion with moxa stick was used for some of these acupoints.

Observation of Therapeutic Effect

Criteria for assessment of therapeutic effect: Therapeutic effect was appraised mainly by comparison of ultrasonic B examination after needling with that before treatment and referred to the score of cervix uteri and basal body temperature to sit judgment on ovulation. Ovulation occurred within 24 h after 1st needling was considered as marked effect; ovulation within 72 h after 2-3 times of needling was effective; no ovulation occurred after 72 h after more than 3 times of needling was scored as ineffective.

Results of Treatment

Of the 11 menstrual cycles, marked effect was shown in 5 cycles, effective in 5 cycles and failed in 1 cycle. Among the 10 markedly effective and effective cycles, ovulation was induced in 2 cases after needling and diagnosed pregnancy by blood HCG assay and ultrasonography. In 9 of the 10 cycles treated with acupuncture for ovulation induction without using HCG and other drugs, the symptoms of OHSS were significantly remitted or even disappeared. Only in one cycle, HCG (with dosage less than for ovulation) was used after needling to maintain the function of corpus luteum and resulted in exacerbation of OHSS and finally remitted by drug treatment.

Typical Case

Fang, 27-year-old, suffered from polycystic ovary syndrome. She was unpregnant after married 2 years and the menstruation was only 1-2 times a year. The basal body temperature was monophase. No effect was observed using clomiphene and then treated with HMG. From the day 5, for bleeding due to withdrawal of progesterone, intramuscular injection of HMG was given at a dose of 150 U once a day for 8 days. The score of cervix uteri was 12 mark. The ultrasonogram showed that the size of right ovary was 9.6 cm x 7.8 cm x 4.6 cm and the left side was 9.2 cm x 7.2 cm x 4.7 cm. Both sides of ovary had 10-20 follicles with maximum size 1.8 cm. In order to avoid severe OHSS, acupuncture was used instead of HCG for ovulation induction after stopping HMG treatment. On the next day after the first needling, the basal body temperature elevated from 36.3°C to 36.8°C and the score of cervix uteri fell from 12 mark to 9 mark, and ultrasonic B examination suggested that part of the follicles were ovulated. After the 19th day of ovulation, the blood concentration of HCG started rising and after 40 days the blood level of HCG reached to 35.6 ng/ml. The ultrasonogram showed that the diameter of embryonic sac was 1.5 cm and early pregnancy was diagnosed.

Discussion
It was reported in literature that using HMG-HCG in the induction of ovulation, the ovulatory rate was about 70%-90%, but the incidence of OHSS might be 10%-15.4% and even life-threatening in the severe case. At present, there were no satisfactory measures for the prevention and remission of OHSS. In most reports, it is considered that when OHSS inclines to occur, stopping injection of HCG is the effective way to avoid severe OHSS. However, stopping HCG would not only discontinue the ovulation of HCH, but also gave up the already developed follicles. Our clinical practice demonstrated that acupuncture is effective in ovulation induction and also the remission of OHSS induced by HMG. Furthermore, we also noted that in most OHSS patients enlarged ovaries and numerous developed follicles were revealed. As a result of excessive follicles developed, dysplasia of ova and insufficiency of corpus luteum often occurred, thus leading to uneasy pregnancy after ovulation. So it is reasonable to infer that using some Chinese drugs benefiting the function of corpus luteum or using certain amount of progesterone as supplementary treatment after acupuncture, the pregnancy rate could be raised.

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The role of acupuncture in the management of subfertility.

The role of acupuncture in the management of subfertility.
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OBJECTIVE: To review systematically the use of acupuncture in the management of subfertility. DESIGN: A computer search was performed via several English and Chinese databases to identify journals relevant to the subject. RESULT(S): The positive effect of acupuncture in the treatment of subfertility may be related to the central sympathetic inhibition by the endorphin system, the change in uterine blood flow and motility, and stress reduction. Acupuncture may help restore ovulation in patients with polycystic ovary
syndrome, although there are not enough randomized studies to validate this. There is also no sufficient evidence supporting the role of acupuncture in male subfertility, as most of the studies are uncontrolled case reports or case series in which the sample sizes were small. Despite these deficiencies, acupuncture can be considered as an effective alternative for pain relief during oocyte retrieval in patients who cannot tolerate side effects of conscious sedation. The pregnancy rate of IVF treatment is significantly increased, especially when acupuncture is administered on the day of embryo transfer. CONCLUSION(S): Although acupuncture has gained increasing popularity in the management of subfertility, its effectiveness has remained controversial.

**Vitamin C supplements beneficial during IVF treatment**

Source: Central European Journal of Public Health 2003; 11: 63-7

Investigating the impact of vitamin C supplementation on IVF outcomes.

Vitamin C supplementation may have a direct, favorable influence on IVF outcomes, but this beneficial effect appears to be attenuated by smoking, say researchers.

Prof. Igor Crha and colleagues from Masaryk University in Brno, Czech Republic, studied the influence of vitamin C on infertility treatment in 76 women undergoing IVF embryo transfer cycles. Thirty-eight women were assigned to receive vitamin C (ascorbic acid) in a daily oral dose of 500 mg, while the control group received no supplements. In each group, half of the women were smokers, and half non-smokers. Urinary and follicular fluid levels of ascorbic acid were measured at baseline, and at the time of oocyte retrieval.

After treatment, ascorbic acid levels in the follicular fluid were significantly higher in women who had received vitamin C supplements than in those who had not, indicating a local effect on the ovaries. In addition, the pregnancy rate was significantly higher in the vitamin C group than the controls (34 percent versus 24 percent). However, this effect was significantly more pronounced in non-smokers than smokers.

The findings support the benefits of vitamin C supplementation during IVF treatment, but the negative effect of smoking may be "a reason for asking women to cease smoking prior to infertility treatment," say the researchers.

**Acupuncture boosts sperm quality in infertile men**

Researchers demonstrate a significant improvement in specific aspects of sperm quality following a period of acupuncture use.
Acupuncture appears to be a simple method for improving the ultrastructure, and therefore quality, of sperm in men with unexplained infertility, research indicates.

"The treatment of idiopathic infertility could benefit from employing acupuncture," states the team, led by Jian Pei from Shanghai University of Traditional Chinese Medicine in the People's Republic of China.

Acupuncture for men undergoing assisted reproductive technology (ART) has already been shown to have positive effects on sperm quality, fertilization rates, and pregnancy rates.

To evaluate its effects on sperm structure in detail, the researchers used transmission electron microscopy to study ejaculates from 40 men with unexplained infertility, 28 of whom received acupuncture twice a week for 5 weeks.

After acupuncture, a statistically significant increase in the percentage and number of sperm in the total ejaculate without ultrastructural defects was observed, in comparison with controls, with improvements in the shape of the acrosome and nucleus. No change in specific pathologies, such as apoptosis, necrosis, or immaturity, however, was apparent.

Encouraged by these results, Pei et al recommend: "In conjunction with ART or even for reaching natural fertility potential, acupuncture treatment is a simple, noninvasive method that can improve sperm quality."

Source: Fertility and Sterility 2005; 84: 141-7

**An experimental study on inhibitory effect of Chinese medicine tai-bao on antisperm antibody**

**OBJECTIVE:** To investigate whether Chinese medicine Tai-bao could inhibit antisperm antibody in experimental mice.

**METHODS:** The experimental immunoinfertility mice were due to antisperm antibody induced by injection of human sperm membrane antigens. The experimental immuno-infertile mice used in the present study were divided into four groups including Tai-bao high dose group (46.8 g.kg-1.d-1), Tai-bao low dose group (31.2 g.kg-1.d-1), prednisone group and normal saline group. The enzyme linked immune sorbent assay (ELISA) and microcytotoxic assay were used for detection of antisperm antibody. The change of levels of antisperm antibody before and after treatment, pregnant rate, and the number of implantation were investigated in tested mice.

**RESULTS:** The pregnant rates in normal saline group, prednisone group, Tai-bao high dose group and low dose were 38.89%, 47.06%, 70.00% and 75.00% respectively. The rate of pregnancy in Tai-bao low dose group was significantly
higher as compared with normal saline group (P < 0.05). The rate of implantation in Tai-bao low dose group was significantly higher than that in prednisone group (P < 0.05). The results of detection of cytotoxic antibody to sperm showed that cytotoxic percentages in Tai-bao high dose group (63.0 +/- 10.3%) and prednisone group (56.3 +/- 13.7%) were significantly lower (P < 0.05 and P < 0.01) than that in normal saline group (72.84 +/- 5.05%).

CONCLUSION: Chinese medicine Tai-bao possesses regulatory effect on reproductive immune function, inhibitory effect on antisperm cytotoxic antibody, and promoting effect on pregnancy.

Lai AN; Song JF; Liu XJ Xiyuan Hospital, China Academy of TCM, Beijing. Chung Kuo Chung Hsi I Chieh Ho Tsa Chih, 17(6):360-2 1997 Jun (ISSN: 1003-5370)

Clinical study on the treatment of male immune infertility by Huzhangdanshenyin

OBJECTIVE: To investigate the efficacy of the Chinese medicine Huzhangdanshenyin on male immune infertility, and provide an effective therapy for this disease. METHODS: Ninety men with immune infertility were selected as the research subjects and randomly divided into two groups, 60 in the treatment group, treated by Huzhangdanshenyin, and the other 30 in the control, treated by prednisone, both for 3 months. The improvement of clinical symptoms, immunologic indexes (antisperm antibodies in serum and seminal plasma) and sperm indexes (semen liquefied duration, motility, viability, density and abnormal morphology rate) were observed and the results analyzed. RESULTS: The total antisperm antibody reversing ratio of the treatment group was higher than that of the control (P < 0.01), especially the serum antisperm antibody reversing ratio. There were significant differences in the clinical cure rate and total validity rate between the treatment group and the control (P < 0.01). After the treatment, the markers of the clinical symptoms (P < 0.01), especially the serum antisperm antibody reversing ratio. There were significant differences in the clinical cure rate and total validity rate between the treatment group and the control (P < 0.01). After the treatment, the markers of the clinical symptoms were lower (P < 0.01), and the improvement of the clinical symptoms was better in the treatment group than in the control (P < 0.01), especially the symptoms of pain in the back and knees, distending and bearing-down sensation of the perineum and testis, hypersexuality and topoalgia. Compared with pre-treatment, sperm motility and viability of the treatment group significantly improved (P < 0.01), and so did sperm density (P < 0.05). However, there were no significant differences in sperm density, semen liquefied duration, abnormal morphology rate and pH (P > 0.05) before and after the treatment.

CONCLUSION: The Chinese medicine Huzhangdanshenyin works more effectively than prednisone in the treatment of male immune infertility. It could improve the antisperm antibody reversing ratio, clinical symptoms and signs and ameliorate sperm indexes with no obvious adverse effects.
Direct effects of Chinese herbal medicine "hachuekkito" on sperm movement

BACKGROUND AND PURPOSE: Chinese herbal medicine, "Hochuekkitto" is widely used for male infertility in Japan. There have been many reports concerning its clinical usefulness but very few reports of in vitro experiments studying the mechanism of its effects. In addition to stimulating germ cells, we analyzed its direct effects on sperm using computer assisted semen analyzer (CASA).

MATERIALS AND METHODS: Motile sperm were prepared using swim up technique from semen collected from ten healthy volunteers. Sperm movements (motility, velocity, linearity) were analyzed by CASA after adding either serum containing anti-sperm antibody (ASA) or normal serum with or without Hochuekkito.

RESULTS: Two hours after adding serum with ASA, the decrease of sperm motility was significantly reduced from 25.1% (92.8%->67.7%) to 12.5% (92.9%->80.6%) by adding Hochuekkito. No significant difference in velocity and linearity was observed between two groups. By adding normal serum, any of three parameters differed significantly with or without Hochuekkito.

CONCLUSION: Protective effects of Hochuekkito on sperm was suggested. Although normal sperm with ASA was used in this report, since the sperm of infertile patients are said to be more fragile, this results imply that direct protective effect is one of the mechanism of Hochuekkito for male infertility.

Effect of acupuncture on sperm parameters of males suffering from subfertility related to low sperm quality.

The aim of this prospective controlled study was to assess the effect of acupuncture on the sperm quality of males suffering from subfertility related to sperm impairment. Semen samples of 16 acupuncture-treated subfertile patients were analyzed before and 1 month after treatment (twice a week for 5 weeks). In parallel, semen samples of 16 control untreated subfertile males were examined.
Two specimens were taken from the control group at an interval of 2-8 months. The expanded semen analysis included routine and ultramorphological observations. The fertility index increased significantly (p < or = .05) following improvement in total functional sperm fraction, percentage of viability, total motile spermatozoa per ejaculate, and integrity of the axonema (p < or = .05), which occurred upon treatment. The intactness of axonema and sperm motility were highly correlated (corr. = .50, p < or = .05). Thus, patients exhibiting a low fertility potential due to reduced sperm activity may benefit from acupuncture treatment.

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Effects of acupuncture and moxa treatment in patients with semen abnormalities.

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Abstract: AIM: To evaluate the effect of Chinese Traditional Medicine, acupuncture and moxa treatment, on the semen quality in patients with semen abnormalities. METHODS: In a prospective, controlled and blind study, nineteen patients, aged 24 years approximately 42 years and married for 3 years approximately 11 years without children with semen abnormalities in concentration, morphology and/or progressive motility without apparent cause, were randomized into two groups and submitted to acupuncture and moxa treatment at the therapeutic (Study Group) and the indifferent points (Control Group), respectively, for 10 weeks. Semen analyses were performed before and after the treatment course. RESULTS: The patients of the Study Group presented a significant increase in the percentage of normal-form sperm compared to the Control Group (calculated U=16.0, critical U=17.0). CONCLUSION: The Chinese Traditional Medicine acupuncture and moxa techniques significantly increase the percentage of normal-form sperm in infertile patients with oligoastenoteratozoospermia without apparent cause.


Fertility and Organic Living
In a study of Danish greenhouse workers, an unexpectedly high sperm count was found among organic farmers, who grew their products without the use of pesticides or chemical fertilizers. The sperm count was more than twice as high in these men as in a control group of blue-collar workers. Although these findings are not definitive, they suggest that consuming organically grown foods may enhance fertility.

Environmental exposures (e.g., formaldehyde), smoking, and use of recreational drugs (e.g., marijuana, cocaine, hashish) may reduce sperm count or cause abnormal sperm morphology (shape). Smoking adversely affects the semen quality of infertile men.


**Influence of acupuncture on idiopathic male infertility in assisted reproductive technology.**

Abstract:

The clinical effects of acupuncture on idiopathic male infertility in sperm parameter and on therapeutic results in assisted reproductive technology were investigated. 22 patients failed in intracytoplasmic sperm injection (ICSI) with idiopathic male infertility were treated with acupuncture twice weekly for 8 weeks, followed by ICSI treatment again. The sperm concentration, motility, morphology, fertilization rates and embryo quality were observed. Quick sperm motility after acupuncture (18.3% +/- 9.6%) was significantly improved as compared with that before treatment (11.0% +/- 7.5%, P < 0.01). The normal sperm ratio was increased after acupuncture (21.1% +/- 10.4% vs 16.2% +/- 8.2%, P < 0.05). The fertilization rates after acupuncture (66.2%) were obviously higher than that before treatment (40.2%, P < 0.01). There was no significant difference in sperm concentration and general sperm motility between before and after acupuncture. The embryo quality after acupuncture was improved, but the difference between them was not significant (P > 0.05). Acupuncture can improve sperm quality and fertilization rates in assisted reproductive technology.
Male genital tract antioxidant enzymes: their ability to preserve sperm DNA integrity.

Male germ cells are unique because they lose a bulk of their cytoplasm as cytoplasmic droplets when they develop, leading to a decrease in endogenous antioxidant and hence a dependence on extracellular antioxidant system to overcome oxidative stress. Spermatozoa are particularly vulnerable to oxidative stress because their plasma membrane is rich in polyunsaturated fatty acids and membrane-bound NADPH oxidase. To protect spermatozoa from oxidative attack, an optimal amount of reactive oxygen species is maintained by balancing the reactive oxygen species generated during sperm maturation in the epididymis and antioxidants in secretions of the male reproductive tract. The male accessory sex glands secretions have been shown to be the major source of antioxidant enzymes in the ejaculate and have the important function of preserving sperm DNA integrity from oxidative stress experienced in the uterine environment. In our in vivo golden hamster model, ablation of the five major accessory sex glands, namely the ampullary glands, coagulating glands, dorsolateral prostate, ventral prostate and seminal vesicle, was found to cause higher incidence and greater degree of DNA damage in spermatozoa. These damaged sperm are able to undergo fertilization at the same rate as intact ones; however, the outcome of embryos sired is seriously affected.

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Is there a relationship between cell phone use and semen quality?

This study was conducted to determine a possible relationship between regular cell phone use and different human semen attributes. The history-taking of men in our university clinic was supplemented with questions concerning cell phone use habits, including possession, daily standby position and daily transmission times. Semen analyses were performed by conventional methods. Statistics were calculated with SPSS statistical software. A total of 371 were included with the proportion of rapid progressive motile sperm ($r = -0.12$ and $r = -0.19$, respectively), and positively with the proportion of slow progressive motile sperm ($r = 0.12$ and $r = 0.28$, respectively). The low and high transmitter groups also differed in the proportion of rapid progressive motile sperm (48.7% vs. 40.6%). The prolonged use of cell phones may have negative effects on the sperm motility characteristics.

Mechanisms of male infertility: role of antioxidants.

Defective sperm function is the most common cause of infertility, and until recently, was difficult to evaluate and treat. Mannalian spermatozoa membranes are rich in poly unsaturated fatty acids and are sensitive to oxygen induced damage mediated by lipid peroxidation. Hence, free radicals and reactive oxygen species [ROS] are associated with oxidative stress and are likely to play a number of significant and diverse roles in reproduction. The excessive generation of reactive oxygen species by abnormal spermatozoa and by contaminating leukocytes [leukocytospermia] has been identified as one of the few defined etiologies for male infertility. Moreover, environmental factors, such as pesticides, exogenous estrogens, and heavy metals may negatively impact spermatogenesis since male sperm counts were declined. IN addition, again is also likely to further induce oxidative stress. Limited endogenous mechanisms exist to reverse these damages. In a normal situation, the seminal plasma contains antioxidant mechanisms which are likely to quench these ROS and protect against any likely damage to spermatozoa. However, during genitourinary infection/inflammation these antioxidant mechanisms may downplay and create a situation called oxidative stress. Assessment of such oxidative stress status [OSS] may help in the medical treatment of male infertility by suitable antioxidants. The cellular damage in the semen is a result of an improper balance between ROSS generation and scavenging activities. Therefore, numerous antioxidants such as vitamin C, vitamin E, glutathione, and coenzyme Q10, have proven beneficial effects in treating male infertility. A mulit-faceted therapeutic approach to improve male fertility involves identifying harmful environmental and occupational risk factors, while correcting underlying nutritional imbalances to encourage optimal sperm production and function.

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Influence of acupuncture on idiopathic male infertility in assisted reproductive technology.

Abstract:

The clinical effects of acupuncture on idiopathic male infertility in sperm parameter and on therapeutic results in assisted reproductive technology were investigated. 22 patients failed in intracytoplasmic sperm injection (ICSI) with idiopathic male infertility were treated with acupuncture twice weekly for 8 weeks, followed by ICSI treatment again. The sperm concentration, motility, morphology, fertilization rates and embryo quality were observed. Quick sperm motility after acupuncture (18.3% +/- 9.6%) was significantly improved as compared with that
before treatment (11.0% +/- 7.5%, P < 0.01). The normal sperm ratio was increased after acupuncture (21.1% +/- 10.4% vs 16.2% +/- 8.2%, P < 0.05). The fertilization rates after acupuncture (66.2%) were obviously higher than that before treatment (40.2%, P < 0.01). There was no significant difference in sperm concentration and general sperm motility between before and after acupuncture. The embryo quality after acupuncture was improved, but the difference between them was not significant (P > 0.05). Acupuncture can improve sperm quality and fertilization rates in assisted reproductive technology.

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Publication Type: Journal Article

Quantitative evaluation of spermatozoa ultrastructure after acupuncture treatment for idiopathic male infertility

Objective: To evaluate the ultramorphologic sperm features of idiopathic infertile men after acupuncture therapy. Design: Prospective controlled study. Setting: Christian-Lauritzen-Institut, Ulm, IVF center Munich, Germany, and Department of General Biology, University of Siena, Siena, Italy. Patient(s): Forty men with idiopathic oligospermia, asthenospermia, or teratozoospermia.

Intervention(s)
Twenty eight of the patients received acupuncture twice a week over a period of 5 weeks. The samples from the treatment group were randomized with semen samples from the 12 men in the untreated control group.

Main Outcome Measure(s)
Quantitative analysis by transmission electron microscopy (TEM) was used to evaluate the samples, using the mathematical formula based on submicroscopic characteristics.

Result(s)
Statistical evaluation of the TEM data showed a statistically significant increase after acupuncture in the percentage and number of sperm without ultrastructural defects in the total ejaculates. A statistically significant improvement was detected in acrosome position and shape, nuclear shape, axonemal pattern and shape, and accessory fibers of sperm organelles. However, specific sperm pathologies in the form of apoptosis, immaturity, and necrosis showed no statistically significant changes between the control and treatment groups before and after treatment.

Conclusion(s)
The treatment of idiopathic male infertility could benefit from employing acupuncture. A general improvement of sperm quality, specifically in the ultrastructural integrity of spermatozoa, was seen after acupuncture, although we did not identify specific sperm pathologies that could be particularly sensitive to this therapy.

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Research Into Acupuncture and Abnormality of Sperm

Sperm morphology A study in treating subfertility by acupuncture was carried out in Germany on 28 men. Each patient received a total of 10 treatments for a period of three weeks. The spermiograms and hormone levels were checked before and after acupuncture. Total count, concentration and motility were evaluated and in all cases the researchers observed a statistically significant improvement of sperm quality. The authors conclude that acupuncture therapy at the time of ovulation might increase the chances of a pregnancy.

(5) A Chinese study was carried out on 54 males with impaired fertility. 1-3 months of acupuncture therapy was given, and sperm analysis carried out before and after treatment. 55.5% of patients impregnated their partners in that period of time, and 24% showed a significant improvement in sperm parameters. 20% of patients, previously diagnosed with azoospermia and immune disturbance, did not improve. The best improvement was seen in patients with abnormal sperm.

Qian, Z [Clinical observation of 54 cases of male infertility treated by acupuncture and moxibustion] Journal of Chinese Medicine, 1996 Sep; 52.

(6) A Chinese study was carried out on 248 males who suffered from sperm abnormalities, absence of ejaculation and impotence. Treatment of acupuncture was given every other day. 20 treatments comprised one course. 2 courses were given (approx 2 months). About half of the patients with abnormal sperm achieved good sperm count and motility. (20-60mill/ml with 20-60% motility and less than 20% deformity). 52 % of patients with abnormal sperm failed to
respond, a large percentage of those (40%) who were diagnosed with azoospermia, failed to respond at all.


**Soy food and isoflavone intake in relation to semen quality parameters among men from an infertility clinic**

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**BACKGROUND:** High isoflavone intake has been related to decreased fertility in animal studies, but data in humans are scarce. Thus, we examined the association of soy foods and isoflavones intake with semen quality parameters.

**METHODS:** The intake of 15 soy-based foods in the previous 3 months was assessed for 99 male partners of subfertile couples who presented for semen analyses to the Massachusetts General Hospital Fertility Center. Linear and quantile regression were used to determine the association of soy foods and isoflavones intake with semen quality parameters while adjusting for personal characteristics.

**RESULTS:** There was an inverse association between soy food intake and sperm concentration that remained significant after accounting for age, abstinence time, body mass index, caffeine and alcohol intake and smoking. In the multivariate-adjusted analyses, men in the highest category of soy food intake had 41 million sperm/ml less than men who did not consume soy foods (95% confidence interval 5–74, –8; P, trend 5 0.02). Results for individual soy isoflavones were similar to the results for soy foods and were strongest for glycitein, but did not reach statistical significance. The inverse relation between soy food intake and sperm concentration
was more pronounced in the high end of the distribution (90th and 75th percentile) and among overweight or obese men. Soy food and soy isoflavone intake were unrelated to sperm motility, sperm morphology or ejaculate volume. CONCLUSIONS: These data suggest that higher intake of soy foods and soy isoflavones is associated with lower sperm concentration.

Keywords: soy; isoflavones; semen analysis; sperm concentration; infertility

Introduction
Xenoestrogens have been suggested to play a role in a variety of male reproductive disorders including possible declines in sperm concentration (Sharpe, 2001; Skakkebaek et al., 2001). Isoflavones are plant-derived polyphenolic compounds with estrogenic activity and are found mainly in soy beans and soy-derived products. They are generally considered to have a weak estrogenic activity, being able to bind estrogen receptor (ER) a with an affinity 100–1000 times lower than estradiol (Miksicek, 1994; Kuiper et al., 1998; Song et al., 1999; Matthews et al., 2000; Branham et al., 2002; Harris et al., 2002). Nevertheless, isoflavones have also been found to bind strongly to membrane ERs (Thomas and Dong, 2006) and to exert non-genomic actions potentially deleterious to male fertility (Fraser et al., 2006). In addition, isoflavones have been related to male reproductive disorders in mammals, including impaired development of reproductive organs, especially following intrauterine exposure (Atanassova et al., 2000). Data on humans are scarce, however, and often inconsistent with the preponderance of animal data. Thus, whether consuming soy foods during adulthood could affect fertility in men is still an unresolved question. Here, we present a cross-sectional analysis relating soy food and isoflavone intake to semen quality parameters among men presenting for semen analysis at an infertility clinic in an academic medical center.

Materials and Methods
Male partners in subfertile couples who presented for evaluation at the Massachusetts General Hospital Fertility Center between 2000 and 2006 were invited to participate in an ongoing study of environmental factors and fertility (Hauser et al., 2006). Approximately 60% of eligible men agreed to participate. Men presenting for post-vasectomy semen analysis were not invited to participate. The study was approved by the Human Subject Committees of the Harvard School of Public Health and the Massachusetts General Hospital, and informed consent was obtained from all participants.

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Study links folate with healthier sperm

20/03/2008 - A new study has identified a possible link between men's intake of folate and reduced chromosomal abnormalities in sperm - a finding that, if substantiated by more research, may indicate that men should up their intake before conception as well as women.

Although the link between a woman's intake of folate and healthy foetal development has long been known (folate greatly reduces the risk of neural tube defects like spina bifida), the study, published today in the journal Human Reproduction, is claimed to be the first indication that paternal diet may play a role after conception.

Aneuploidy is the general term given to changes in the number of chromosomes. It is estimated that between 1 and 4 per cent of a healthy man's sperm have some form of aneuploidy.

Aneuploidy has been implicated in failure to conceive and miscarriages, as well as children born with conditions such as Down's syndrome, Turner's syndrome and Klinefelter's syndrome.

The study involved 89 healthy, non-smoking men who gave sperm samples and were questioned about their total intake of the nutrients zinc, folate, vitamin C, vitamin E and beta-carotene - both from food sources (such as green leafy vegetables, fruit and pulses) and from dietary supplements (folic acid, the synthetic form of the vitamin).

The researchers found that there was a statistically significant association between high folate intake and lower sperm aneuploidy.

Men in the upper 25th percentile, who had the highest folate intake of between 772 and 1150 micrograms per day, were seen to 20 to 30 per cent less sperm aneuploidy than those with the lowest folate intake.

Despite this association, Professor Brenda Eskenazi, one of the researchers from the University of California, was somewhat cautious about how the study be interpreted.

"This study cannot prove that high folate intake caused the lower sperm aneuploidy levels, only that there is an association," she said. "This is the first
study of its kind and the results indicate the need for further research, especially a randomised controlled trial, on this topic."

The researchers admitted that one of the difficulties of the study was being able to disentangle the effects of folate from other micronutrients. However, they said they were able to do this through statistical analyses of several different nutrients.

The results of these different analyses were different, which they said gave them confidence that they could look at the effect of the micronutrients separately.

Again, however, any doubt over this could be cleared up with a randomised controlled trial using supplements.

The mandatory addition to folic acid to certain foodstuffs, such as bread, has been a hot topic for debate for a number of years.

The US and Canada made the addition of the vitamin to bread mandatory in 1998 in order to reduce the number of pregnancies affected by neural tube defects. The UK, Ireland, and Australia have all meet considering the same action for some time, but it has proved controversial for a number of reasons.

For example, consumer groups say it would severely restrict consumer choice, and believe it should be down to the consumer what they chose to consume. In elderly people with a certain form of anaemia, taking folic acid may mask other deficiencies, thus standing in the way of appropriate intervention.

In addition, emerging science has suggested that folate intake may be linked to an increased risk of colorectal and bowel cancer.

The UK is deferring a decision on mandatory fortification until 2009, pending review of the latest research.

Source

Human Reproduction (advance access)
Doi:10.1093/humrep/den036
"The association of folate, zinc and antioxidant intake with sperm aneuploidy in healthy non-smoking men"
Authors: S S Young, B Eskenazi, FM Marchetti, G Block, and AJ Wyrobek

**TCM treatment of male immune infertility -- a report of 100 cases.**

OBJECTIVE: To observe the therapeutic effect of Yikang Tang (Yikang Decoction) for male immune infertility.
METHODS: 100 cases of male immune infertility in the treatment group were treated with Yikang Decoction, while 100 cases treated with prednisone as the controls. Physical exam, routine semen and prostate exams, and exams for presence of anti-sperm antibody (AsAb) and mycoplasma in the serum or seminal plasma were carried out. RESULTS: 1) The serum and seminal plasma AsAb levels decreased significantly (P < 0.01) in both the groups after treatment, with a more remarkable effect in the treatment group. 2) The sperm density and percentage of motile sperms increased significantly in the two groups, but more significantly in the treatment group after treatment. The pregnancy rate of their wives was higher in the treatment group than that in the control group (P < 0.01). 3) The sperm agglutination rate in the two groups decreased, but more significantly in the treatment group after treatment. 4) The improvement rate of the symptoms and the stability of the therapeutic effect were more dramatic in the treatment group than that in the control group (P < 0.01) after termination of drug administration.

CONCLUSION: The Yikang Decoction has a more stable effect for male immune infertility than prednisone.


A substance isolated from Cornus officinalis enhances the motility of human sperm

The effects of a Chinese herb, Cornus officinalis, on the motility of human sperm was studied. An aqueous extract was prepared from the dried fruits of the herb and used in this study. The crude extract at a final concentration of 0.5 microgram/microliter in phosphate buffered saline (pH 7.4) increased sperm motility from 25.8 +/- 7.7% to 42.8 +/- 10.3% (i.e. 68% increase, n = 7), as determined by the computer-aided-sperm-analysis (CASA) method. The crude extract was fractionated by high-performance liquid chromatography (HPLC) into four fractions: C1, C2, C3 and C4. Their effects on sperm motility were further studied by CASA. Only the C4 fraction showed substantial stimulatory effects on sperm motility. At a concentration of 5 ng/microliter, C4 increased the sperm motility from 15.7 +/- 3.8% to 34.5 +/- 6.4% (i.e. 120% increase, n = 6) by CASA and from 14.9 +/- 4.3 to 28.5 +/- 8.1 (i.e. 91% increase, n = 8) by transmembrane migration ratio (TMMR) method. This result suggests that C4 is the active component in Cornus officinalis that enhances sperm motility.

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Acupuncture boosts sperm quality in infertile men

Researchers demonstrate a significant improvement in specific aspects of sperm quality following a period of acupuncture use.

Acupuncture appears to be a simple method for improving the ultrastructure, and therefore quality, of sperm in men with unexplained infertility, research indicates.

"The treatment of idiopathic infertility could benefit from employing acupuncture," states the team, led by Jian Pei from Shanghai University of Traditional Chinese Medicine in the People's Republic of China.

Acupuncture for men undergoing assisted reproductive technology (ART) has already been shown to have positive effects on sperm quality, fertilization rates, and pregnancy rates.

To evaluate its effects on sperm structure in detail, the researchers used transmission electron microscopy to study ejaculates from 40 men with unexplained infertility, 28 of whom received acupuncture twice a week for 5 weeks.

After acupuncture, a statistically significant increase in the percentage and number of sperm in the total ejaculate without ultrastructural defects was observed, in comparison with controls, with improvements in the shape of the acrosome and nucleus. No change in specific pathologies, such as apoptosis, necrosis, or immaturity, however, was apparent.

Encouraged by these results, Pei et al recommend: "In conjunction with ART or even for reaching natural fertility potential, acupuncture treatment is a simple, noninvasive method that can improve sperm quality."

Source: Fertility and Sterility 2005; 84: 141-7