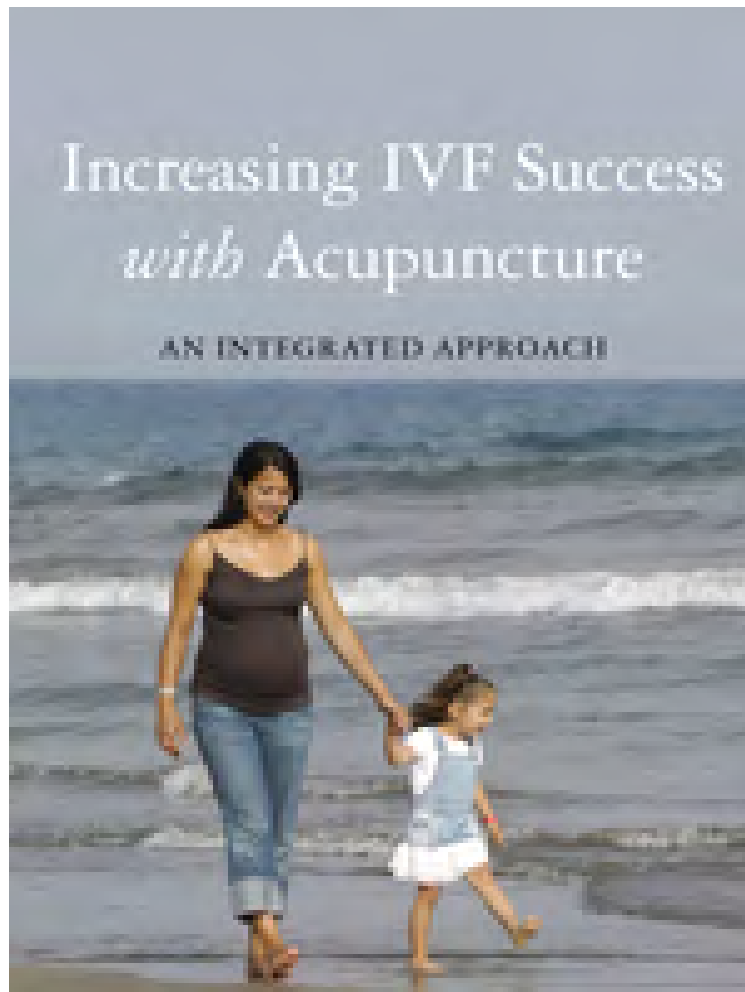




Dalton-Brewer

Increasing IVF Success with Acupuncture



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by naturmed Fachbuchvertrieb

Aidenbachstr. 78, 81379 München

Tel.: + 49 89 7499-156, Fax: + 49 89 7499-157

Email: info@naturmed.de, Web: <http://www.naturmed.de>

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What to include in a diagnosis

An integrated diagnosis will include both traditional medical (TM) and Western medical (WM) categories. Whereas WM colleagues may not derive much from TM terms, traditional medical practitioners can derive a lot from WM diagnostic terms and investigations. Such a diagnosis may take some time.

A full description of the main complaint is required in both TM and WM terms. The diagnosis will look at a patient's personal history: age, children, any complications during previous pregnancies and/or birth, miscarriages, length of time since contraception was stopped, length of time trying to conceive. It's also important to discuss sexual intercourse.

The physiological history should consider a systems review, family history, a gynaecological review and a review of any medication, current or past. It's also useful to include a general checklist of the patient's past examinations, internal investigations and bloods, and a gynaecological/fertility checklist of examinations. The review should also include the body mass index (BMI) and the waist to hip ratio (WHR).

The body mass index

The body mass index (BMI) was devised by the Belgian polymath, Adolphe Quetelet in the middle of the nineteenth century. The measure is worked out by dividing the mass of the individual by the square of their height and is usually expressed as kg/m^2 .

$$\text{BMI} = \text{mass (kg)} / [\text{height (m)}]^2$$

The BMI provides the following indications:

- underweight = <18.5
- normal weight = $18.5\text{--}24.9$
- overweight = $25\text{--}29.9$
- obesity = 30 or greater
- morbid obesity = 40 or greater.

Exogenous antioxidants

Vitamin C

Vitamin C is a very important antioxidant to have in your health chest. The Nobel Prize winner Linus Pauling advocated massive doses of vitamin C administered every day. This vitamin, ascorbic acid, is a preventative compound, inhibiting the damage caused by free radicals, such as degeneration of lipids (lipid peroxidation).

Lipids are hydrophobic compounds derived from fatty acids. In fact, many commentators consider the term 'lipid' synonymous with 'fatty acid' although international consensus on this term is quite unspecific. Fat, wax and oils are also often referred to as lipids. Vitamin E (tocopherol) is classed as a lipid.

Lipids comprise a long carbon chain which is either saturated or unsaturated. Here, saturation refers to a lipid compound replete with hydrogen, whereas unsaturated fatty acids are not, and due to their structure are able to pick up hydrogen atoms. So, saturation refers to the proportion of hydrogen and carbon; the more hydrogen than carbon, the more saturated the fat is. Saturated fats are usually solid at room temperature.

Unsaturated fat is also differentiated into either polyunsaturated or monounsaturated fat. Olive oil is a monounsaturated fat and has only one double-bonded carbon molecule. The essential fatty acid linoleic acid, found in Omega 6 oil, is a polyunsaturated fat because it has more than one double-bonded carbon in the chain.

ROS are a natural life event, an endogenous by-product of mitochondrial respiration (amongst other causes). Often, the production of ROS outweighs the total antioxidant capacity, leading to oxidative stress. This causes damage to lipids and proteins. An example of the danger is the oxidation of low-density lipoprotein (LDL, also known as bad cholesterol) by ROS (and potentially other biochemicals), which eventually causes atherosclerosis. LDL is derived from very-low-density lipoprotein (vLDL). There appears to be a relationship between polycystic ovarian syndrome and elevated ROS, and women with PCOS appear to be at a much greater risk of increased vLDL levels.^{9, 10}

Other than its antioxidant properties, vitamin C is also an important factor in the creation of collagen, and for hormones. In women, it is abundant in the ovaries, and is also present in

promoter, and docosahexaenoic acid (DHA), thought to be very beneficial for memory and learning.

In addition to fish oils, egg yolks, red meats and offal are high in arachidonic acid. It is beneficial in small doses, but too much is bad for you. In fact, elevated insulin levels seem to cause greater secretion of arachidonic acid. It's worth considering whether there is a correlation between the (assumed) subsequent production and secretion of pro-inflammatory molecules such as prostaglandins and the pre-proinflammator ratio of elevated insulin. What is quite interesting is that prostaglandins have a significantly pronounced presence in endometriosis.

In terms of diet, the ratio of arachidonic acid to other foods is really important. We know that weight appears to be significantly involved in successful fertility attempts and often people will be following a particular diet. Some diets advocate an absolute carbohydrate restriction, whereas others recommend high chicken or turkey or salmon diets, with significant carbohydrate restriction. As you may know, chicken and turkey (and even farmed salmon since in many cases the salmon have been fed corn) have a much higher ratio of arachidonic acid to protein than even beef.

Pharmaceuticals

Statins, used to treat arteriosclerosis, increase arachidonic acid, leading to cellular inflammation, which in turn increases resistance to insulin.

NSAIDS are essentially COX inhibitors. So, whilst cyclooxygenase is inhibited and therefore production of inflammators such as prostaglandins is also restricted, the total arachidonic acid count remains unchanged.

Supplements and foods that will restrict the damage done by consumption of arachidonic acid include monounsaturated fats derived from fish oils.

Selenium (Se)

Selenium is a potent antioxidant with wide-ranging effects on cellular function. Selenium is also the component of most of the forms of the antioxidant glutathione (GSH). This antioxidant is

Evidence

Placebo, Evidence, Narrative

It is important to distinguish the very respectable, conscious use of placebos. The effect of placebos has been shown by randomised controlled trials to be very large. Their use in the correct place is to be encouraged. What is inefficient is the use of relatively expensive drugs as placebos.¹

The use of the word 'placebo' in medicine most likely derives from one of the Psalms (originally Psalm 116) from the Catholic ritual, the Office of the Vespers of the Dead.

It is known that the Office of the Vespers of the Dead acquired its current form during the eighth century (at the behest of Pope Gregory III²) but originates at the very least from the seventh century. As in later centuries it was sung at funerals on behalf of a particular soul, and from 735 on All Souls' Day on behalf of all souls in purgatory.

The origins of the word placebo in the Office of Vespers of the Dead, however, is derived from St Jerome's translation of the Bible into Latin during the fourth century. The Hebrew word 'ethalech', meaning 'I will walk with' or 'be in step with', was replaced with the Latin word 'placebo', meaning 'I shall please'.

The modern concept of 'placebo' probably involves the phenomenon of 'placebo singers' whose origins are derived mostly from France in the Middle Ages. It was the custom for wealthy families to provide feasts in honour of their departed. Placebo singers, people either distantly related or entirely unrelated to the family, would attend the funerals to partake of the largesse, and

worth considering when discussing treatment options. Drop-out rates appear to be reduced by changing the type of IVF cycle, that is, by choosing mild IVF (mild ovarian hyperstimulation) along with single embryo transfer. In one study the association between baseline anxiety and drop-out rate was reduced by more than 50 per cent when patients chose mild IVF.⁵

On their website, the American Society for Reproductive Medicine (ASRM) acknowledges that IVF stressors are multifaceted and provides advice on some of the challenges a couple might expect when starting down the IVF route.⁶ As long ago as 1987, patients reported a feeling of loss of control as a result of IVF treatment.⁷ The number reported at that time was 77 per cent.

Treatment of IVF patients with acupuncture

There is a difference between acupuncture for egg collection and embryo transfer, and acupuncture treatments during pre-egg collection time. The reason for this is that treatment for egg collection and embryo transfer acupuncture are acute, and often use point prescriptions, whereas the time preceding egg collection relates more to chronic conditions and point prescriptions will therefore be unique.

TCM is a very effective system for the treatment of fertility. Its methods and techniques are pragmatic and flexible, originating in antiquity and consistently evolving over centuries, selecting, discarding and developing in a manner very similar to the quality management methods of today; review, action and review. Since those early times the most recent innovation is the integration of TCM with Western conventional medicine. The two systems have much to offer each other.

It may be that patients enter your clinic at the beginning of the fertility journey. Even six months prior to IVF can be beneficial for a patient. Generally however, patients arrive at the clinic after they've started their fertility treatment. So the time available to effect change in their presenting condition(s) is limited by the amount of time prior to egg collection, which may be up to six weeks, and is usually much less. Treatment options are therefore limited. Even within those limitations, however, there is a lot that acupuncture treatments can help with. If the cycle is successful, then that's great!

is often applied, but with an eye to contraindications and the stage of the cycle it can be a difficult adjunct to incorporate.

Egg collection

Egg collection involves sedation and painkillers prior to the usual method of retrieval, using a transvaginal ultrasound. The probe is inserted through the vagina and is used to identify the follicles that have reached maturity. Each follicle is pierced by a thin needle (inserted through an ultrasound guide) and the follicular fluid (which contains the egg) is drawn out using a suction device called an aspirator. The entire operation can take less than an hour and recovery is usually 24 to 48 hours.

Another method of egg collection, which may be used if the ovaries are difficult to reach via transvaginal ultrasound, is a laparoscopy, where a laparoscope, a thin probe, is passed through the abdomen to guide the needle.

SIDE EFFECTS OF EGG COLLECTION

Patients often report some side effects of the egg collection. Usually these are mild and include cramping, abdominal bloating, nausea, dizziness and dull pain. Sometimes there may be spotting and shortness of breath.

Acupuncture treatments for egg collection

In 1999 a Swedish research team published a trial evaluating the use of analgesic acupuncture in comparison to a group who used the anaesthetic alfentanil. Both groups received a paracervical block (PCB). The trial was a success insofar as patient recovery was quick, with less nausea, pain and stress than the anaesthetic group, and although unlooked for and not one of the primary goals, there was an increase in pregnancy rates. The majority of patients stated they would use the method again.¹²

In 2003 the Swedish group published the results of a larger and multi-centre trial. The parameters were the same but for the added evaluation of neuropeptide γ (NPY) in follicular fluid and an assessment of pregnancy outcomes. All patients received a PCB; the EA (electro-auricular acupuncture) group received EA and PCB,

Acupuncture for embryo transfer

The first large randomised controlled trial evaluating use of acupuncture for embryo transfer was Paulus *et al.* 2002.¹⁵ This trial investigated the use of two point prescriptions on 80 patients at the time of their embryo transfer (ET); a pre-ET treatment was provided immediately before the ET, and a post-ET treatment was provided immediately after. The control arm consisted of patients who were having ET and did not receive any acupuncture treatments.

The trial was a great success, for patients, for the acupuncture profession and for IVF clinics. The control arm had a 26 per cent clinical pregnancy rate, whilst the intervention arm showed a 42 per cent clinical pregnancy rate.

This initial trial precipitated a rash of further trials, some with different point prescriptions, some with the same point prescriptions, and some trials with different treatment strategies, enough trials for meta-analyses to begin assessing the direction of the data and provide guidance to clinicians on the best advice to provide patients. Early meta-analyses found that overall the provision of acupuncture treatments immediately before and after ET did indeed increase the chances of clinical pregnancy.

Using a point prescription very similar to that used in the Paulus *et al.* trial of 2002, at an IVF centre we also found that the acupuncture treatments significantly improved clinical pregnancies. In 2009 we published a retrospective analysis of 70 patients who received acupuncture treatments before and after ET compared to 70 controls that were matched for age, day of transfer, and transfer type. As with the Paulus trial, this analysis showed a significant increase in successful clinical pregnancy rates in patients having acupuncture before and after transfer. Interestingly, the effect of the acupuncture treatments increased as age increased: in women younger than 35, 26.3 per cent had a clinical pregnancy in the normal IVF group, whereas in the IVF plus acupuncture group the clinical pregnancy rate was 35 per cent. In the group aged 35 to 39, the clinical pregnancy rate in the normal IVF group was 28.6 per cent whereas the IVF plus acupuncture group saw a clinical pregnancy rate of 39.3 per cent. In women 40 and over, the normal IVF group had a clinical pregnancy rate of 20 per cent,

drugs that inhibit anxiety, and the most common anxiolytics are benzodiazepines, also known as tranquillisers. These include trade names such as Valium, Ativan or Xanax. They are usually fast acting and effectively alleviate panic attacks or other symptoms of acute anxiety, but their effect is temporary, and they have side effects.

The side effects of benzodiazepines are significant. They are addictive, cause nausea, impair thinking and establish a lack of energy. As a result, patients often drop out of treatment. As a temporary relief, the actual cause of the anxiety is not addressed, and so once administration of the drug has ceased the ultimate cause of the anxiety will still need to be addressed. The other problem with pharmaceuticals is that they are pharmacokinetically dynamic, interacting with other drugs. Even for those patients who stay the course of treatment, which can be at least a year, any resolution to the presenting condition, whether anxiety or depression, is relatively short lived.²⁸ Seeking alternatives is imperative.

The immune system is fundamentally involved in fertility. In 2007, a trial evaluated the effect of acupuncture in the treatment of emotional systems thought to be involved in the experience of anxiety, and subsequent immunological changes. The immune response was evaluated in a range of different factors including chemotaxis, phagocytosis and NK.

The trial found that a specific point protocol improved chemotaxis (the process of molecular migration through signalling) of the immune cells. The authors, Arranz *et al.*, state that 'acupuncture treatment of anxiety decreases immune cell adherence, facilitating the migration of cells through the endothelial layer towards the infection focus'.²⁹

In addition to the regulation of leukocyte migration, the increase of ROS in anxious women was also reduced by the acupuncture protocol. This has clear benefits for IVF patients, since increased ROS are known to eventually establish a state of oxidative stress in immune cells, leading to compromised chemotaxis and membrane fluidity.^{30,31} ROS are implicated in follicular development, embryo development and the uterine environment.

All immune parameters, whether they were impaired and reduced, or elevated and hyperactive, were brought to parameters similar to or equal to those of healthy controls. The regulatory effect began immediately after the first treatment, and was noticeable after

Dietary supplementation

ROS are a natural result of cellular metabolism. They are also important signalling molecules and support homeostasis when in balance. When out of balance, however, they can become toxic. The states that cause imbalance include stress and heat. Keeping ROS in balance can be managed by dietary supplementation of vitamins and the right foods. If there is a systemic cause, such as liver constraint (as a result of stress, sub-fertility or anxiety/depression for instance), it would be best if acupuncture were provided in addition to dietary supplementation.

Vitamins

The term 'vitamin' is derived from the words 'vital amine' and coined by the Polish-American biochemist Caismir Funk in 1912. Mr Funk learned that people who eat brown rice are less likely to develop the nutritional disease beriberi (*beri* is Sinhalese and means 'weak' – its repetition is to emphasise just how weak a person becomes who is suffering from this nutritional deficiency). His attempt to isolate the core compound (thiamine) led to his isolation of niacin (vitamin B3) and his concept of vital amines.

VITAMIN A

Chemical name: All-trans-Retinol (atROH)

Food source: Liver, dairy, saltwater fish (herring, sardines, tuna), cod and cod liver oil, carrots, corn, dark leafy greens, yellow squash, polar bear liver.

RDA: For women (non-lactating), 770mcg.¹ Five servings of fruit and vegetables will provide roughly 50 per cent of the RDA. Vitamins A, D, and E have been found to interact with vitamin K in some circumstances. Please review information on interactions with Vitamin K on page 158.

VITAMIN B6

Chemical name: Pyridoxal phosphate (active component)

Food source: Main dietary sources include fish, particularly salmon and tuna (yellowfin), organ meats, liver (beef), turkey, chicken (breast), starchy vegetables. Other sources include cottage cheese,

This practical book provides need-to-know specialist knowledge and technical information vital for acupuncturists to treat the increasing numbers of patients with fertility problems.

Nick Dalton-Brewer covers the causes of fertility issues, including the impact of lifestyle and diet, and explains the scientific basis for the different methods of treatment. Integrating assisted reproduction technologies (ART) with traditional Chinese medicine (TCM) therapies and acupuncture, he also presents leading research on the successful use of these therapies to improve fertility and pregnancy rates and describes a method for integrated diagnosis and treatment.

'IVF is a bewildering, complex process. It places extreme intellectual and emotional demands on its patients. This clearly written and comprehensive book demystifies the process without losing necessary detail.'

— *George Cooper, IVF acupuncturist and author of Be Your Own Nutritionist*

'After treatment from Nick Dalton-Brewer with herbs and acupuncture, I had a joyous success on my second cycle of IVF. This book condenses Nick's many years' experience of TCM into a very readable format that will inform clinicians as well as those seeking help having a baby.'

— *Suzy Robinson, happy mother, London*

Nick Dalton-Brewer, MSc, Lic Ac, PG Dip CHM, PG Dip Gynae, MBAcC, MRSMB is a TCM practitioner, specialising in IVF. He trained in acupuncture and Chinese medicine for six years and undertook a further two years of TCM obstetrics and gynaecology training. He is currently engaged in research evaluating the effect of acupuncture on IVF at the Assisted Conception Unit, King's College NHS Foundation Trust, London, UK.



SINGING
DRAGON

73 Collier Street
London N1 9BE, UK

400 Market Street, Suite 400
Philadelphia, PA 19106, USA

www.singingdragon.com

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