

ACUPUNCTURE AND TYPE-2 DIABETES

About type-2 diabetes

Type-2 diabetes (adult-onset or non-insulin-dependent diabetes) is a common metabolic disorder in which the body is unable to regulate the amount of glucose in the blood. The condition affects nearly 1.5 million people in the UK (Diabetes UK, 2004), and may be undiagnosed in as many as a million more. It develops when insufficient insulin is produced by the body, or when the body's cells no longer respond to insulin (insulin resistance).

The four common symptoms of type-2 diabetes are: excessive thirst, passing large amounts of urine, tiredness and weight loss. Over time, the high blood sugar levels caused by type-2 diabetes causes damage to blood vessels. This leads to atheroma, which can cause problems such as poor circulation, angina, heart attacks and stroke. It can result in diabetic complications, including eye disorders, nerve damage, foot problems, kidney disease and impotence.

The cause of type-2 diabetes is complex, involving an interplay of genes and environmental factors. It tends to occur in people over 40 and is strongly associated with being overweight. Weight loss (plus increased physical activity) is more effective than drug therapy for preventing or delaying the development of type-2 diabetes (Knowler 2002). Stress hormones such as cortisol cause blood glucose to rise and promote insulin resistance (Purnell 2009). Stress may play a role in the development of the metabolic syndrome (Rosmond 2005), which often precedes diabetes, as well as increasing the risk of developing type-2 diabetes itself (Eriksson et al, 2008), and that it can increase the severity of the condition (Oltmans 2006). Depression may contribute to developing the condition (Carnethon 2007).

References

Carnethon MR et al. Longitudinal association between depressive symptoms and incident type 2 diabetes mellitus in older adults: the cardiovascular health study. Arch Intern Med. 2007 Apr 23;167(8):802-7.

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Eriksson AK et al. Psychological distress and risk of pre-diabetes and Type 2 diabetes in a prospective study of Swedish middle-aged men and women. Diabet Med. 2008 Jul;25(7):834-42.

Knowler WC et al. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002 Feb 7;346(6):393-403.

Oltmanns KM et al. Cortisol correlates with metabolic disturbances in a population study of type 2 diabetic patients. *Eur J Endocrinol*. 2006 Feb;154(2):325-31.

Purnell JQ et al. Enhanced cortisol production rates, free cortisol, and 11beta-HSD-1 expression correlate with visceral fat and insulin resistance in men: effect of weight loss. *Am J Physiol Endocrinol Metab*. 2009 Feb;296(2):E351-7.

Rosmond R. Role of stress in the pathogenesis of the metabolic syndrome. *Psychoneuroendocrinology*. 2005 Jan;30(1):1-10.

How acupuncture can help

Chinese medical texts have recognized diabetes as “wasting-thirsting” for thousands of years, relating it to the consumption of too much rich food. Acupuncture therapy is a common approach to treating diabetes in modern China. However, research is scarce and randomized controlled trials almost non-existent. Most clinical studies have focused on peripheral neuropathy, where there is preliminary evidence for an effect (Jiang 2006; Abuaisha 1998). It may help to treat obesity (Cho 2009), which is the primary risk factor for developing type-2 diabetes, and also depression (see BAcC Fact Sheet “Acupuncture and Depression”).

Studies on physiological mechanisms, both with humans and laboratory animals, indicate that acupuncture may:

- regulate insulin production (Lin et al, 2004) and blood sugar levels (Lin 2004; Chang 2006; Cabioklu 2006; Jiang 2006)
- improve the blood lipid profile (Cabioklu 2005; Jiang 2006) (dyslipidaemia is common in patients with type-2 diabetes and may lead to cardiovascular morbidity and mortality).
- improve blood circulation (Tsuchiya 2007), thus helping to slow the onset and progression of diabetic circulatory complications
- moderate the stress response (Sakai 2007)

Most people use acupuncture as part of an integrated diabetes treatment plan because they are already using Western medication. Acupuncture can be safely and effectively combined with Western biomedicine and other treatments such as relaxation exercises and herbal medicine. In addition to offering acupuncture and related therapies, acupuncturists will often make suggestions as to dietary and other lifestyle changes that may be beneficial. Eating a healthy balanced diet, taking regular physical exercise, reducing stress and maintaining a healthy body weight can help to prevent or delay the onset of type-2 diabetes and slow the progression of the disease. Working with a supportive therapist can help people commit to these positive lifestyle changes.

Full details of research studies into traditional acupuncture treatment for diabetes can be found overleaf.

About traditional acupuncture

Acupuncture is a tried and tested system of traditional medicine, which has been used in China and other eastern cultures for thousands of years to restore, promote and maintain good health. Its benefits are now widely acknowledged all over the world and in the past decade traditional acupuncture has begun to feature more prominently in mainstream healthcare in the UK.

Traditional acupuncture takes a holistic approach to health and regards illness as a sign that the body is out of balance. The exact pattern and degree of imbalance is unique to each individual. The traditional acupuncturist's skill lies in identifying the precise nature of the underlying disharmony and selecting the most effective treatment.

The World Health Organisation (WHO) recognises that acupuncture can help resolve specific symptoms or conditions. Traditional acupuncture can also be used as a preventive measure to strengthen the constitution and promote general wellbeing.

An increasing weight of evidence from Western scientific research (see overleaf) is demonstrating the effectiveness of acupuncture for treating a wide variety of conditions and revealing the mechanisms by which it acts. From a biomedical viewpoint, acupuncture is believed to stimulate the nervous system, influencing the production of the body's communication substances - hormones and neurotransmitters. The resulting biochemical changes encourage the process of homeostasis, activating the body's self-regulating systems, thus stimulating its natural healing abilities and promoting physical and emotional wellbeing.

About the British Acupuncture Council

With over 3000 members, the British Acupuncture Council (BAcC) is the UK's largest professional body for traditional acupuncturists. Membership of the BAcC guarantees excellence in training, safe practice and professional conduct. To find a qualified traditional acupuncturist, contact the BAcC on 020 8735 0400 or visit www.acupuncture.org.uk

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The evidence

Research	Conclusion
Reviews	
Cho SH et al. Acupuncture for obesity: a systematic review and meta-analysis. <i>Int J Obes (Lond)</i> . 2009 Feb;33(2):183-96.	Systematic review of studies of acupuncture for treating obesity. Analysed pooled results from 31 studies involving 3013 cases. Concludes that acupuncture is an effective treatment for obesity.
Clinical trials	
Jiang H et al. Clinical study on the wrist-ankle acupuncture treatment for 30 cases of diabetic peripheral neuritis. <i>J Tradit Chin Med</i> . 2006 Mar;26(1):8-12.	Randomized controlled trial of acupuncture for peripheral diabetic neuropathy. 90 patients were treated with either wrist-ankle acupuncture, whole-body acupuncture, or conventional medical treatment. Both acupuncture groups experienced significantly better results than the conventional medical/control group. Acupuncture was also observed to improve blood sugar and lipid metabolism, and restore the functions of peripheral nerve cells
Cabioklu MT, Ergene N. Changes in levels of serum insulin, C-Peptide and glucose after electroacupuncture and diet therapy in obese women. <i>Am J Chin Med</i> . 2006;34(3):367-76.	Randomized controlled trial of acupuncture investigating the effects of electroacupuncture (EA) combined with diet on body weight and levels of serum insulin, c-peptide and glucose in obese women. Found that (compared with sham EA+diet), EA+diet was effective in treating obesity and that EA decreased serum glucose levels by increasing serum insulin and c-peptide levels.
Abuaisha BB et al. Acupuncture for the treatment of chronic painful peripheral diabetic neuropathy: a long-term study. <i>Diabetes Res Clin Pract</i> . 1998 Feb;39(2):115-21.	Observational study of acupuncture for peripheral diabetic neuropathy. 46 patients were treated with classical acupuncture over a period of 10 weeks and followed up for up to one year. 77% showed significant improvement in their symptoms with 7 reporting complete elimination of symptoms. 67% of patients who used medications at the start of the study were able to stop or reduce their medications significantly during the follow-up period.
Physiological studies	
Sakai S et al. Specific acupuncture sensation correlates with EEGs and autonomic changes in human subjects. <i>Auton Neurosci</i> . 2007 May 30;133(2):158-69.	Experimental study of the effects of acupuncture on the autonomic nervous system in healthy volunteers. Found that acupuncture inhibited activity of the sympathetic nervous system (responsible for the fight or flight/stress response).
Tsuchiya M et al. Acupuncture enhances generation of nitric oxide and increases local circulation. <i>Anesth Analg</i> . 2007 Feb;104(2):301-7.	Randomized controlled trial studying the effects of acupuncture on local blood circulation. 20 volunteers underwent a session each of real and sham acupuncture in a single hand and forearm with a 1-wk interval between treatments. Concentration of nitric oxide (NO - a vasodilator) in the plasma from the acupunctured arm was significantly increased. Blood flow in the hand of the acupunctured arm also increased. No changes were observed with sham. Concluded that acupuncture increases the NO level in treated regions and thereby increases local circulation.
Chang SL et al. Enhanced insulin sensitivity using electroacupuncture on bilateral Zusanli acupoints (ST 36) in rats. <i>Life Sci</i> . 2006 Aug 1;79(10):967-71.	Experimental study of the effect of electroacupuncture (EA) on blood glucose and insulin levels in diabetic rats. Found that EA had hypoglycaemic activity and improved glucose tolerance.
Cabioklu MT, Ergene N. Electroacupuncture therapy for weight loss reduces serum total cholesterol, triglycerides, and LDL cholesterol levels in obese women. <i>Am J Chin Med</i> . 2005;33(4):525-33.	Randomized controlled trial of acupuncture investigating the effects of electroacupuncture (EA) on serum lipid profile in obese women. Found that decreased total cholesterol, triglyceride, and LDL cholesterol levels by increasing the serum beta endorphin level. Concluded that the lipolytic effect of EA may also reduce the morbidity of obesity by mobilizing the energy stores that result in

	weight reduction.
Lin JG et al. Multiple sources of endogenous opioid peptide involved in the hypoglycemic response to 15 Hz electroacupuncture at the Zhongwan acupoint in rats. Neurosci Lett. 2004 Aug 5;366(1):39-42.	Experimental study investigating the the hypoglycemic response to electroacupuncture (EA) in rats. Concludes that EA causes an increase in beta-endorphin production by the adrenal gland, which enhances the secretion of insulin, thereby reducing plasma glucose levels.

Terms and conditions

The use of this fact sheet is for the use of British Acupuncture Council members and is subject to the strict conditions imposed by the British Acupuncture Council details of which can be found in the members area of itsö website www.acupuncture.org.uk.