

## Comparative evaluation of the therapeutic effect of metformin monotherapy with metformin and acupuncture combined therapy on weight loss and insulin sensitivity in diabetic patients

Amir Firouzjaei, Guo-Chun Li, Ning Wang, Wan-Xin Liu and Bing-Mei Zhu

Nanjing University of Chinese Medicine, China

**Objective:** Obesity induces insulin resistance (IR), the key etiologic defect of type 2 diabetes mellitus (T2DM). Therefore, an incidence of obesity-induced diabetes is expected to decrease if obesity is controlled. Although, metformin is currently one of the main treatment options for T2DM in obese patients, resulting in an average of 5% weight loss, adequate weight control in all patients cannot be achieved with metformin alone. Thus, additional therapies with a weight loss effect, such as acupuncture, may improve the effectiveness of metformin.

**Subjective:** We designed this randomized clinical trial (RCT) to compare the effects of metformin monotherapy with that of metformin and acupuncture combined therapy on weight loss and insulin sensitivity among overweight/obese type 2 diabetes (T2DM) patients, to understand whether acupuncture plus metformin is a better approach than metformin only on treating diabetes and to understand whether acupuncture can be an insulin-sensitizer and, if so, its therapeutic mechanism.

**Results:** Our results show that metformin and acupuncture combined therapy significantly improves body weight,

body mass index (BMI), fasting blood sugar (FBS), fasting insulin (FINS), homeostasis model assessment index (HOMA), interleukin-6 (IL-6), tumour necrosis factor- $\alpha$  (TNF- $\alpha$ ), leptin, adiponectin, glucagon-like peptide-1 (GLP-1), resistin, serotonin, free fatty acids (FFAs), triglyceride (TG), low density lipoprotein cholesterol (LDLC), high density lipoprotein cholesterol (HDL), and ceramides.

**Conclusion:** Consequently, metformin and acupuncture combined therapy is more effective than Metformin only, proving that acupuncture is an insulin-sensitizer and can improve insulin sensitivity possibly by reducing body weight and inflammation, while improving lipid metabolism and adipokines. Thus, electro-acupuncture (EA) might be useful in controlling the ongoing epidemics in obesity and T2DM.

### Biography

Amir Firouzjaei is currently working as a Dean of Acupuncture Department at Pardis multiple pain clinic, Acupuncturist, Tehran, Iran. He completed his Clinical PhD in Chinese Medicine, Acupuncture and Moxibustion specialty, Nanjing at the University of Chinese Medicine, and Doctorate in Medicine, General Physician Specialty and the thesis is entitled, "Comparative evaluation of the therapeutic effect of Metformin monotherapy with Metformin and acupuncture combined therapy on weight loss and insulin sensitivity in diabetic patients" which is published in May 2016 in Nutrition & Diabetics, Nature Group. His paper, "Development of Acupuncture in Iran" (Academic) was awarded internationally excellent paper at the 10th World Congress of Chinese Medicine in Sep 2013, Santa Clara, California, USA. He is a Coordinator of IRSES Marie Curie project on "China and Europe taking care of health care solution, CHETCH", Jan- Dec 2015, an International Consultant and Member of Iranian Scientific Acupuncture, member of World Federation of Chinese Medicine Societies (WFCMS) and Licensed Member of The Islamic Republic of Iran Medical Council.

amirfi@yahoo.com

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