

Herbal Medicine and Sexual Behavior in Diabetic Patients

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Sexual dysfunction causes negative feelings such as fear of failure or shame and loss of an erotic world in relation to male sexuality (1). Depression, interpersonal and sociocultural factors, life stresses, and anxiety play a significant role in reducing sexual desire and as a consequence increased infertility concerns (2).

Diabetes is detected by measurements of high glucose level in the blood. It causes a number of side effects in reproductive organs and related disorders in patients. Many factors such as changes in life style and genes, immune system disorders, low antioxidants, increased reactive oxidative stress (ROS), eradication of pancreatic beta cells by infectious diseases, viruses, overweight, obesity, and physical inactivity are the most common causes of this disease following insulin resistance. Erectile dysfunction (ED) is a condition in which a man is unable to get or keep erection that allows sexual activity for penetration. ED is not a disease per se, but is the symptom of some problems. Low libido is another symptom of diabetes which is recognized by low testosterone levels. Testosterone as a male sex hormone is the most important androgen that is needed for a normal sexual life and reproduction. About 30% of diabetic patients have low serum testosterone and this is often observed in type 2 diabetic patients. Luteinizing hormone (LH) in the brain is needed for the Leydig cells in the testes to make testosterone hormone. The high level of blood glucose causes the low production of LH, so testosterone deficiency occurs in diabetic patients. Androgen deficiency happens in diabetes and decreases the sexual activity.

Nowadays, infertility is regarded as one of the important public health issues because of its prevalence in result of social problems. To find the solution, we have to first basically face the problem. Unfortunately, modernization has significantly affected life patterns. In sedentary but fast-paced lifestyle, many people spend a large part of their time sitting, be it in an office chair or a car seat, for making money with no time to spare for exercise. Due to time constraints, fast foods, snacks, and candy bars are prioritized over home cooked meals and nutritious foods. As a result, overweight, metabolic disorders like type 2 diabetes mellitus which has been linked to infertility, declining semen quality, increasing ROS turn to a global epidemic (3).

Protecting intracellular free radicals may provide a therapeutic strategy to prevent oxidative stress and the related diabetes.

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He currently acts as the research manager for Women's Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran, and acts as the Editor-in-Chief for International Journal of Women's Health and Reproduction Sciences, indexed in ISI and Scopus databases. Dr. Khaki is an active member of American Society of Andrology (ASA) since 2001 and a member of International Society of Gynecological Endocrinology (ISGE). He got awarded by World Health Organization and American Society of Andrology in 2010, Houston Texas, USA, and also got Greenblatt Award in Prague, Czech Republic, in 15th World Congress on Menopause which was held on 28 September, 2016.

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Antioxidants may importantly act at different levels, inhibiting the formation of ROS or scavenging free radicals, or increasing the antioxidants defense enzyme capabilities. In this regard, flavonoids as antioxidant factors are found in a plethora of nutrients including fruits, vegetables, and some medicinal herbs (4). Medicinal herbs have a long tradition of use in conventional medicine. Medicinal plants are less expensive and available for a wide range of societies. The bioactive compounds in plant extracts are highly regarded because they are derived from natural sources and are compatible with vital systems. Researchers proved that herbal plants-mediated treatment has a protective effect on reproductive hormones levels including LH, testosterone, and FSH (5,6). Khaki et al have worked on the features of herbal plants including *Cinnamomum zeylanicum*, *Allium cepa*, *Zingiber officinale*, and rosmarinic acid (RA) which is related to spermatogenesis and female factors, for a decade. In a research carried out on RA, Khaki et al showed that this plant possesses large quantities of polyphenols and strong antioxidants, and shows antimicrobial activities in rats in protecting the cells against damage caused by free radicals. In vitro and in vivo studies have shown that Rosemary extracts increases level of testosterone which in turn increases the sexual desire and total antioxidant capacity (TAC), helping in omitting oxidative stress generated in diabetic rats. It also decreases amount of MDA which causes apoptosis in the sertoli cells (7). This research was competent enough to win a prize in 15th World Congress on Meno-



pause which was held on 28 September, 2016, in Prague, Czech Republic. Following the works of Khaki et al, Akio Iuni proved that RA could improve the glucose homeostasis and insulin resistance, decrease hyperglycemia and ameliorate insulin sensitivity by reducing PEPCK (metabolic pathway of gluconeogenesis) expression in liver and increasing GLUT4 (decreasing hepatic lipid production) expressions in skeletal muscle (8).

As a conclusion, the use of medicinal herbs in general and the habitual use of RA in particular is suggested in lowering the biomarkers of oxidative stress, and increasing the libido, which would result in the treatment of infertility in diabetic patients.

Ethical Issues

Not applicable.

Conflict of Interests

None.

Financial Support

None.

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