• Case Report

Integrative techniques using acupuncture, Chinese herbal medicine, diet, and supplements for polycystic ovary syndrome: a case report

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1 Introduction

Patients with a diagnosis of polycystic ovary syndrome (PCOS) are on the rise. About 4%-12% of women are currently estimated to have this condition[1]. It is hypothesized that PCOS appears in women who have long-standing insulin resistance (IR), which leads to high androgen and testosterone levels; this ultimately disrupts their menstrual cycles[1,2]. Some researchers attribute IR to genetic factors[3], although there have been only minute changes in the human genome in the past 20 000 years[4]. However, even with a stable gene pool, genes can be turned on and off by the environment, food and air quality and toxin exposure[4,5].

Human diets have changed dramatically over the past sixty to seventy years. Farm fresh food has been replaced with factory farming, and home-cooking has been replaced with microwaved TV-dinners, soda pops, donuts, and processed foods — all of which have reduced overall nutrient density[6]. Average grain consumption has increased 45% from the 1970s to year 2000[7]. The United States Department of Agriculture food pyramid and food plate recommends 6-11 servings of carbohydrates per day[8,9]. Carbohydrates act like a sugar in the body. The average sugar consumptions in the US was 2 pounds annually in the 1800s[10]. By 1970 it rose to 123 pounds, and today that number lies at an enormous 152 pounds per year[10]. These numbers only include refined sugars, so if we also include the sugars from other carbohydrates or alcohol, total sugar consumption would be even more staggering! The number of patients with type 2 diabetes between 1983 and 2008 increased sevenfold[4]. In 2011 those numbers have increased to 347 million worldwide[11].

The incidence of PCOS is high in women who have IR. IR can develop when blood glucose rises steeply after consumption of a high carbohydrate or sugary meal several times per day for many years. Each time, the pancreas secretes insulin in order to counteract the high glucose levels and push glucose into cells[12]. Over time, the insulin receptors become resistant to insulin's effects. Males with IR aromatize testosterone into estrogen[13], which can manifest as gynecomastia and excess adipose tissue (apple shape). Women who have IR can develop high testosterone, which results in masculine features such as hirsutism[14-16] and male pattern baldness. Typically, women with PCOS show additional traits such as obesity (though not all women with PCOS are obese), acanthosis nigricans, unripe ovarian follicles that look like cysts, acne, amenorrhea, anovulation, and/or irregular ovulation and menstruation[1,2]. Many patients with PCOS should be evaluated for hypothyroidism and/or Hashimoto's disease[17,18], which are common conditions in this patient population. Diet-induced inflammation is a common factor in patients with PCOS[19].

Common laboratory findings include the following indices: elevated androstenedione, free testosterone, dehydroepiandrosterone sulfate, triglycerides, and an abnormal ratio between luteinizing hormone to follicle-stimulating hormone

(FSH). Ultrasound may show the "string of pearls", or follicles that have undergone atresia[1,2].

Western medical treatments for patients with PCOS include birth control pills to help regulate the menstrual cycle[1,2]. Anti-androgens are also used to suppress the androgenic features. Another treatment for PCOS is the use of metformin (glucophage), which treats IR to some degree[1,2]. Many women who suffer from infertility choose assisted reproductive technologies to stimulate ovulation. However, none of the above treatments address the cause of IR[1,2].

2 Case report

The following case report illustrates integrated therapies of acupuncture, Chinese herbal medicine, nutrition, and functional medicine. A 31-year-old white female patient was first seen in our clinic in the fall of 2010. She presented with infertility (the couple had tried to conceive for five years prior), hair loss, hirsutism, acanthosis nigricans, a small number of unripe follicles visualized on ultrasound, obesity, decreased libido, night sweats, and vaginal dryness. The patient stated that she was menstruating irregularly every 34-50 days; she suffered from irritability and breast distention prior to the onset of her menstrual cycle, which was characterized by a scanty, dark red menstrual flow lasting about 6 d. She had been diagnosed with PCOS in 2006 by her doctor who confirmed polycystic ovaries imaged via ultrasound. This patient met two of three criteria for a diagnosis for polycystic ovarian disease[1]: positive finding of multiple cysts via ultrasound and signs of hyperandrogenism (hirsutism, hair loss, and acanthosis nigricans). She was put on metformin by her doctor in 2007. Unfortunately, she had significant side effects which stopped when she discontinued the medication. Her doctor diagnosed her with hypothyroidism in early 2010 and placed her on thyroid medication. Other complaints included obesity, dizziness, cold hands and feet that were exacerbated at night, rapid heartbeat, allergies, bloating, and decreased appetite. She also suffered from fullness and fatigue after eating, sugar cravings, increased memory loss, poor concentration, mood swings, over-thinking, and anxiety.

Her diet consisted of the following: breakfast: none; lunch: leftovers such as chicken breast, vegetables, bread and cookies; afternoon snack: chocolate, chips or pie; dinner: rice 6× per week, pasta 1× per week, with chicken, turkey, or fish. She used olive and canola oil for cooking oils. She did not consume much red meat.

Her laboratory results from May 2010 show the functional medical[20] not standard Western medical laboratory ranges: hemoglobin A1c 5.6% (<5.7%), thyroid stimulating hormone (TSH) 3.67 mIU/L (1.8-3.0 mIU/L), total thyroxine (TT4) 7.9 μg/dL (6-12 μg/dL), neutrophils 71% (40%-60%), lymphocytes 21% (25%-40%), neutrophils (absolute) $8.4\times10^3/\mu L$ ($(1.8\text{-}7.8)\times10^3/\mu L$), white blood cell (WBC) $11.9\times10^3/\mu L$ ($(5.0\text{-}8.0)\times10^3/\mu L$), triglycerides 115 mg/dL (<100 mg/dL), cholesterol 203 mg/dL (150-200 mg/dL), low-density lipoprotein 130 mg/dL (< 99 mg/dL), high-density lipoprotein 50 mg/dL (>55 mg/dL), vitamin D3 14.7 ng/mL (optimal range ~ 40 ng/mL)[21], gamma-glutamyl transpeptidase 46 IU/L (10-26 IU/L).

Her tongue was pale and slightly swollen; her pulse was slightly thin, and weak.

Her medication/supplement list included levothyroxine, vitamin D3, black cohosh, and prenatal vitamins.

3 Diagnosis and treatment

Her traditional Chinese medicine diagnosis included kidney yang deficiency which was characterized by her cold hands/feet, thyroid disorder, infertility, and weak pulse; kidney yin deficiency which was seen in the night sweats, lowered libido, memory loss, and thin pulse; spleen qi deficiency which was seen in the fatigue, poor appetite, over-thinking, and slightly swollen tongue; blood deficiency which was seen in the dizziness, blurry vision, delayed menses, leg cramps, pale tongue, and thin pulse; liver qi stagnation which was seen in her mood swings and pre-menstrual syndrome (PMS); and finally, phlegm stagnation which was seen on ultrasound showing several unripe follicles and in her obesity.

Her functional medical diagnosis consisted of IR (triglycerides > 100 mg/dL, sugary, carbohydrate-rich diet, fatigue after meals, sugar cravings) coupled with mild reactive hypoglycemia (RHG) (no breakfast) contributing to PCOS. IR and PCOS can lead to systemic inflammation[19,22,23] and stress the adrenals. In addition, she had hypothyroidism, poor acetylcholine firing in the brain and poor peripheral circulation. This may result possibly from sympathetic upregulation from inflammatory processes. It may also result from nutrient deficiency. Dietary sources of L-tyrosine are found in high-protein foods such as eggs, dairy, nuts, avocados, and meat[24]. L-tyrosine is one of several components needed to make T4 in the thyroid gland[25]. A key nutrient needed to form acetylcholine is choline which is primarily found in organ meats and other meats[26,27]. Given her immune marker elevations it was requested that her doctor run thyroid antibodies (thyroid peroxidase and antithyroglobulin antibodies) to rule out Hashimoto's disease.

She was counseled on her diet, particularly on the importance of eating breakfast. Not eating breakfast contributes to starving the brain of much-needed glucose. We discussed the importance of reducing carbohydrates (rice and pasta), removing sugar, soft-drinks, chips, cookies, chocolate, and pie, and increasing whole fat dairy, meats, fish, and poultry, and lots of vegetables and vegetable juices. She was advised to include home-made bone marrow broth and have it