

Metabolic syndrome, hypothyroidism and depression at consultation: a case history

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ABSTRACT

This case report describes a 54-year-old obese woman presenting with metabolic syndrome, hypothyroidism and depression. Her medical history includes conditions of pubertal obesity and polycystic ovary syndrome (PCOS). After 3 months of receiving drug and dietary therapy, the patient achieved reduced body weight and an improvement of laboratory test results. However, further healthcare is required in areas of internal medicine, psychiatry and dietetics.

KEY WORDS: metabolic syndrome, hypothyroidism, depression.

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INTRODUCTION

Clinical studies have indicated a positive correlation between hypothyroidism and a raised body mass index (BMI). Other work has shown that obese people have significantly higher thyroid-stimulating hormone (TSH) levels than normal. Moreover, in obese patients with TSH concentrations in the range 2.5–4.5 mg/dl, a higher prevalence of metabolic syndrome is observed [1]. Furthermore, the occurrence of metabolic syndrome is twice as likely in patients with polycystic ovary syndrome (PCOS) as compared to the general population [2]. Polycystic ovary syndrome is a systemic disease that affects the health in women of all ages. Young women suffer problems of infertility and androgenisation, whilst the long-term effects of metabolic disorders in older women increase the risk of contracting cardiovascular system diseases.

Polycystic ovary syndrome is also associated with an elevated risk of endothelial dysfunction and raised inflammation markers which, with concomitant lipid disorders and hyperinsulinaemia, increase the risk of coronary heart disease. The primary goal in treating PCOS in young infertile women is frequently to reduce the symptoms of hyperandrogenism and afford endometrial protection, followed by inducing ovulation and childbirth. In addition, PCOS treatments include attaching increasing importance to a change in the lifestyle of patients, i.e. by taking physical exercise and eating diets for reducing body weight [3].

CASE REPORT

The female patient (AP) was 54-year-old and was admitted to the Department of Gynaecology for diagnosis of various disorders with symptoms consisting of menopause-related hot flashes, sweating, insomnia and palpitations. As a consequence of having fibroids, heavy

menstrual bleeding and after unsuccessful hormone replacement therapy (HRT) (*System sequi*, then *System conti*), the patient had undergone hysterectomy without appendages when aged 51 years. Her medical history revealed that at puberty she had suffered from menstrual disorders, such as oligomenorrhoea-menarche (when aged 15 years), acne, overweight and hirsutism. Consultations then held had indicated some PCOS symptoms. Unfortunately at that time she was neither diagnosed nor treated. After giving birth to her first son, when aged 25 years, she suffered from postpartum depression requiring psychiatric treatment in subsequent months.

Her second son was delivered vaginally, when she received epidural anaesthesia, and this time there were no symptoms of depression. Nevertheless, the patient remained under psychiatric care.

Symptoms of depression requiring treatment, however, returned during the premenopausal period, which was preceded by a decrease in libido and a depressed/low mood. The patient continued to remain under the care of specialist psychiatrists.

Between the ages of 51 and 54 years, the patient significantly gained weight from 76 kg to 98 kg, and her waistline grew from 96 cm to 165 cm. She also suffered from intensified cardiac arrhythmias, hot flashes and insomnia.

Clinical laboratory testing performed by the Department of Gynaecology gave the following results: blood pressure 140/95, pulse 99, cholesterol and triglycerides respectively 342.5 mg/dl and 174.4 mg/dl; TSH 5.41 μ U/ml, fT3 3.59 pg/ml, fT4 1.18 ng/dl, oestradiol 25.86 pg/ml and PRL 15.58 ng/ml. Fasting glucose was 104.2 mg/dl, after a 75 g glucose load 195 mg/dl, and after 2 hours 163.3 mg/dl. Insulin was respectively 23.74 mU/ml, 265.60 mU/ml and 467.90 mU/ml.

Metabolic syndrome and hypothyroidism were then diagnosed, and she received specialist pharmacological treatment and was put on a special diet. After 3 months of thyroid therapy, the internist found her to be euthyroid and she had lost 4 kg of weight as well as showing improved laboratory test results. The patient, however, required strict health care in areas of internal medicine, mental health and diet.

DISCUSSION

Hypothyroidism and an elevated body weight are related, whilst those persons suffering from obesity are also prone to hypothyroidism, with statistically significantly higher levels of TSH being found [1]. The present case requires investigation of the problems regarding metabolic syndrome and PCOS [2]. In patients with metabolic disorders and endocrinopathies, disorders in mood or libido are commonly observed [4]. The case study patient requires psychiatric treatment, with depression having been diagnosed. Metabolic syndrome is associated with risk factors for cardiovascular disease and

type 2 diabetes. Studies on the aetiopathogenesis of metabolic syndrome are still ongoing. It is certain that account is being taken of interactions between genetic, environmental and aging factors. Unfortunately this syndrome has become increasingly prevalent in the population at large and is a reflection of an abnormal diet, excessive eating and a lack of physical activity. The syndrome is diagnosed on the basis of criteria, operating in parallel, from the International Diabetes Federation (IDF) and modified criteria (in 2005) from the National Cholesterol Education Program Adult Treatment Panel III (ATP III) (5/55). Using the ATP III criteria, it was observed that the prevalence rate of metabolic syndrome in women with PCOS is 43-36% [2]. Polycystic ovary syndrome is in itself an endocrinopathy which occurs in 6-10% of women. A common feature of both syndromes is the fact that one of the principal reasons for their development is considered to be insulin resistance and compensatory hyperinsulinaemia thus arising.

CRITERIA FOR DIAGNOSING METABOLIC SYNDROME

According to IDF criteria, metabolic syndrome is present when abdominal (visceral) obesity occurs as defined by a waist circumference > 80 cm in women, coupled with any two of the following factors:

- raised triglycerides \geq 150 mg/dl or specific treatment for this lipid abnormality;
- reduced high-density lipoprotein (HDL) < 40 mg/dl or specific treatment for this lipid abnormality;
- raised blood pressure: systolic BP \geq 130 or diastolic BP \geq 85 mmHg or treatment of previously diagnosed hypertension;
- raised fasting plasma glucose \geq 100 mg/dl or previously diagnosed type 2 diabetes.

According to ATP III modifications made in 2005, the criteria for diagnosing metabolic disorder now consist of any three of the following:

- abdominal obesity defined as a waist circumference \geq 88 cm;
- fasting blood glucose \geq 100 mg/dl or previously diagnosed diabetes therapy;
- systolic blood pressure \geq 130 mm Hg or diastolic blood pressure \geq 85 mm Hg, or treatment of previously diagnosed hypertension;
- raised triglycerides \geq 150 mg/dl or specific treatment for this lipid abnormality;
- HDL cholesterol < 50 mg/dl or treatment of this disorder [2].

Previous definitions of metabolic syndrome were based on the coexistence of insulin resistance in women with other disease criteria which, based on numerous other studies, include those that are key disorders of PCOS. Insulin resistance is currently considered to be the main feature of metabolic syndrome; PCOS can be considered as a gender-specific metabolic syndrome

(XX syndrome). Insulin resistance is a metabolic condition in which physiological concentrations of insulin are insufficient to fulfil their intended function, i.e. glucose utilization is inadequate in peripheral tissues and inhibiting hepatic glucose formation is ineffective [2]. Producing more insulin thereby compensates for such states, leading to hyperinsulinaemia. The next stage is glucose intolerance type 2 diabetes, initially hyperinsulinaemia and insulinopaenia. Factors that may increase the risk of insulin resistance are increased or reduced body weight at birth, gestational diabetes, family history of type 2 diabetes or the metabolic syndrome. Obesity, chiefly visceral, significantly affects the extent of insulin resistance [2]. Insulin can stimulate thecal ovarian cells to produce testosterone and, if excessive, this leads to hyperandrogenism (insulin-dependent hyperandrogenism). This, when associated with PCOS, may in turn lead to insulin resistance and further metabolic consequences thereof. Both syndromes are associated with obesity.

Increased body fat, especially visceral, is associated with hyperandrogenism, insulin resistance, glucose intolerance and dyslipidaemia. When patients lose weight, insulin resistance becomes corrected, as do metabolic disorders. Weight loss in patients improves insulin resistance and metabolic disorders along with reducing hyperandrogenism, and the spontaneous pregnancy rate is increased to 30% [2]. It should be stressed that changing lifestyle by means of diet and exercise constitutes the basic principle for preventing type 2 diabetes and full-blown metabolic syndrome [4-6]. Weight reduction is also a key component in treating PCOS patients, together with correcting insulin resistance and associated metabolic disorders. In particular, the BMI should be reduced in women with PCOS, primarily by making lifestyle changes [2].

CONCLUSIONS

This patient's case study illustrates the need for making an early diagnosis of PCOS and the metabolic syndrome. At present, the patient still requires interdisciplinary medical care and dietary control.

DISCLOSURE

Authors report no conflict of interest.

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