



Comments and commentaries

Metabolic syndrome: A case report for collaborative care



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ARTICLE INFO

Article history:

Received 11 June 2013

Received in revised form 21 August 2013

Accepted 22 August 2013

Keywords:

Metabolic syndrome

Complementary and alternative medicine (CAM)

Magnesium

Fish oils

Vitamin D

Calcium

Cinnamon

Diet

Glycaemic index

Integrative medicine

ABSTRACT

A 51-year-old female presented with metabolic syndrome. With comprehensive naturopathic care she was able to improve metabolic markers for risk of Type 2 diabetes and cardiovascular disease, though further improvements were necessary. Collaborative care with her general practitioner ensured that appropriate monitoring was maintained to substantiate safety throughout the 12-week treatment plan.

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Presenting complaint

A 51-year-old female presented with osteopenia and weight gain. She had gained in total 15 kg over several years, with 5 kg since the onset of peri-menopause three years prior.

Osteopenia had been diagnosed 4 years prior. Accordingly, her general practitioner (GP) prescribed raloxifene hydrochloride 60 mg daily in addition to a calcium supplement, which provided 250 mg elemental equivalent daily (as hydroxyapatite and citrate) with magnesium 125 mg (as oxide) and vitamin D3 100 IU.

She also reported restless legs at night accompanied by cramps, in addition to burning sensation in both feet exacerbated by prolonged standing.

Medical history

Medical history revealed that a workplace knee injury 7 years prior reduced her ability to exercise as weight-bearing caused pain. She was under the care of a physiotherapist for ongoing management. She had numerous fractures during childhood between the ages of 6–10 years of age and iron deficient anaemia during adolescence.

Family medical history

Both parents were obese with her mother diagnosed with Type 2 diabetes mellitus (T2DM). The client reported that her father had problems with high iron levels, but was unable to give specific information.

Point of care assessment

Table 1 outlines the point of care assessments conducted. Notable outcomes were: BMI 33.9 (obese) [1], waist circumference 100 cm (healthy <80 cm) [1] and high random total cholesterol 5.9 (target <5.5). Of concern was random blood glucose 8.7 mmol/L (ideal <8.0) and resting blood pressure (BP) 146/95. Although the single reading indicated hypertension, it was impossible to determine whether it was a persistent issue without further assessment, which warranted a referral to her GP. At the discretion of her GP, testing was suggested for: full blood count, thyroid function, urea, electrolytes and creatinine, serum calcium, liver function, fasting cholesterol profiles/blood glucose, vitamin D and iron studies.

Pathology

Following review by the GP, her BP had been monitored and was consistently high. Continuation of monitoring was recommended. A summary of relevant pathology results is outlined in Table 2.

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Table 1
Point of care assessment.

Clinical outcome	Initial measurement
Height (cm)	155
Weight (kg)	81.5
BMI	33.9 (obese)
Waist circumference (cm)	100
Random blood glucose (RBG) (mmol/L)	8.7 (90 min pp)
Random total cholesterol (R T chol) (mmol/L)	5.9 mmol/L (90 min pp)
Blood pressure (mmHg)	146/95
Heart rate (beats/minute)	65
Urinalysis	NAD

Table 2
Pathology summary.

Test	Value	Range
Vitamin D (nmol/L)	41	75–250
Ferritin (ng/mL)	152	15–165 (pre-menopausal)
Total cholesterol (mmol/L)	5.7	<5.5
LDL cholesterol (mmol/L)	2.8	<2.5
TG (mmol/L)	1.8	<1.5
Fasting glucose (mmol/L)	5.7	3.0–5.4
ALT	45	<41

As shown in Table 2, vitamin D status was 41 nmol/L. This was identified as a deficiency according to the reference range 75–250 nmol/L, as defined by the pathology provider. Vitamin D deficiency is a significant find given the presentation of osteopenia. The GP recommended vitamin D3 5000 IU/day to replete status.

Total cholesterol, LDL cholesterol, triglyceride (TG) and fasting glucose were all consistent with metabolic syndrome (MetS), as outlined by the International Diabetes Federation [1].

Ferritin was high within the normal range, though given that the client was still menstruating, monitoring of iron status post-menopause was recommended. Mild elevation of ALT was of unknown aetiology.

Goal setting and challenges

The client identified feelings of poor health as the primary motivation for change. Knee pain had escalated with weight gain and was impacting on her mobility. She identified lack of family support as her main challenge. She often felt pressure to eat from

her mother, whose house they dined at multiple times per week. She identified contact with the practitioner as the key to maintaining change.

A 12-week plan was developed with set weekly appointments for accountability. The goals were broken into two segments of –5 kg and –6 cm waist circumference to ensure it felt achievable.

Treatment strategies

A summary of treatment strategies is outlined in Table 3.

Correcting vitamin D status was of priority as improved status has been shown to enhance glucose tolerance and insulin sensitivity [2] in addition to benefits for maintaining bone density when combined with calcium [3]. To provide additional calcium, the client was recommended to increase the supplement to twice daily to provide 500 mg/day in conjunction with increased dietary calcium to achieve recommended daily intake (RDI) of 1300 mg [4].

Fish oils were supplemented to the equivalent of 800 mg EPA and 600 mg DHA daily. Fish oil supplementation has been found to provide a slight reduction in blood pressure and a significant reduction in TG [5,6].

Magnesium biglycinate 150 mg twice daily was recommended as part of a multi-nutrient formula. Magnesium biglycinate was recommended as it has been shown to have increased bioavailability and is better tolerated compared to magnesium oxide [7,8]. Intracellular magnesium has been shown to improve insulin sensitivity, hyperglycaemia and vascular tone [9,10]. The total magnesium dose delivered was 500 mg/d which includes that provided by the calcium supplement. A dose of 500–1000 mg/d has been shown to lower BP [9].

The client was advised to consume 3 g of dietary cinnamon daily. Powdered *Cinnamomum aromaticum* was provided by the practitioner. Short-term studies have shown that a single 3 g dose of cinnamon given orally caused a significant reduction in postprandial glucose and insulin response. The effect was observed for up to 12 h post ingestion [11]. Oral doses of 3 g given daily over 8 weeks showed improvements in fasting blood glucose, glycosylated haemoglobin, TG, weight, BMI and body fat mass [12]. Whilst clinical trial results overall have been inconsistent, cinnamon has potential in the management of MetS due to its hypotensive, anti-inflammatory and antioxidant properties [11].

Table 3
Treatment strategy summary.

Treatment	Dose	Recommended by
Raloxifene hydrochloride	60 mg daily	GP
Vitamin D	5000 IU daily	GP
Fish oils	Equiv. to 800 mg EPA and 600 mg DHA daily	Naturopath
Magnesium biglycinate	150 mg twice daily	Naturopath
As multi-nutrient formula including:		
Taurine 300 mg		
Glutamine 250 mg		
Ascorbic acid 150 mg		
Calcium (as phosphate) 31.4 mg		
Potassium (as phosphate) 182 mg		
N-acetyl carnitine 58.75 mg		
Pyridoxine hydrochloride 25 mg		
Nicotinamide 25 mg		
Thiamine hydrochloride 15 mg		
Riboflavin 0.95 mg		
Chromium (as nicotinate) 12.5 mcg		
Calcium	Increased to 2 tablets daily	GP/naturopath
Cinnamon (dietary)	3 g daily	Naturopath
Implement whole foods, low glycaemic index diet		Naturopath
Increase dietary magnesium, potassium and calcium		Naturopath

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