



PERSPECTIVES ON THE NUTRITIONAL MANAGEMENT OF METABOLIC SYNDROME IN ASIA: PEOPLE, PRACTICE AND PROGRAMMES

Chee Huei Phing

Faculty of Science, Universiti Tunku Abdul Rahman, Kampar, Perak, Malaysia

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Abstract

Numerous Asian countries have a high prevalence of metabolic syndrome, also associated with cardiovascular disease and diabetes mellitus. Healthcare expenditure varies among Asian countries, and is influenced by poverty factor and large populations. The effect of metabolic syndrome on nutritional management in Asia demonstrates the essential for clinicians to equalize the needs for higher standards of dietetics practice; as they execute optimal care processes with the aim of improving outcomes, alongside setting of workforce limitations, inadequate expertise in metabolic syndrome nutrition practice, as well as ethnic diversity among Asians. This paper presents some aspects of dietetics practice and the possibility that an alteration in practice is mandatory if dietitians are to play an active role in preventing or decelerating the evolution of the metabolic syndrome.

key words: *Metabolic Syndrome, nutritional management, dietitians*

Introduction

The relationship of multiple risk factors, explicitly abdominal obesity, high blood pressure, dyslipidemia and impaired glucose tolerance, and their expected correlation with insulin resistance has been related into an entity denoted as “metabolic syndrome”. The practicality of identifying and treating the “metabolic syndrome” is being questioned [1,2]. The metabolic syndrome may not be a disorder per se, but the concept is clinically beneficial to aid the treatment of numerous goals for the prevention of cardiovascular disease and diabetes. Medical nutrition therapy offered by registered dietitians is a fundamental component in the treatment of all metabolic risk factors,

whether they develop individually or together. Elements of medical nutrition therapy comprise weight management, a healthy dietary pattern and physical activity [3]. These healthy lifestyle changes help to decrease all of the metabolic risk factors concurrently.

Although understanding the science and principle suggestions for a disease state is crucial, unless individuals can apply lifestyle behavioural modifications, the knowledge is of no use. Hence, the responsibility of the registered dietitian is to execute medical nutrition therapy for the metabolic syndrome in a way that makes possible behavioural modifications that lead to the achievement of desirable outcomes.

Jalan Universiti Bandar Barat, 31900, Kampar, Perak, Malaysia,
Telephone number: +605-468 8888 Extension: 4526; *corresponding author e-mail:* cheehp@utar.edu.my

Vast economic growth over the past four decades in Southeast Asia, and specifically in latest decades for India and China, has led to changes in lifestyle patterns. For Asians, this translates to urbanization, sedentary lifestyles, and alterations in patterns of dietary intake, with the final endpoint of an increase in the metabolic diseases prevalence.

Incidence of Metabolic Syndrome in Asia

Asia is being hit the hardest in the global epidemic of obesity and diabetes. A total of 17 million individuals die annually from cardiovascular disease globally. Of these deaths, approximately 11 million will happen in developing areas, such as Asia [4]. A total of 1,000 million individuals globally are overweight; more than 388 million individuals are predicted to die from a chronic disease in the subsequent 10 years, primarily by cardiovascular diseases [4]. Most of these people are predicted to come from Asia. The estimated costs in both financial and human terms are staggering. Specifically, it has been predicted that China will lose 558 billion USD over the following 10 years due to premature mortalities from diabetes, heart disease and stroke [4].

Diabetes renal disease is closely associated with numerous risk factors of the metabolic syndrome, and has been reported to have a prevalence of 60% among Asians with diabetes [5]. With the onset of chronic renal disease, there are further alterations in the metabolic environment of the body which noticeably rise the risk of cardiovascular diseases [6]. Other lifestyle factors besides metabolic syndrome are practical tools to recognize people who are at high risk for diabetes. However, once diabetes is diagnosed, comprehensive evaluations, such as the documentation of complications and assessment of other risk factors becomes essential to decrease the risks to health.

Although people of Asian origin have smaller body build, they tend to build up extra body fat and develop cardiovascular risk factors at a smaller waist circumference or lower body weight than Caucasians. For instance, the prevalence of the metabolic syndrome in Singapore raised by 5% to 10% if the Asian classification for obesity was applied rather than that applied for Caucasians [7]. On the other hand, it was estimated that 64 million had the metabolic syndrome in China based on a body mass index cut-off point of $\geq 30 \text{ kg/m}^2$ to classify obesity. However, 187 million Chinese were obese and 71 million had the metabolic syndrome if a body mass index cut-off point of $\geq 25 \text{ kg/m}^2$ was used [8].

Considering these ethnic differences, both the World Health Organization and the International Diabetes Federation have adopted a body mass index cut-off point of $\geq 23 \text{ kg/m}^2$ and $\geq 25 \text{ kg/m}^2$ as the definition of overweight and obesity in Asians, respectively. On the other hand, abdominal obesity was characterized as a waist circumference of $\geq 80 \text{ cm}$ in females and $\geq 90 \text{ cm}$ in males [9]. The prevalence of the metabolic syndrome has been demonstrated consistently to range from 10% to 40% in most Asian countries, such as China, Taiwan, Hong Kong, Korea, Vietnam, Japan, India Singapore and Philippines based on these modified definitions [4].

In Asia, the rise in the prevalence of diabetes will occur mainly in young to middle-aged people. This is to a certain extent due to the increasing prevalence of childhood obesity, which influences approximately 15% of children and adolescents in wealthy communities [4]. The governments of both Taiwan and Japan have executed national screening programmes for diabetes. According to surveys carried out between 1974 and 2002 in Japan, the overall annual incidence of type 2 diabetes in school

children increased from 1.7 per 100,000 (before 1980) to 2.8 per 100,000 (after 1981). More than 80% of the affected children or adolescents were obese [10]. On the other hand, according to a 1999 survey in Taiwan, the rate of newly diagnosed diabetes was 9 per 100,000 for males and 15 per 100,000 for females. Family history, high blood pressure, obesity and high blood cholesterol were the major risk factors [11].

Treatment Modalities

The principal goals in managing individuals with metabolic syndrome are to decrease risk for type 2 diabetes mellitus and cardiovascular disease. For decrease of disease events, first-line treatment comprises discontinuing cigarette smoking and decreasing blood pressure, LDL-cholesterol and glucose levels to normal ranges [3]. Nutrition intervention concentrates on attaining goals for the final three.

For individuals with the metabolic syndrome, nutrition intervention concentrating on lifestyle modifications and offered by

registered dietitians can decrease the risk for future development of cardiovascular disease and type 2 diabetes mellitus. Interventions that include physical activity promotion, weight control and a diet designed to reduce atherogenic risk are fundamental components in the treatment of all elements of the metabolic syndrome.

Nutrition intervention designed around a patient-centered framework is usually more challenging and time-consuming. However, its chances for success are superior. Simply conveying information is inadequate to ensure action. In addition, continuing support and education from registered dietitians and other healthcare professionals is just as crucial as support from others to assist patients in decision-making strategies.

No single diet is presently suggested for individuals with metabolic syndrome [12]. Hence, it may be best to concentrate on each individual's particular metabolic alteration when providing dietary advice, as detailed in Table 1.

Table 1. Principle of nutrition management for metabolic syndrome.

Parameter	Principle of nutrition management
Physical activity	Increase physical activity - 150 minutes of moderate intensity physical activity per week [13], or - 75 minutes of vigorous intensity physical activity per week [13], or - 10,000 steps per day [14].
Body weight	Reduce body weight - To achieve a decline of about 7% to 10% from baseline total body weight during a period of 6 to 12 months until achieve a BMI <25 kg/m ² [15]
Carbohydrate intake	Reduce total carbohydrate intake [15] - Recommended level: 50-60% of total calories
Fat intake	Replacing saturated fat with omega-3 fatty acids Total fat intake: 25-30% of total calories Monounsaturated fat: 12-15% of total calories Polyunsaturated fat: 5-7% of total calories Saturated fat: 7-10% of total calories Trans fat: <1% of total calories [15]
Alcohol intake	Control alcohol consumption [15] - Control alcohol to ≤ two units daily for men or one unit daily for women - A unit is characterized as 1.5 ounces of hard liquor (whisky), 5 ounces of wine and 12 ounces of beer
Sodium intake	Sodium reduction [15] - <2400 mg sodium or 6 g sodium chloride daily
Fruits and vegetables consumption	Increase consumption of fruits and vegetables [15] - Consume four to five servings of vegetables and fruits daily

Table 1. Continued.

Parameter	Principle of nutrition management
Low-fat dairy products consumption	Choose low-fat dairy products [15] - Consume two to three servings of low-fat dairy products daily
Dietary fiber intake	Increase dietary fiber [15] - 20-30 g daily
Abdominal obesity	Increase physical activity Reduce body weight
Hypertriglyceridemia	Reduce body weight Increase physical activity Reduce total carbohydrate intake to recommended level Reduce total fat intake to recommended level Control alcohol consumption
Low HDL cholesterol level	Reduce body weight Increase physical activity Reduce total fat intake to recommended level
High blood pressure	Reduce body weight Increase physical activity Reduce total fat intake to recommended level Sodium reduction Increase consumption of fruits and vegetables Choose low-fat dairy products Limit alcohol consumption Choose low-fat dairy products
High fasting glucose level	Reduce body weight Increase physical activity Reduce total carbohydrate intake to recommended level Increase dietary fiber

However, other factors such as individual preferences and conditions must be considered in the decision making process in addition to these standard recommendations. The guidelines should be individualized to each individual based on their health profile and lifestyle [3,12,16-21].

Where is the dietitian?

Dietitians have been ranked the 3rd best job for saving the world [22]. Access to “any kind of dietary advice” is cited as a factor of the quality of pre-referral care. To obtain an understanding of the incorporation of the dietitian into the management of individuals with metabolic syndrome, a short questionnaire was circulated via e-mail to practicing dietitians (Chee Huei Phing, PhD, unpublished data). Practicing dietitians were targeted as respondents, and responses (n=30) lent credence to the observation that committed dietetics service in

the metabolic syndrome management is deficient in the countries that participated (Malaysia, Thailand, Hong Kong and Japan).

Policy changes

Despite this alarming epidemic of metabolic syndrome, over 80% of mortalities from type 2 diabetes mellitus and cardiovascular diseases can be avoided. Effective prevention program have been kick-started in Asia. In India, China and Japan, lifestyle modification program with specific highlight on physical activity promotion (30 minutes of brisk walking most days of the week), complying to a balanced, high fiber and low fat diet, and modest weight loss of 2% to 5% body weight have been demonstrated to decrease the risk of progression from impaired glucose tolerance to diabetes by 67% [23]. The participation of a multidisciplinary team to achieve targets and enhance adherence to therapy has also been demonstrated to reduce

mortality and morbidity by 70% in individuals with diabetes [23].

The concerted efforts of governments, advocacy groups and communities are warranted to translate the evidence into clinical practice. The World Health Organization has already recommended for the development of countrywide prevention and surveillance programs against non-communicable diseases. These programs aim to accumulate population-based data, scrutinize disease trends, and produce an environment that is favorable to promoting healthy lifestyles via interdisciplinary, multi-sectoral collaborations.

Lifestyle is closely associated with habits, cultures and values. Thus, health education must begin early in life and incorporate schools and parents. The implementation of school-based plans, such as the banning of machines selling high sugary drinks and obligatory physical education seem to have curtailed the escalating trend of obesity in certain countries.

Given the uprising tide of metabolic syndrome, its prevention “at the grass roots level” is pivotal. Dietary intervention shall be given by the dietitians and healthcare workers should provide feedback on diet adherence. Efforts to prevent metabolic syndrome via screening, identification and enhanced management of metabolic syndrome shall be initiated. These initiatives are reliant on the accessibility of dietitians, who are in short supply in Asia.

One can hypothesize on the rationales for minimal partaking of Asian dietitians in the management of metabolic syndrome. For instance, inadequate staff numbers to cover all medical departments inhibit skills specialization. The rotation of dietitians through numerous postings also inhibits skills advancement and

involvement in the multidisciplinary team, leading to the perception that dietitians are negligible stakeholders in care for individuals with metabolic syndrome. However, given the escalating incidence of metabolic syndrome and the restricted health care expenditure by governments, a paradigm shift is warranted that will lead to the preparation of Asian dietitians for involvement in multidisciplinary nutrition care.

Conclusions

Our societies and communities have experienced remarkable cultural, technological, socio-economic and political alterations. While numerous of these have enhanced the quality of life and standards of living, the outcomes of mechanization and urbanization have taken an intense toll on health, specifically in young people.

There are several challenges in the future. However, Asia, with its socio-economic growth, diverse ethnicities and epidemiological transition, is in an unparalleled position to resolve the interactions between genetics, environment and lifestyles with the manifestation and progression of these diseases.

Nutrition therapy interventions for the metabolic syndrome comprise weight maintenance or its reduction, increase in physical activity, higher fiber and whole grain intake, and a change in the quality and quantity of fats. Dietitian plays an important role in assisting individuals with the metabolic syndrome to make lifestyle modifications that change the factors that raise risk of cardiovascular disease and type 2 diabetes mellitus.

Conflict of interest. Author has declared that no competing interest exists.

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