

Concurrent Session 6

Changes to diet and physical activity have the potential to treat the metabolic syndrome in female Pakistani immigrants

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Background - The Metabolic Syndrome is a multifactor disorder which includes obesity insulin resistance hypertension, alteration in glucose and lipid metabolism. The disorder has been identified as an area requiring vigorous lifestyle intervention. It has been established that weight loss significantly improves all aspects of the Metabolic Syndrome. South Asians in Britain have been shown to be a high-risk population for coronary heart disease and other insulin resistance related conditions. It is believed that other migrant South Asians are high risk populations but there is limited data to show this.

Objectives - To describe the current risk factor status with respect to the Metabolic Syndrome for a group of female Pakistani migrants in Australia. This is important baseline data will be used to develop a culturally appropriate intervention for this population.

Design - A pilot sample of Pakistani female volunteers (n=15, age=37.6±4.3 years {all data is ± SEM}) was recruited from urban Melbourne via snowballing techniques. Volunteers were screened for the presence of two or more components of the Metabolic Syndrome, according to the ATP III criteria.¹ Baseline data was collected with participants completing a questionnaire on their state of health, dietary pattern in Australia and physical activity. The intervention was built around a food and exercise manual. In addition anthropometric measurements, blood pressure, blood lipid profile, blood glucose and insulin levels were collected.

Results- Results indicated that this group of female Pakistani migrants were obese (BMI 31.5±1.4), hypertensive (systolic 145.6±4.1 mmHg, diastolic 88.6±1.3 mmHg), hypertriglyceridaemic (1.3±0.3 mmol/L) and three were diabetic. In addition all were inactive taking less than 4000 steps per day measured by pedometer.

Conclusion- The results suggest that this group of female Pakistani migrants suffer from the Metabolic Syndrome and that a culturally sensitive program of dietary modification and increased physical activity has great potential to treat their condition.

References

1. Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection Evaluation and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) NIH Publication No. 02-5215 September 2001.

Effects of dietary weight loss on sympathetic activity and cardiac risk factors associated with the metabolic syndrome

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Background - Weight reduction, the first-line treatment for the metabolic syndrome, improves insulin sensitivity and associated metabolic and cardiovascular abnormalities but there is a paucity of data regarding its effects on sympathetic nervous system (SNS) activity in this clinical setting.

Objectives - 1. To test the hypothesis that dietary weight loss attenuates both insulin resistance and SNS activity 2. To examine the relationships between SNS activity, metabolic and cardiovascular parameters.

Design - Twenty-three metabolic syndrome subjects (ATP III criteria, age 58 ± 2 yr, body mass index 33.3 ± 0.8 kg/m², mean ± SEM) participated in a 3-month dietary weight loss program, using a modified DASH diet (26% fat, 22% protein, 51% carbohydrate, 100 mmol/day sodium). Before and following treatment participants underwent measurements of postganglionic muscle sympathetic nerve activity (MSNA, microneurography at a peroneal nerve), whole-body plasma norepinephrine spillover, spontaneous cardiac baroreflex function, oral glucose tolerance and insulin sensitivity.

Outcomes - A mean weight loss of 6.3 ± 0.7 kg or 7% of initial body weight resulted in significant improvements of all metabolic syndrome components. These changes were accompanied by significant decreases in norepinephrine spillover rate (by 43%, P= 0.005) and MSNA (from 40.6 ± 2.1 to 34.6 ± 2.4 bursts/min, P= 0.01) and an improvement in cardiac baroreflex sensitivity (from 7.4 ± 0.6 to 9.0 ± 1.0 ms/mmHg, P= 0.02). The decrease in norepinephrine spillover correlated positively and independently with change in plasma leptin concentrations (r =0.49, P=0.03). Subgroup analyses showed that only those subjects who were insulin resistant at baseline (HOMA ≥ 2.5) experienced a significant reduction in norepinephrine spillover, despite similar weight loss in insulin resistant and insulin sensitive subjects.

Conclusions - Weight loss by a hypocaloric diet with moderate sodium restriction diminishes sympathetic activity in metabolic syndrome subjects. This may be due to the consequences of decreased leptin concentrations, enhanced insulin sensitivity or improvements in cardiac baroreflex function.