



Pilot Study

Diabetes and Weight Loss: a Pilot Study

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Introduction

Most people with type 2 diabetes are found to be also obese. Research provides strong evidence linking obesity to diabetes, and that some weight loss can prevent the development of the disease or reduce its comorbidities (1;2). Diet and physical activities, often supported by pharmacotherapy remains the mainstay treatment for diabetes.

Malaysia has one of the highest diabetes prevalence in the world, and the highest obesity rate in South East Asia. Notably, the country has experienced a triple increase in DM2 (from 6% to 20%) and obesity (from 15% to 40%) incidences in the past 2 decades. Such dual epidemic is observed in many countries (5) and it is arguably not coincidental. As effective as it is in controlling hyperglycemia, medication does not treat the root of the problem—i.e, those risk factors that contribute to the development of disease or its complications, such as dietary habit, physical inactivity and obesity (3;4). There is a need to incorporate the management of those lifestyle risk factors into a comprehensive care plan for diabetes.

Purpose/Method

The primary objective of this study was to examine the feasibility of a program on weight loss through lifestyle modification on patients with diabetes.

Patients with diabetes or elevated blood sugar were referred to the lifestyle clinic at the hospital where they would be enrolled in a 10-week (70 days) weight loss program. The non-drug therapy consists of providing calorie-controlled healthy meals daily, 3 times a week exercise classes and once a week group classes focusing on motivation and behavioral change.

**About the
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Results

A total of 8 patients with diabetes history ranging from newly diagnosed to 30 years of duration were enrolled in the program. Everyone lost weight, between 4.8kg to 12kg (6% to 13.5% of total body weight), average weight loss of 8kg (9.6%) in 10 weeks. For every 1% drop in body weight there is a corresponding 2% drop on fasting glucose. All 8 participants reduced their waist circumference by average of 7.4cm (8%) and body fat by average 3.8%.

The fasting blood glucose was lowered in every participant, with an average reduction of 18.6% or 1.5mmol/L. notably, the reduction is comparable to the effect achieved by some of the most commonly used glucose lowering medications (e.g., sulfonylureas or metformin). All participants improved their cardiovascular (CV) risk factors: reduction in blood pressure, triglycerides and waist circumference. One patient with 15 years of diabetes successfully weaned off insulin injection. Another one got off her diabetes medication completely.

Discussion

The causal relationship between excessive body fat and diabetes has been acknowledged over the past decades in the literature (6;7). Nonetheless, most diabetic care focuses on drug therapy, and very few incorporate health promotion focusing on weight loss. Though our number of cases is small, the finding in this pilot study suggest that weight loss through diet and exercise is effective in managing diabetes and many of its CV risk factors. The pilot study also suggests, that a loss of Body fat appears to increase insulin sensitivity of the diabetes patients.

Conclusion

Most non-pharmacological aspect of diabetic intervention involves diet, exercise and behavioral therapy. Our intervention provides all the above, plus a provision of daily caloric restricted meals to the diabetic patients with the aim of inducing weight loss. We do not just teach and motivate people to lose weight, we show them how by providing them the food. The intensive lifestyle therapy resulted in a significant amount of weight loss among the participants, who at the same time experienced improvement in many other health parameters, with some completely got off their medication.

Overall, this pilot study shows that the weight loss program is feasible for our Malaysian patient group.



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Table 1 Change in weight and cardiovascular risk factors for all participants

Demographic Data			Weight			Body Mass Index (BMI)			Cardiovascular (CV) Risk Factors							
									Waist Circumference			Blood Pressure		Triglycerides		
Participant			Before	After	Difference	Before	After	Diff	Before	After	Diff	Before	After	Before	After	
(n=8)	Age	Gender	kg	kg	%	kgm ⁻²	kgm ⁻²	%	cm	cm	%	mmHg	mmHg	mmol/L	mmol/L	%
1	47	Male	80.0	75.2	-6	30.7	28.7	-6.5	99	93	-6.1	130/80	124/71	2.0	1.7	-15.0
2	49	Male	98.1	85.9	-12.4	34.4	30.0	-12.8	101	97	-4.0	130/70	126/70	1.4	1.0	-28.6
3	51	Female	65.6	56.7	-13.5	32.2	27.8	-13.7	96	87	-9.4	120/70	105/70	0.8	0.7	-12.5
4	53	Female	77.3	69.9	-9.6	29.1	25.3	-13.1	89	79	-11	130/80	120/80	0.9	1.7	+88.9
5	58	Female	74.0	64.5	-12.8	30.0	26.2	-12.7	84	75	-11	140/90	120/90	2.7	1.4	-48.1
6	60	Female	111.0	103.1	-7.1	45.0	44.6	-0.9	125	118	-7.9	130/90	140/80	1.2	1.9	+58.3
7	61	Female	93.0	85.3	-8.3	32.6	29.4	-9.8	90	86	-4.4	120/80	120/80	1.8	1.2	-33.3
8	71	Female	88.4	82.1	-7.1	31.7	30.0	-5.4	100	90	-10	120/80	126/72	2.0	1.8	-10.0
Mean	56		85.9	77.8	-9.6	33.2	30.3	-9.4	98.0	90.6	-8.0	128/80	123/77	1.6	1.4	0

Table 2 Fasting blood glucose changes for all participants

Participant	Before	After	Difference	Years of DM	
(n=8)	mmol/L	mmol/L	mmol/L	%	
1	8.9	6.3	-2.6	-29.0	6
2	5.7	5.0	-0.7	-12.0	N/A*
3	9.0	4.3	-4.7	-52.0	15**
4	10.2	9.6	-0.6	-5.9	18
5	5.9	4.7	-1.2	-20.0	<1*
6	6.7	6.2	-0.5	-7.5	10
7	5.6	5.2	-0.4	-7.1	3***
8	7.8	6.7	-1.1	-14.0	30
Mean	7.5	6.0	1.5	18.6	

N/A: Not Available

* Patients did not take any Oral Hypoglycemic Agent (OHA) prior to intervention

** Patient did not need insulin injection after intervention

*** Patient did not need OHA after intervention

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