The Long Term Efficacy of an Integrated Behavioral and Medical Based Diabetes Prevention Program

Mia Wright MSIII, Maurice Lee, MD MPH

St. Vincent de Paul Medical & Dental Clinic and University of Arizona COM Phoenix

Introduction

Childhood obesity and diabetes are on the rise. Since 1990, there has been a 60 percent increase in the number of overweight & obese preschool children with 43 million being reported in 2010 (1). Of youth with type 2 diabetes, 79.4% of them were obese and 10.4% were overweight (2). As this trend continues the comorbidities associated with adolescent obesity and type 2 diabetes will also rise. Unfortunately, little is known about the long term efficacy of diabetes prevention programs that target high risk youth.

At the Virginia G. Piper St. Vincent de Paul Medical & Dental Clinic (SVdP), the Every Little Step Counts (ELSC) diabetes prevention program recruits high risk Hispanic youth throughout the community to participate in 12 bi-weekly two hour long classes. There is 1-hour physical activity and 1 hour split between wellness and nutrition. The ELSC has collected pre and post-program data on all the youth that have participated since 2005.

Objective

To determine the long-term efficacy of an integrated behavioral and medical program targeted at high risk youth.

- Primary Outcome: development of diabetes mellitus
- Secondary Outcome: Development of HTN, changes in BMI/obesity, rates of adopted healthy behaviors.

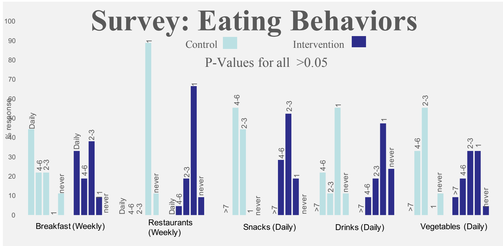
Methods

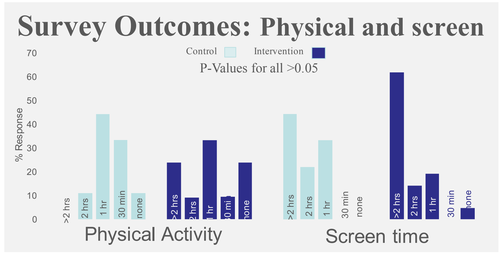
- Subjects were recruited through a database review of SVdP's ELSC program
- All adolescents who completed the ELSC program and had a current phone number on file were contacted & recruited to participate in the study as the intervention group.
- Youth in the community who were seen in the clinic during the same time frame but did not complete the program were recruited as the control group.
  - Inclusion Criteria for control: Youth recruited to ELSC but did not participate or did not complete at least 75% of the required classes.
  - Exclusion Criteria: A prior diagnosis of diabetes or treatment for diabetes
- Participants returned to the clinic to have their HbA1c, BMI percent, and BP measured. Participants also completed a health behavior questionnaire.
- Quantitative and qualitative data for the intervention and control were compared before and after completing the program as well as at follow up.

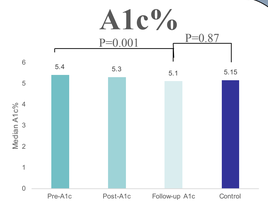
Results

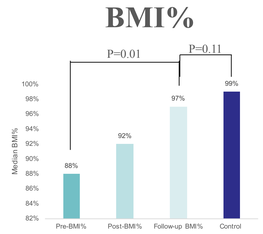
Table 1: Demographic Characteristics of the Participants

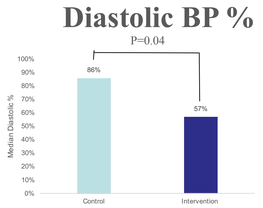
Characteristic	All participants (N = 30)	Intervention Group (N = 21)	Control Group (N = 9)
Age group			
10-13	18 (60%)	14 (66.7%)	4 (44.4%)
14-17	12 (40%)	7 (33.3%)	5 (55.6%
Sex – No.			
Female	11 (36.7%)	7 (33.3%)	4 (44.4%)
Male	20 (63.3)	14 (66.7%)	5 (55.6%)
Months since program or last clinic visit			
0-24		1 (4.8%)	
25-48		12 (57.2%)	5 (62.5%)
>49		5 (23.8%)	3 (37.5%)
Family Hx of DM	N = 22	N = 14	N = 8
Yes	15 (68.2%)	11 (78.6%)	4 (50%)
No	7 (31.8%)	3 (21.4%)	4 (50%)

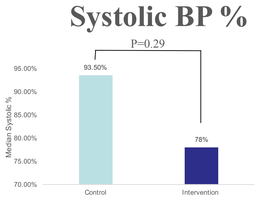












Conclusions

- Compared to the control group there were no significant statistical differences in:
  - A1c% (p=0.87)
  - Systolic BP and BP% (p=0.21 and p=0.29)
  - BMI% (p=0.11)
- Compared to the control group there was a statistically significant difference in:
  - Diastolic BP and diastolic BP% (p=0.02 and p=0.04)
  - Weight and BMI (p=0.02)
- There was no statistically significant difference in health behaviors between the two groups (all p>0.05)
- The pre/post intervention group data demonstrates a statistically significant:
  - decrease in A1c% (p=0.001)
  - increase in BMI% (p=0.01)

Discussion

Results are conflicting, the increasing BMI and lack of clinically significant difference in many of the biometrics would support that the program has not led to a difference in the risk of developing DM in this high risk youth population.

On the other hand the incidence of DM in this age group is so low it was not expected that there would be a difference in patients converting to DM with a sample size as small as ours but the data does demonstrate a trend towards early markers of metabolic syndrome in the control group vs the intervention group in the statistically significant higher BMI and diastolic BP.

Time will tell if the program was successful at preventing co-morbidities related to being overweight and obese as many of the chronic diseases do not manifest until the 4th-5th decade of life.

Weakness of the study include:

- Small sample size
- Short follow up interval
- Not generalizable
- Difficulty recruiting participants to return to the clinic

References

1. de Onis M, Blossner M, Borghi E. Global prevalence and trends of overweight and obesity among preschool children. *Am J Clin Nutr*. 2010;92(5):1257-1264.
2. Liu LL, Lawrence JM, Davis C, et al. Prevalence of overweight and obesity in youth with diabetes in USA: The SEARCH for diabetes in youth study. *Pediatr Diabetes*. 2010;11(1):4-11.

Acknowledgements: Ryan Melikan, Mahnoor Mukarram, Valeria Valverde-Vesling,