ABSTRACT

Diabetes is one of the most costly chronic diseases of our time, and is a condition that is increasing in epidemic proportions worldwide (King *et al* 1998). Complications resulting from this disease are a significant cause of morbidity and mortality. It is possible to prevent or delay the onset of diabetes by identifying high-risk individuals with "pre diabetes" – Impaired Fasting Glucose (IFG) / Impaired Glucose Tolerance (IGT)- and changing their risk factor profile (obesity, physical inactivity, unhealthy diet, smoking and high alcohol consumption) using a lifestyle intervention (U.S Department of Health and Human Services 2005). Effectiveness of lifestyle interventions aimed at prevention of diabetes has been demonstrated so far only among high risk IGT subjects (ADA 2006).The present study was carried out to evaluate the effectiveness of a lifestyle intervention aimed at prevention of diabetes among the high risk IFG subjects, in a resource limited setting.

The study consisted of three components. Component one validated the International Physical Activity Questionnaire (Interviewer Administered –Long form) (IPAQ-IA(L), component two developed a lifestyle intervention package, and component three was a cluster-randomized trial to evaluate the effectiveness of a lifestyle intervention aimed at prevention of diabetes among the high risk IFG group.

IPAQ (IA-L) showed good test-retest reliability and moderate degree of criterion validity. Hence, this could be applied to assess the physical activity among the adults in a similar setting.

The lifestyle package was developed in consultation with experts in the field of public health and clinical medicine, Family Health Workers and IFG subjects. This package was pilot tested before application in the main study.

The intervention study was conducted as a cluster randomized trial (n=190) in a rural area in Gampaha district, utilizing the existing public health system with a view to extrapolating findings the to Sri Lankan setting.

This study has shown effectiveness in reduction in fasting blood glucose ($p<0.01$) in the intervention group compared to the control group. Insulin sensitivity improved in the intervention group to the control group. However it was not statistically significant. Conversion to normoglycemia was higher in the intervention group (43.6%) compared to the control group (36.8%). Concurrently conversion to diabetes lower in the intervention group (5.9%) compared to the control group (13.7%). Nevertheless favorable direction seen in the intervention group with respect to conversion to normoglycemia and progression to diabetes was not statically significant. All these proxy measure have shown some effectiveness in the lifestyle intervention in primary prevention of diabetes.

There was also significant reduction in systolic blood pressure ($p=0.03$) and diastolic blood pressure ($p=0.01$) in the intervention group compared to the control group. This reflects the beneficial effects of lifestyle intervention on blood pressure.

A statistically significant weight reduction ($p= 0.03$) occurred in the intervention group compared to the control group, which could be explained by the intensive lifestyle intervention received by the intervention group.

It is notable that all domains, except leisure time activity, showed significant improvements ($p<0.01$) in physical activity in the intervention group compared to the control group. Improvement in physical activity mainly observed in domestic domain reflecting the lifestyle intervention was successful in increasing the household activities.

There was a significant reduction in added sugar ($p=0.03$) and fat consumption ($p<0.01$) in the intervention group when compared with the control group at follow up assessment. The calorie intake and the total sugar intake were reduced in the intervention group compared to control group in a favourable direction. However both these measures were statistically not significant.

With the beneficial results observed in some of the primary and secondary outcome measures we can conclude that lifestyle intervention was effective in primary prevention of diabetes and reducing the existence of some modifiable risk factors among the high-risk

IFG group. Considering the expansion and disease burden due to diabetes, and the effectiveness observed in lifestyle intervention in primary prevention of diabetes among high-risk IFG group, it is important to translate these findings to practice to control this emerging public health burden. Incorporation of activities aimed at primary prevention of diabetes to the public health primary care setting is needed as one important component in the integrated overall strategy in controlling the diabetic epidemic in Sri Lanka.