

Lifestyle modification reduces the risk of T2DM, IGT and hypertension in urban Sri Lankans aged below 18 years

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BACKGROUND

There is an increasing incidence of type 2 diabetes mellitus (T2DM) in young urban South-Asians. The effects of lifestyle modification (LSM) on new onset T2DM, hypertension, and impaired glucose tolerance (IGT), in participants aged below 18 years with risk factors for T2DM has not been fully evaluated.

AIM

In post hoc analyses we tested the effect of a pragmatic 3-monthly LSM programme (P-LSM) versus a less-intensive 12-monthly control LSM (C-LSM) intervention in 1725 urban Sri Lankan participants (P-LSM n=850, C-LSM n=875) at risk of T2DM and aged below 18 years of age on a primary composite endpoint of predictors of cardio-metabolic disease [new onset T2DM, hypertension, IGT, impaired fasting glycaemia (IFG) and markers of cardio-renal disease] and the individual components of the primary endpoint.

METHODS

This was a post hoc analyses of data collected on 1725 participants who had taken part in completed clinical trial¹. The inclusion criterion for the trial was participants with two or more of the following four risk factors for T2DM; parental family history of T2DM, physical inactivity (defined as less than 30 minutes continuous exercise for less than 3 days a week), raised BMI (>standardized age and sex specific percentile cut-offs) and raised waist circumference (≥91st percentile for sex and age).

The 1725 participants received peer educator advice either 3-monthly (P-LSM n=850) or 12-monthly (C-LSM n=875) aimed at reducing weight, improving diet, reducing psychological stress, and increasing physical activity^{1,2}.

New cases of T2DM, IGT and IFG were diagnosed according to the American Diabetes Association criteria for OGTT tests. Hypertension was defined following Joint National Committee 7 guidelines (blood pressure that is, on repeated measurement, at the 95th percentile or greater adjusted for age, height, and sex¹. The median (range) follow up was 3 (1 to 4) years.

Poisson regression analyses were performed, with person-time as exposure, to estimate the incident rate ratio (IRR) with P-LSM as compared to C-LSM.

RESULTS

The baseline clinical and biochemical characteristics of participants in the two groups were similar, with no statistically significant differences. A significant impact of P-LSM on the incidence of the composite endpoint was noted in participants aged below 18; P-LSM n=140 (48 per 1000 person years vs. C-LSM n=174 (55.4 per 1000 person years) an IRR 0.83 (0.73 to 0.94) p=0.004 Table 1. A significant reduction in new onset IGT (P-LSM n=46 vs. C-LSM n=63), IRR 0.74 (0.6 to 0.9) p=0.009, T2DM (P-LSM n=4 vs. C-LSM n=9) a IRR 0.48 (0.24 to 0.94) p=0.03 and hypertension (P-LSM n=33 vs C-LSM n=57) IRR 0.6 (0.47 to 0.76) p=0.001 was also observed with P-LSM in participants aged below 18 years of age (Table 1). We also observed an increase in self reported physical activity (defined as >600 MET/min-week) from baseline in both groups with a significant difference between groups (P-LSM>C-LSM) and a significant effect of P-LSM as compared to C-LSM on increasing behaviour change with related to increasing physical activity (p<0.05 for both).

Table 1 Effect of pragmatic lifestyle modification as compared to control lifestyle modification on the incidence of the primary cardio-metabolic composite endpoint and its individual components in 1725 healthy participants aged below 18 years of age

Component of primary composite end-point	Pragmatic lifestyle modification N=850	Control lifestyle modification N=875	Incident Rate Ratio (95% confidence Intervals)	P value
Composite	140	174	0.83 (0.73 to 0.94)	0.004
New onset T2DM	4	9	0.48 (0.24 to 0.94)	0.032
New onset IGT	46	63	0.74 (0.60 to 0.90)	0.009
New onset IFG	58	51	1.13 (0.93 to 1.4)	0.13
Hypertension	33	57	0.60 (0.47 to 0.76)	0.001

DISCUSSION

Our results demonstrate that a pragmatic peer educator delivered life style modification intervention programme significantly lower the risk of the composite cardio-metabolic endpoint, T2DM, IGT and hypertension in young urban Sri Lankans aged below 18 years of age.

Early interventions that can delay or prevent onset of T2DM and related cardio-metabolic markers is of clinical importance especially so in South Asian subjects, who are known to be at enhanced and premature risk of T2DM and CVD.

Our study highlights the importance of lifestyle modification intervention in young South Asian participants at risk of cardio-metabolic disease.

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References

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