

## SUMMARY

This prospective comparative study aimed to evaluate the role interplayed between serum levels of progranin-1 and YK-40, and obesity and diabetes. Also, the study aimed to determine the impact of weight reduction dieting regimens and aerobic exercise for 3 months on the evaluated parameters.

The study included 20 average weight children with normal HOMA-IR score as Control group, 25 overweight and obese children as Obese group and 25 diabetic children as Diabetic group. All children underwent clinical evaluation, determination of body weight and height for calculation of BMI. Fasting blood samples were obtained for estimation of FBG and FPI for calculation of HOMA-IR score and estimation of serum PRGN and YK-40 levels. Obese and diabetic children were assigned for diet regimen and aerobic moderate activity exercise twice weekly for 3 month for aimed weight loss of a minimum of about 500 gram weekly. At the end of the intervention period, BMI and HOMA-IR were re-determined with estimation of serum PRGN and YK-40 and the percentage of change were calculated.

Weight reduction interventions significantly reduced body weight of both obese and diabetic children compared to their baseline weight, despite obese children still had significantly higher body weight compared to diabetic children. The %EWL showed progressive increase throughout the duration of intervention in both diabetic and obese groups. At the end of 3-months, BMI was significantly reduced in both obese and diabetic groups, with non-significant difference between both groups. The %EBMIL showed progressive increase throughout the duration of intervention with significant difference of %EWL at 3-months compared to that recorded at 1-month and 2-months with

significantly higher %EBMIL at 1-, 2- and 3-months in diabetic children compared to obese children.

At the end of 3-months of weight reduction interventions FBG, FPI and HOMA-IR were significantly reduced in both obese and diabetic groups compared to their baseline BMI. However, diabetic children still had significantly higher FBG and FPI levels with significantly higher HOMA-IR score compared to obese children, but the % of change of FBG was significantly higher in diabetic children compared to obese children. On the other hand, the % of change of FPI levels and HOMA-IR scores were significantly higher in obese compared to diabetic children.

Baseline serum PGRN levels showed positive significant correlation with EW, BMI, FBG, FPI and HOMA-IR score. Stepwise regression analysis defined EW and FBG as dependent predictor for high serum PGRN  $\geq 205$  ng/ml and ROC curve analysis defined body weight and FBG score as sensitive, while EW, BMI and FPI could be considered as specific predictors for serum PGRN  $\geq 205$  ng/ml. Mean serum PGRN showed significant decrease after weight reduction interventions compared to baseline levels in both obese and diabetic children with significantly higher percentage of decrease in diabetic children.

Baseline serum YK-40 levels showed positive significant correlation EW, FBG, FPI and HOMA-IR score. Stepwise regression analysis defined HOMA-IR, EW and FPI as predictors for serum YK-40  $\geq 48.7$  ng/ml. ROC curve analysis defined BMI and HOMA-IR score as sensitive, while EW and FPI could be considered as specific predictors for serum YK-40  $\geq 48.7$  ng/ml. Mean serum YK-40 showed significant decrease after weight reduction interventions compared to baseline levels in both obese and diabetic children with significantly higher percentage of decreased serum YK-40 levels in obese children.