

# Prevalence of impaired glucose tolerance and insulin resistance in a sample of the 6- to 16-year-old overweight or obese pediatric population

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## Objectives:

Prevalence of obesity and its complications have been increased in childhood worldwide during recent decades. Obesity and insulin resistance were considered as problems of older ages previously. However, they became serious issues also in the pediatric age group. Obesity increases the risk of insulin resistance, type 2 diabetes mellitus and impaired glucose tolerance among children and adolescents and mortality due to cardiovascular diseases in adults. The aim of this study was to determine the prevalence of impaired glucose tolerance and insulin resistance among overweight or obese children and adolescents.

## Methods:

This cross sectional study was conducted in 199 children and adolescents aged between 6 and 16 years with body mass index (BMI) above the 85th percentile for their age and sex referred to the endocrine clinic of Qazvin children hospital during 2012. Physical examination including evaluation of weight, height, BMI was performed. Overweight was defined as a BMI between the 85th and 95th percentiles for children of the same age and sex; Obese was defined as a BMI over the 95th percentile for children of the same age and sex. Blood levels of fasting glucose (FPG) and insulin were measured after an 8 hour overnight fast. An oral glucose tolerance test was performed with 1.75 g/kg glucose for all the participants. Participants were characterized as having normal glucose metabolism, impaired fasting glucose (IFG), impaired glucose tolerance (IGT) or diabetes according to American Diabetes Association criteria. Homeostatic model assessment (HOMA) more than 3 was used to estimate insulin resistance (IR). Data were analyzed using descriptive statistics and Chi-square test.

Table 1. Clinical and biochemical characteristics of the study subjects

	Minimum	Maximum	Mean	SD
BMI	18.4	45	27.71	4.34
FPG	61	185	92.37	13.97
Insulin	2	76.8	15.87	10.19
HOMA	0.36	21	3.63	2.51

## Results:

Of 199, 82 were female. Mean age was 10.94±2.56. 17.6% and 82.4% of the participants were obese and overweight, respectively. Prevalence of impaired fasting glucose, impaired glucose tolerance and diabetes were found to be 15.6%, 7.5% and 4%, respectively. 51.3% of the participants were insulin resistant. There were no significant differences in prevalence of IFG, IGT and diabetes among obese and overweight subjects. 90.2% of subjects with IR were obese and 9.8% were overweight and the difference was statistically significant (P= 0.005). Gender differences in prevalence of IFG, IGT, diabetes and IR were not statistically significant.

## Conclusions:

Obesity is an important factor for the development of insulin resistance. Insulin resistance and glucose intolerance are common in obese and overweight children and adolescents and result in a significant risk for hypertension and cardiovascular diseases, as well as for type 2 diabetes mellitus. High prevalence of insulin resistance in the present study indicates the future burden of diabetes and emphasizes the importance of prevention programs in overweight or obese children and adolescents from early age in order to promote their present and future health.

## References:

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