PREVALENCE OF OBESITY AND OVERWEIGHT IN SCHOOL CHILDREN AGED 5 TO 12 YEARS OF KANNUR DISTRICT

Prasanth Karakkad[1], Kuruvilla John[2], Elizebeth V. Issac[3]

[1]Consultant, Department of Paediatrics, Ashoka Hospital, Kannur.
[2]Assistant Professor, Department of Paediatrics, Mount Zion Medical College, Adoor, Kollam.
[3]Assistant Professor, Department of Obstetrics and Gynaecology, Azeezia Medical College, Meeyannoor P.O., Kollam.

ABSTRACT

BACKGROUND
Obesity and overweight are increasing in young population due to lifestyle changes and various risk factors. Aims of study are to estimate the prevalence of overweight and obesity in school children aged 5-12 yrs. of Kannur district, the risk factors for overweight and obesity in children aged 5-12 yrs. complications associated with obesity.

METHODS
This is a descriptive/cross-sectional study done for a period of 1 year (June 2007 - June 2008) in government and private schools of Kannur district. Subjects of study were children between age group of 5-12 years attending selected government and private schools. By using appropriate statistical methods, sample size required for estimating a prevalence of obesity was found to be 2400. Cluster sampling technique is used. From a list of all schools, two strata were made as government schools and private schools from which three private schools and two government schools were selected using a simple random method. Absentees and those who have not given parental consent were excluded. Study variables are age, sex, socioeconomic status, birth weight, blood pressure, maternal education, television viewing, monthly income of parents, government/private school and family size.

RESULTS
Prevalence of obesity in study sample is 3%, overweight 7.25%, normal weight 71.75%, underweight 18%. Girls are more prone than boys to develop persistent obesity during adolescence. X^2 test for overweight showed the relation of age and gender with overweight is significant (p value 0.001 and 0.041, respectively). X^2 test for overweight and school showed that the relation between overweight and school is significant. X^2 test for obesity and birth weight shows that there is positive correlation between obesity and birth weight (p value=0.042). X^2 test for obesity and television watching shows significant correlation. Similarly, there was no significant correlation between maternal education and overweight in children. X^2 test for overweight and monthly income of parents shows significant correlation p value=0.000. X^2 test for overweight and blood pressure shows that relation between them are significant p value=0.001. X^2 test for overweight and family size shows that relation between them is significant p value=0.039.

CONCLUSION
Obesity in children is associated with birth weight, socioeconomic status, family size. No association was found between television watching, maternal education.

KEYWORDS
Obesity, Birth Weight, Gender, Family Size.

INTRODUCTION: BACKGROUND: Obesity and overweight are increasing in young population due to lifestyle changes and various risk factors. This study is conducted to find the prevalence of obesity and correlation between obesity and various risk factors. Aims of study are to estimate the prevalence of overweight and obesity in school children aged 5-12 yrs. of Kannur district to estimate the risk factors for overweight and obesity in children aged 5-12 yrs. to estimate complications associated with obesity.
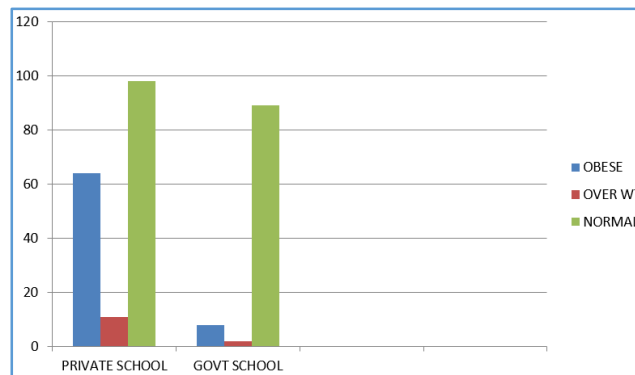
METHODS: This is a descriptive study/cross-sectional study done for a period of 1 year from June 2007 - June 2008 in government and private schools of Kannur district. Subjects of study were children between age group of 5-12 years attending selected government and private schools of Kannur districts. By using appropriate statistical methods, sample size required for estimating a prevalence of obesity was found to be 2400. Cluster sampling technique is used. From a list of all schools of Kannur District, two strata were
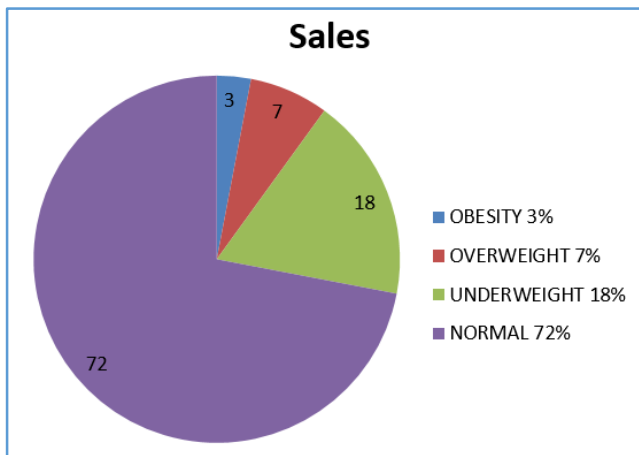
made as government schools and private schools from which three private schools and two government schools were selected using a simple random method. All children in that class were included in the study. Children between 5-12 years (from UKG to 7th) from selected class were studied. All children from selected class were included in the study. Absentees were excluded. Those who have not given parental consent were excluded. Study variables are age, sex, socioeconomic status, birth weight, blood pressure, maternal education, television viewing, monthly income of parents, government/private school and family size.
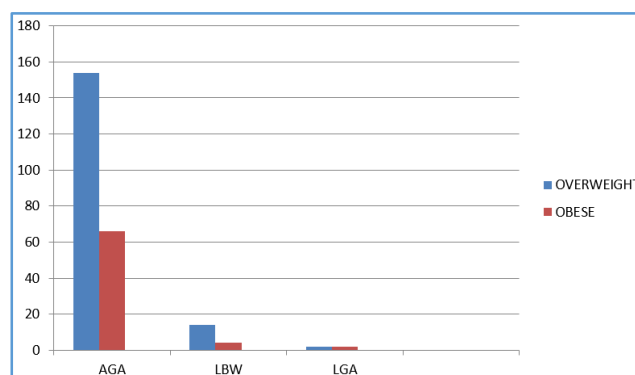
RESULTS:

Prevalence of Obesity in Study Sample

Gender Distribution of Overweight

Girls are more prone than boys to develop persistent obesity during adolescence.

X² test for overweight showed the relation of age and gender with overweight is significant (p value 0.001 and 0.041, respectively).

Distribution of Overweight and Obesity at Private and Government School

X^2 test for overweight and school showed that the relation between overweight and school is significant.
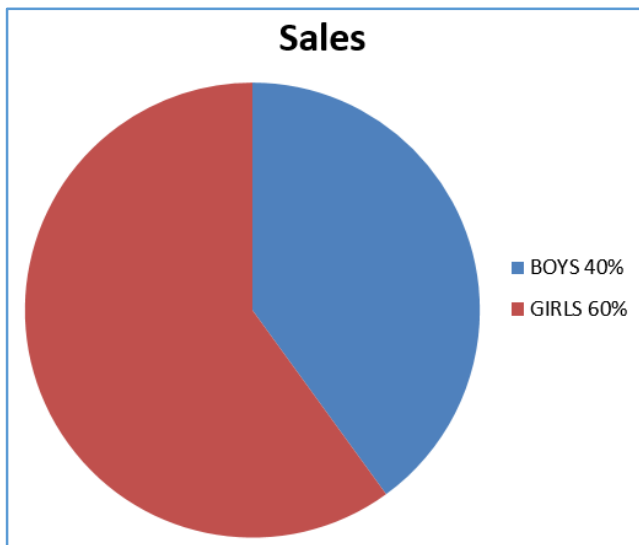

Distribution of Overweight with Birth Weight Status

X^2 test for obesity and birth weight shows that there is positive correlation between obesity and birth weight. (p value=0.042). (AGA - appropriate for gestational age. LBW - low birth weight. LGA - low for gestational age).
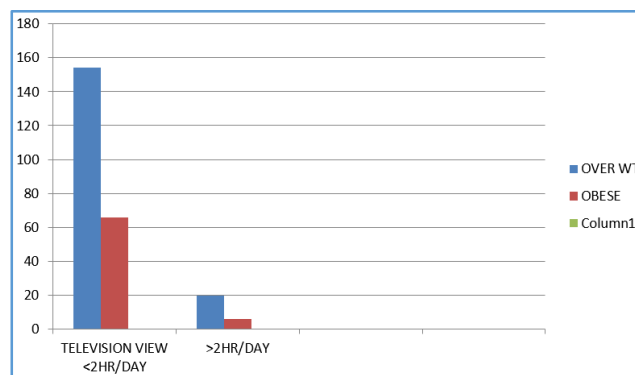
Correlation of BMI with Waist Hip Ratio:
P value for BMI >95th centile is 0.0006 (significant).
- BMI 85-95th centile is 0.0001.
- BMI 5-85th centile is 0.146.

Distribution of Overweight with Television Viewing

- X^2 test for obesity and television watching shows significant correlation p=0.022.
- X^2 test for overweight and activity shows that relation between overweight and inactivity is significant (p=0.0001).
- There was no significant correlation between maternal education and overweight in children.
- X^2 test for overweight and monthly income of parents shows significant correlation p value=0.000.
- X^2 test for overweight and blood pressure shows that relation between them are significant p value=0.001.
- X^2 test for overweight and family size shows that relation between them is significant p value=0.039.

DISCUSSION: During the past two decades, the prevalence of obesity in children has risen greatly worldwide. In the present study conducted among school children of Kannur district in the age group 5-12 years, the prevalence of obesity is 3% and overweight is 7.25%. Data obtained from National Population Survey, Preliminary 1999-2002 NHANES showed that approximately 30% of children and adolescent in United States were overweight or obese.

Calculated global prevalence of overweight in children aged 5-17 years is estimated by the International Obesity Task Force to be approximately 10%. But, this is unequally distributed with prevalence ranging from 30% in United States to <2% in Sub-Saharan Africa. Obesity is unequally distributed in the community. In our study, prevalence of overweight and obesity was found to increase with age. This association was found to be statistically significant. In longitudinal studies (The Bogalusa Study) approximately 22% of obese preschool children remain obese as adults compared to approximately 50% of obese six-year-old and 80% of obese 10-14 year old.[1]

In our study, 7.9% of girls and 6.4% boys are overweight and 3.34% girls and 2.57% boys are obese and this difference is found to be statistically significant. Girls are more prone than boys to develop persistent obesity during adolescence. This is related to changes in body composition that occur at puberty. Approximately, 80% of obese adolescent girls remain obese whereas approximately 30% of obese adolescent males do so.[2]

In the present study, prevalence of overweight and obesity in private schools was found to be 10.9% and 4.5% respectively and that of government school was 2% and 0.8%, respectively. This difference in the prevalence of overweight and obesity at two school levels was found to be statistically significant. This difference in the prevalence might be because most of the students coming from upper and middle class families attended private schools. This unequal distribution of obesity in the community is fairly evident in recently conducted urban studies.

In India, there is a tremendous urban/rural/rich/poor divide. Prevalence among urban rich being much higher than rural areas and poor communities. Ramachandran et al studied children from six schools in Chennai.[3] The prevalence of overweight adolescence ranged from 22% in better off schools to 4.5% in lower income group schools.

In our study, students coming from families with 2 or less than 2 children, overweight was prevalent in 8.02% whereas in students coming from families with more than 2 children only, 4.46% were overweight. This difference is found to be statistically significant. In case of obesity between the two groups of students, there was no statistical significant difference.

A number of studies have shown that higher birth weight is positively related to subsequent fatness, but higher prevalence of obesity is also seen in lower birth weights with a U or J shaped relationship.[4] In the present study, overweight and obesity was positively related to high birth weight. Among large for gestational age babies, 25% were overweight and 8.3% were obese. Among appropriate for gestational age babies, 7.96% were overweight and only 3.4% were obese among low birth weight babies, 16% were overweight and 9% were obese and this was found to be statistically significant.

A lifestyle characterised by lack of physical activity and excessive inactivity particularly television viewing might cause obesity in children. Among children from Mexico City, obesity risk decreased by 10% for each hour of moderate-to-vigorous physical activity.[5] In the present study, the association of overweight and obesity with various levels of activity showed that overweight was seen in 11.53%, 8.52% and 0% of those children pursuing light, moderate and vigorous activity, respectively. This difference is found to be statistically significant. So, overweight and obesity are positively associated with inactivity.

The effect of television viewing on increased incidence of obesity is of particular interest. Television viewing is thought to promote weight gain not only by displacing physical activity, but also by increasing energy intake.[6,7] Children seem to passively consume excessive amount of energy dense foods while watching television. In our study, data showed none had the habit of eating during television viewing. Furthermore, television advertising could adversely affect dietary pattern. In our study, prevalence of overweight in children viewing television for less than 2 hours a day is 2.9% while 4.2% of children viewing television for more than 2 hours a day are overweight and this difference is statistically significant. Similar findings were seen in Mexico study.[6]

In our study, association of overweight and obesity with maternal education was found not very significant. Association between monthly income of parents and overweight was found to be significant. Several large epidemiological studies have documented linear relationship between hypertension and BMI.[7,8] Longitudinal assessment of participants in the Framingham study found that blood pressure increased by 6.5 mmHg for every 10% increase in body weight. Approximately, 20-30% of obese children have elevated blood pressure compared to controls. In our study, 11% of obese children and 13.7% of overweight children were found to have elevated blood pressure.

Adult with central obesity are at increased risk for heart disease, diabetes, hypertension and some forms of cancer. In our study, correlation between BMI and waist hip ratio

showed that BMI is positively correlated with obesity and overweight, but with normal and underweight, this correlation is not statistically significant.

CONCLUSION:

- Prevalence of obesity in study sample is 3%, overweight 7.25%, normal weight 71.75%, underweight 18%.
- Girls are more prone than boys to develop persistent obesity during adolescence.
- X^2 test for overweight showed the relation of age and gender with overweight is significant (p value 0.001 and 0.041, respectively).
- X^2 test for overweight and school showed that the relation between overweight and school is significant.
- X^2 test for obesity and birth weight shows that there is positive correlation between obesity and birth weight (p value=0.042). (AGA-appropriate for gestational age. LBW - low birth weight. LGA - low for gestational age).
- X^2 test for obesity and television watching shows no significant correlation.
- Similarly, there was no significant correlation between maternal education and overweight in children.
- X^2 test for overweight and monthly income of parents shows significant correlation, p value=0.000.
- X^2 test for overweight and blood pressure shows that relation between them are significant p value=0.001.
- X^2 test for overweight and family size shows that relation between them is significant p value=0.039.

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