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RESEARCH ARTICLE

TO STUDY CORRELATION OF INSULIN RESISTANCE WITH PHYSICAL ACTIVITY IN CHILDREN / ADOLESCENTS

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Key words:-

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Abstract

Objective: IR is a pathological condition strongly associated with obesity and involved in the pathogenesis of T2D. The treatment of insulin resistant children is firstly targeted to lifestyle interventions. Homeostasis model assessment of insulin resistance (HOMA-IR) may be useful for early evaluation of insulin resistance in children and teenagers and could have a long-term benefit of preventive and diagnostic therapeutic intervention.

Method: A cross-sectional study was performed on 80 children and adolescents' age 5 to 14 years, 40 of them were apparently healthy with Body mass index (BMI) < 85th percentile 16 were overweight with BMI > 85th percentile and below 95th percentile 24 were obese with > 95th percentile. Physical activity was classified on basis of WHO guidelines. Out of 80 children 33 were active and 47 were less active. After overnight fasting for 8 hr, blood samples were taken serum insulin and fasting blood glucose were analysed. Insulin resistance was assessed by homeostasis model of assessment.

Result and Conclusion: Our results revealed altered values of HOMA-IR in children with high BMI and mean values were high in children with decrease physical activity. We concluded that more studies should be conducted to focus on preventing and identifying risk factors in children.

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Introduction:-

There is increase in physical inactivity among children and youth in India.¹ Insulin resistance (IR) is a pathological condition strongly associated with obesity and involved in the pathogenesis of Type-2 Diabetes. The treatment of IR in children is firstly targeted to lifestyle interventions.² HOMA-IR (homeostasis model of assessment) may be useful for early evaluation of IR in children and teenagers and could have a long-term benefit of preventive and diagnostic therapeutic intervention.³ According to 2018 Indian report card Children and youth aged 5 to 17 years should do at least 60 minutes daily of moderate-to-vigorous-intensity physical activity from brisk walk to running and should be aerobic. When possible, at least 3 times per week vigorous intensity activities should be incorporated, including activities that strengthen muscle and bone.

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Material and Methods:-

The present cross sectional study was conducted in the Department of Biochemistry in collaboration with Department of Paediatrics, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences. Patients in the age group of 5 to 14 years attending outpatient department of paediatrics were enrolled. **Total 80** children in the age group of 5 to 14 years attending outpatient department of paediatrics were enrolled, 40 of which were apparently healthy.

Children with any systemic disease like hypertension, renal disease, cardiovascular disease, endocrinal disorders, local or systemic steroids, on sex hormones and growth hormone or on any type of pharmacological therapy for obesity and any major illness like liver disease, cancer, psychiatric illness or neuronal developmental delay were excluded from the study.

After taking the history and informed consent from the study participants and their guardian/parents blood samples were taken after overnight fasting of 8 hours. Physical activity was classified on basis of WHO guidelines. Serum insulin and fasting blood glucose levels were analysed. Insulin resistance was assessed by homeostasis model of assessment.⁴

Result:-

After collecting the samples, data was entered into master chart and appropriate statistical test were applied. Of the total 80 children, 40 of them were apparently healthy with Body mass index (BMI) < 85th percentile, 16 were overweight with BMI >85th percentile and below 95th percentile and 24 were obese with > 95th percentile. These were compared with the physical activity.

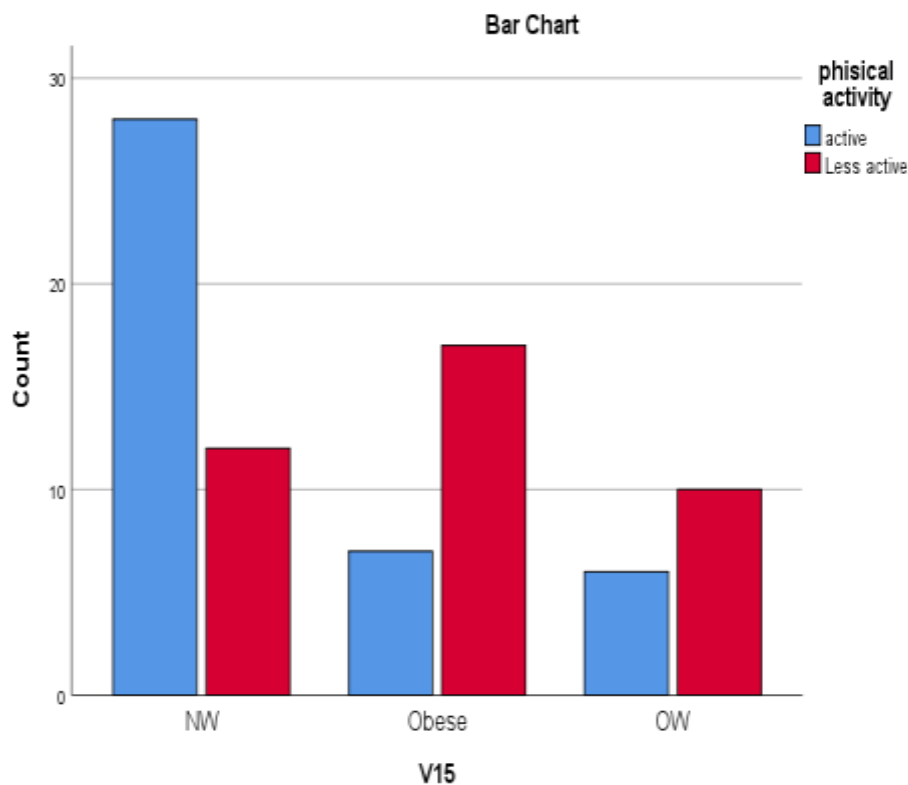


Figure 1:- Showing activity among children.

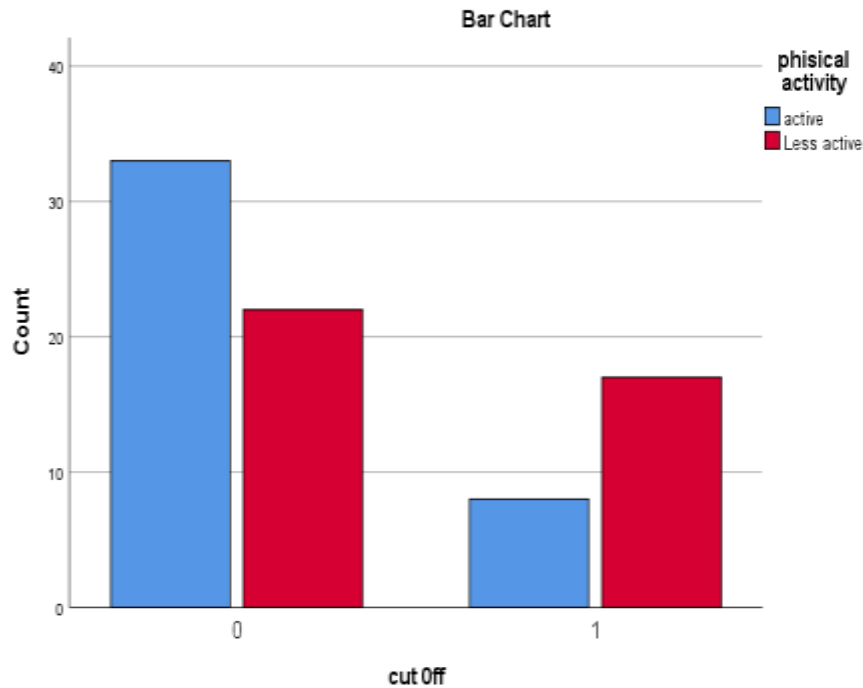


Figure 2:- Children with physical activity and IR.

Table 1:-Mean values of HOMA-IR.

	Physically active	Physically inactive
Mean HOMA-IR	1.96 ± 2.28	2.83 ± 3.02

The mean values of HOMA-IR were significantly higher in physically inactive children than the physically active children. T test value was found significant ($p < 0.05$) between BMI and Physical activity. Statistically significant association ($p < 0.05$) between BMI and HOMA-IR was found.

Discussion:-

Esht et al (2017) conducted a study among 234 rural children and youth in north India aged between 8-14 years showed that approximately 45% of children and youth met physical activity guidelines. One common pattern that emerged from both urban and rural data was that girls were significantly less active compared to boys.⁵

In a study it was found that the association between Physical Activity and body mass index (BMI) was weak in non-obese individuals. In contrast, BMI was highly significantly associated with Physical Activity in obese individuals.¹

Physical Activity was significantly correlated with fasting insulin and insulin sensitivity, more strongly in children with above-median systolic blood pressure.⁶

Conclusion:-

Our study concluded that due to decrease physical activity in children and adolescents there is increase in the level of insulin resistance. So, imparting balanced life style including physical activities among children and adolescents may decrease the risk of developing metabolic syndrome or non-communicable diseases in early phases of life.

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- <2.5 >2.5
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