

## Risk of Childhood Obesity in Children with High Birth Weight in a Rural Cohort of Northern India

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### Abstract:

**Background:** To assess the risk of Childhood Obesity in Children with High Birth Weight in a Rural Cohort of Northern India. **Materials & methods:** A total of 100 children with high birth weight were enrolled in the present study. Another set of 100 children with birth weight within normal limits were enrolled as control group. Children with birth weight of more than 3500 gm were regarded as belonging to high birth weight group. Complete demographic and clinical details of all the subjects was obtained. Anthropometric details of all the subjects were also recorded. A Performa was made for evaluating the socio-economic details of all the subjects. All the results were summarized in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. **Results:** Indoor playing was seen in 81 patients of high birth weight group and 88 patients of control group respectively. Outdoor playing was seen in 99 patients of high birth weight group and 100 patients of control group respectively. Physical activity daily was seen in 61 patients of high birth weight group and 78 patients of control group respectively. Daily time of physical activity was 146.6 minutes and 161.7 minutes among patients of high birth weight group and control group respectively. Daily time of physical activity was a significant risk factor of childhood obesity. **Conclusion:** If society focuses on the causes, it may be possible to slow the growth of the childhood obesity problem. There are numerous factors that contribute to childhood obesity, some of which are more important than others.

**Key words:** Obesity, Childhood, Birth weight, Rural

### Introduction

Obesity is a complex, pervasive, and frequently persistent health problem in children and adolescents. Obesity is defined as having a Body Mass Index (BMI) greater than or equal to the 95th percentile for age and gender in children aged two years and older. Severe obesity is having a BMI greater than or equal to the 120th percentile. For younger children, the Centers for Disease Control (CDC) recommend using the World Health Organization weight-for-length age and gender-specific charts rather than the BMI.<sup>1, 2</sup> Childhood OW/OB is determined by the child's height and weight to calculate body mass index (BMI), which is adjusted according to norms based on the child's age and gender. BMI between the 85th and 94th percentile is in the "overweight" range, whereas BMI  $\geq$  95th percentile for age and gender is in the "obese" range. Rates of obesity among children and adolescents in developed countries worldwide, collected in 2013, were 12.9% for boys and 13.4% for girls.<sup>3, 4</sup>

It is widely accepted that increase in obesity results from an imbalance between energy intake and expenditure, with an increase in positive energy balance being closely associated with the lifestyle adopted and the dietary intake preferences. However, there is increasing evidence indicating that an individual's genetic background is important in determining obesity risk. Research has made important contributions to understanding of the factors associated with obesity.<sup>5</sup> Hence; the present study was conducted for evaluating the risk of Childhood Obesity in Children with High Birth Weight in a Rural Cohort of Northern India.

### Materials & methods

The present study was carried out with the aim of assessing the risk of Childhood Obesity in Children with High Birth Weight in a Rural Cohort of Northern India. A total of 100 children with high birth weight were enrolled in the present study. Another set of 100 children with birth weight within normal limits were enrolled as control group. Children with birth weight of more than 3500 gm

were regarded as belonging to high birth weight group. Complete demographic and clinical details of all the subjects was obtained. Anthropometric details of all the subjects were also recorded. A Performa was made for evaluating the socio-economic details of all the subjects. All the results were summarized in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

## Results

Mean age of the subjects of the high birth weight group and control group was 7.9 years and 8.8 years respectively. Majority of the subjects of both the

study groups belonged to the middle class of socio-economic status. Indoor playing was seen in 81 patients of high birth weight group and 88 patients of control group respectively. Outdoor playing was seen in 99 patients of high birth weight group and 100 patients of control group respectively. Physical activity daily was seen in 61 patients of high birth weight group and 78 patients of control group respectively. Daily time of physical activity was 146.6 minutes and 161.7 minutes among patients of high birth weight group and control group respectively. Daily time of physical activity was a significant risk factor of childhood obesity.

**Table 1: General variables**

Variable		High birth weight group	Control group	p-value
Age of child (years)		7.9	8.8	0.00 (S)
Socio-economic status	Upper middle	18	15	0.762
	Middle	76	81	
	Lower middle	6	3	
School going		99	98	0.331

S: Significant

**Table 2: Physical activity**

Physical activity	High birth weight group	Control group	p-value
Indoor playing	81	88	0.646
Outdoor playing	99	100	0.912
Physical activity daily	61	78	0.001(S)
Daily time of physical activity (mins)	146.6	161.7	0.000(S)

S: Significant

## Discussion

The term overweight refers to excess body weight for a particular height whereas the term obesity is used to define excess body fat. Overweight and obesity primarily happen either due to excess calorie intake or insufficient physical activity or both. Furthermore, various genetic, behavioural, and environmental factors play a role in its pathogenesis. Childhood obesity is a forerunner of metabolic

syndrome, poor physical health, mental disorders, respiratory problems and glucose intolerance, all of which can track into adulthood. Developing countries like India have a unique problem of 'double burden' wherein at one end of the spectrum we have obesity in children and adolescents while at the other end we have malnutrition and underweight.<sup>6- 8</sup> Hence; the present study was conducted for evaluating the risk of Childhood Obesity in Children with High Birth Weight in a Rural Cohort of Northern India.

Mean age of the subjects of the high birth weight group and control group was 7.9 years and 8.8 years respectively. Majority of the subjects of both the study groups belonged to the middle class of socio-economic status. Indoor playing was seen in 81 patients of high birth weight group and 88 patients of control group respectively. Outdoor playing was seen in 99 patients of high birth weight group and 100 patients of control group respectively. Physical activity daily was seen in 61 patients of high birth weight group and 78 patients of control group respectively. Valecha, Divya et al, in a previous study, assessed the association of birth weight with CVD risk factors. A cohort of 243 babies born in 1992–1993 in ten villages of Raipur Rani Block in India, were followed-up in 2016–2017. WHO STEPS methods were used to assess the risk factors of CVDs. A total of 213 (87.8%) participants were examined; blood samples were collected from 207. Multivariable regression analysis was done to adjust for the confounding variables. Study participants were 22–24 year old, 27.7% were exposed to tobacco and 24.8% consumed alcohol, 3.3% were taking >5 servings of fruits and vegetables per day, 35.7% were physically inactive, 28.6% were overweight, 12.2% had hypertension, 16% had high cholesterol ( $\geq 200$  mg/dl), 16.4% had insulin resistance (IR) (Homeostatic Model Assessment-IR >3), and 20.7% were born with low birth weight (<2.5 kg). Multivariable regression analysis revealed inverse relationship between birth weight and systolic blood pressure. Birth weight has inverse relationship with blood pressure. Effect of birth weight on CVDs should also be studied in future follow-ups.<sup>9</sup>

Daily time of physical activity was 146.6 minutes and 161.7 minutes among patients of high birth weight group and control group respectively. Daily time of physical activity was a significant risk factor of childhood obesity. Ranjani, Harish et al reviewed the data on trends in childhood overweight and obesity reported from India during 1981 to 2013. Literature search was done in various scientific public domains from the last three decades using key words such as childhood and adolescent obesity, overweight, prevalence, trends, etc. Additional studies were also identified through cross-references and websites of official agencies. Prevalence data from 52 studies conducted in 16 of the 28 States in India were included in analysis. The median value for the combined prevalence of childhood and adolescent obesity showed that it was higher in north, compared to south India. The pooled data after 2010 estimated a combined prevalence of 19.3 per cent of childhood overweight and obesity which was

a significant increase from the earlier prevalence of 16.3 per cent reported in 2001-2005. Their review showed that overweight and obesity rates in children and adolescents are increasing not just among the higher socio-economic groups but also in the lower income groups where underweight still remains a major concern.<sup>10</sup>

## Conclusion

If society focuses on the causes, it may be possible to slow the growth of the childhood obesity problem. There are numerous factors that contribute to childhood obesity, some of which are more important than others.

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