

Comparative Study on Resting Heart Rate, Vital Capacity and Peak Expiratory Flow Rate between Rural Students of West Bengal and Western Uttar Pradesh

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Abstract-The aim of the study was to compare the resting heart rate (RHR), vital capacity (VC) and peak expiratory flow rate (PEFR) between rural students of West Bengal and Western Uttar Pradesh. 60 rural school students of West Bengal state (W.B) and 60 rural school students of Western Uttar Pradesh state (W.U.P) were randomly selected. The RHR was measured by using manual process, VC and PEFR were measured by Wet Spirometer and Wrights Mini Peak Flow Meter. T-test was used to find out the significant of the study and level of significant was set at $p < 0.05$. The anthropometric characteristics height, weight and BMI of subjects were assessed, that indicates W.U.P. school student was taller than W.B. school boys, and BMI was not significantly difference between them. The result of the study indicates RHR was not significantly difference and VC and PEFR were significantly difference between school boys of W.B and W.U.P.

Keywords: Rural Area, School Boys, Resting Heart Rate, Vital Capacity, Peak Expiratory Flow Rate, West Bengal, Western Uttar Pradesh.

1. INTRODUCTION

The lifestyle is the key of health status. The healthy lifestyle itself refers, free from sedentary lifestyle and hypokinetics diseases. Till now in India most of rural people socio-economic status dependent on agricultural activities. The rural children have better anthropometric and body composition status and higher physical fitness capacity in related to urban children [1-3]. In modern era the Obesity and COPD (Chronic Obstacle Pulmonary Disorder) are the most challenging diseases among individual of all ages. Day by day our daily life becomes more narrative, this trends also covered in childhood life. The high level of air pollution is the causes of various lungs disorders. It has no doubt that the rural environment or air pollution till now has pleasant, comparatively than metropolitan. In India, rural children has higher lungs capacity rather than urban [5]. The factor like altitudinal difference changes the human lungs capacity among people of all stages [6,7].

Objective of the study

To compare the resting heart rate, vital capacity and peak expiratory flow rate between rural students of West Bengal and Western Uttar Pradesh.

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2. METHODOLOGY

2.1 Subjects

Sixty (60) school boys of Tantulmuri Mahammad M MSK in Tentulmuri, Kharagpur - II block, Paschim Medinipur district, in West Bengal state (W.B) and sixty (60) school boys of St. Marys Inter College in Rataul, Khekra block, Baghpat district in Western Uttar Pradesh state (W.U.P) were randomly included in this study. The subject's age ranged from 12 to 16 years (Class 6th -8th standard). The selected areas of West Bengal and Western Uttar Pradesh were being located at remote rural area in India.

2.2 Measurement

To measure the resting heart rate (RHR), vital capacity (VC) and peak expiratory flow rate (PEFR) following methods were used.

Resting Heart Rate

The heart beat/minute (bpm) was counted over the carotid artery after 30 minute full rest. The one minute duration was determined by stopwatch.

Vital Capacity

Vital Capacity was measured by Wet Spirometer. This instrument was 6 liter container, filled with water upto 1 inch from the top and was counter balanced by a chain, which passed over free running pulley. It was placed on a table. The participant took deep breath as much as possible, then he placed the mouth piece in between his lips and breathed out gradually and consistently until the most extreme volume of air was ousted, without taking another breath. During breath out it was confirm that the exhaled air not escape through the nose and other sides. Dial of the spirometer was followed to record the data, within three appropriate trails highest score was recorded in milliliter (ml),

Peak Expiratory Flow Rate

Peak Expiratory Flow Rate was measured by Wrights Mini Peak Flow Meter. The participant was held the instrument in his hands and the mouth pieces was properly placed in between his lips followed by deep breath as possible. Then breath out forcefully within the mouth piece after maximum inhalation. During breath out it was confirm that the air not escape through the nose and other sides. Within three appropriate trails highest score was recorded in litre/minute (l/min).

Anthropometric Variables

The weight in kg was measured by a standard weight machine, with subject's shoes removed and wore minimum clothes. The height in mt was measured by stadiometer, with subject's shoes removed and feet and the buttocks attached together, then upper back and back of the head makes firm attached against the stadiometer. Body Mass Index was measured by using the formula $\text{Weight (Kg)} / \text{Height (mt)}^2$.

2.3 Statistical Analysis

The independent t-test was used to analyze the data and level of significant was set at $P < 0.05$. The software Microsoft Office Excel was used to calculate the data.

3. RESULT & DISCUSSION

The W.U.P. school boys were taller ($t = 6.07$, $p = 0.00$) than the W.B school boys and their weight was not significantly difference ($t = 1.17$, $p = 0.24$). The body mass was also not significantly difference ($t = 1.10$, $p = 0.27$) between them. Their Anthropometric characteristics was shown in table – 1. The statistical implication and result of resting heart rate (RHR), vital capacity (VC) and peak expiratory flow rate (PEFR) was shown in table-2.

Table – 1

Comparison of Anthropometric Characteristics between School Boys of W.B. & W.U.P.

Variable	W.B (n=60)		W.U.P (n=60)		T-value	P-value
	Mean	SD	Mean	SD		
Height (mt)	1.45	0.06	1.47	0.05	6.07	0.00
Weight (kg)	41.95	7.19	43.32	6.27	1.17	0.24
BMI (kg/mt ²)	19.66	2.10	20.00	1.80	1.10	0.27

Abbreviation- W.B = West Bengal School Boys, W.U.P. = Western Uttar Pradesh School Boys

Table -2

Comparison of RHR, VC, PEFR between School Boys of W.B. and W.U.P.

Variable s	W.B. (n=60)		W.U.P. (n=60)		T-value	P-value
	Mean	SD	Mean	SD		
RHR	75.58	5.29	74.33	2.52	1.58	0.11
VC	2466.66	459.05	2618.33	339.73	2.05	0.04
PEFR	262.83	53.75	244.5	40.56	2.10	0.03

Abbreviation- W.B = West Bengal School Boys, W.U.P. = Western Uttar Pradesh School Boys

The table – 2 has shown the comparison the RHR, VC and PEFR between school boys of W.B. and W.U.P. The W.B school boys mean values of RHR was 75.58 bpm, VC was 2466.66 ml, PEFR was 262.83 l/min. The W.U.P school boys mean values of RHR was 74.33 bpm, VC was 2618.33 ml, PEFR was 244.5 l/min. There t-values were 1.58, 2.05 and 2.10 respectively. The p-value of RHR (0.11) represents not significant at $p < 0.05$ and p-values of VC (0.04) and PEFR (0.03) represents significantly difference at $p < 0.05$. The result of the study indicates that RHR was not significantly different, the VC and PEFR were significantly difference between the school boys of W.B and W.U.P. Generally normal people physiological capacity depends on so many factors likes generation, lifestyle, environment, altitudinal difference etc. The both selected regions of the study were remote rural area but the Khekra block of W.U.P. near about 196 mt elevate form Kharagpur block of W.B. The Khekra block, in W.U.P. is almost 45 km away from Delhi. The air pollution is a major issue of chronic obstacle pulmonary disorder that present in this region. This study also same as the previous study of Mungriph NK et al, where they were found the lungs function was better in hilly regions peoples [8]. The study of Gupta S et al. Indicated that the healthy boy students of high altitude were higher peak expiratory flow rate than the students of lower altitude [9] and the study of Chatterjee P et al, found that the different air polluted contains within 3 km brings difference pulmonary function among adults [10].

4. CONCLUSION

The result of the study conclude that

1. The resting heart rate was not significantly difference between the rural students of West Bengal and Western Uttar Pradesh.
2. The vital capacity was significantly higher among the rural students of Western Uttar Pradesh.
3. The peak expiratory flow rate was significantly higher among the rural students of West Bengal.

The study suggested for same type of study on large sample and also suggested for further study of comparison between different latitude and air pollution on lungs function among different age group people.

5. REFERENCES

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