



**STUDY OF BASAL PHYSIOLOGICAL PARAMETERS OF
STANDARD X STUDENTS OF DHULE CITY**

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ABSTRACT

Today few literatures are available regarding normative data of the basal physiological parameters for Indian population. So the present study is undertaken to study the basal physiological parameters of standard X students. We performed an observational study in 70 students of standard X. Various parameters were measured in these students namely: body mass index (BMI), % Body fat, basal blood pressure, heart rate, sympathetic activity test like cold pressure test & parasympathetic activity tests like lying to standing test and various pulmonary function test parameters. Values of all anthropometric, cardiovascular and respiratory parameters were within normal ranges for particular age groups when compared to standard western references. As basal physiological parameters are subjected to variation by age, sex, race, genetic factor etc, values obtained from our study can be considered as normal reference values for the Indian population.

KEYWORDS: Basal physiological parameters, normative data, stress.



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INTRODUCTION

Basal Physiological parameters of human being are widely affected by age, sex, environmental temperature, humidity, altitude, genetic factor etc.¹ Also students of X standard are exposed to stress in studies for the first time.² Keeping both these things in mind we thought it would be interesting to know the actual values of the physiological parameters like body mass index (BMI), % Body fat, basal blood pressure, heart rate, sympathetic activity test like cold pressure

test & parasympathetic activity tests like lying to standing test and various pulmonary function tests in school children. Relatively little literature is available regarding normative data of the Indian population for various physiological parameters.³ Hence the present study is undertaken to generate the normative data for the Indian population of various age groups and also to study whether stress is responsible for changes in various physiological parameters in school children.

MATERIALS AND METHODS

70 Students of standard X were included in this study. They were categorized in three groups.

Group I	Subjects in the age group of 13 - 14 years.
Group II	Subjects in the age group of 14 - 15 years.
Group III	Subjects in the age group of 15 - 16 years.

A detail history was taken regarding exercise, diet and habits. Subjects history of recent/remote cardiorespiratory diseases like congestive cardiac failure, respiratory allergy, emphysema, tuberculosis, history of tobacco use, smoking, alcohol intake, those with physical disability capable of affecting lung function like kyphoscoliosis were excluded from the study. Informed & written consent of all students was taken.

Parameters studied were

- Anthropometric measurements – Height, Weight, BMI. ⁴
- Percentage body Fat – Using skin fold thickness Vernier Caliper. ^{5, 6}
- Basal Heart Rate – after 30 minutes of complete bed rest by routine pulse rate / min. ⁷
- Basal B. P. – using mercury sphygmomanometer. ⁸
- **Autonomic function tests**
 - Sympathetic function test – by cold pressor test. ^{9, 10}
 - Parasympathetic Function Test – using ECG by determining heart rate at 30th beat and 15th beat and then taking 30/15th ratio, also a ratio of heart rate during inspiration and expiration was taken. ¹¹
- Respiratory function tests forced vital capacity (FVC), forced expiratory volume in 1st second (FEV1), peak expiratory flow rate (PEFR), maximum voluntary ventilation (MVV). like using electronic Medspiror machine. ^{12, 13}

Equipments Used were

- ✚ Measuring Tape
- ✚ Weighting Machine
- ✚ Medspiror
- ✚ Fat – O Meter
- ✚ ECG Machine
- ✚ Mercury Sphygmomanometer.
- ✚ Ice cold water

OBSERVATIONS & RESULTS

Age Group	Anthropometric parameters (mean \pm S.D.)		Cardiovascular Parameters (mean \pm S.D.)								Respiratory Parameters (mean \pm S.D.)			
	Fat %	BMI	Heart rate Supine	Heart rate standing	B.P. Systolic (mm Hg)	B.P. Diastolic (mm Hg)	CPT Systolic (mm Hg)	CPT Diastolic (mm Hg)	PNS 30/15 ratio	PNS Inspiration Expiration ratio	FVC (liters)	FEV-1 (liters)	PEFR (liters/minute)	MVV (liters/minute)
Group I (n=19)	9.6 8+ 5	15.4 1+ 2.46	79.09 +7	87.91 +8.47	105.4 5+ 7.06	67.9 + 7.16	17.09 + 9.08	16.3 6+ 9.25	1.30 + 0.20	1.48 + 0.21	2.1 + 0.4 6	1.9 3+ 0.5 7	4.95 + 0.82	83.0 7+ 18.6 2
Group II (n=32)	8.6 +3	15.9 1+ 2.6	75.34 + 6.25	88.69 +7.88	107.6 8+ 8.84	67.1 8+ 9.93	18.19 + 7.84	17.6 3+ 9.84	1.33 + 0.16	1.42 + 0.12	2.1 + 0.4 8	1.9 8+ 0.4 6	4.79+ 1.38	81.4 3+ 24.1
Group III (n=19)	8.4 4+ 2.2 2	15.9 2+ 1.19	77.11 + 6.33	94+ 7.21	107.5 6+ 6.69	68.4 4+ 13.4 8	18.67 + 12.57	17.7 8+ 4.84	1.35 + 0.14	1.44 + 1.14	2.7 + 0.4 5	2.5 6+ 0.5 4	5.44 + 0.93	111. 43+ 21.4 1

- Mean and Standard deviation of all the parameters are given in observation table. All values are within normal limit.

DISCUSSION

In the present study, 70 students of standard X were examined for various basal physiological parameters namely: Body mass index (BMI), body fat %, heart rate - supine & standing, blood pressure - systolic & diastolic, sympathetic & parasympathetic function test parameters, and various respiratory parameters like forced vital capacity (FVC), forced expiratory volume in 1st second (FEV1), peak expiratory flow rate (PEFR), maximum voluntary ventilation (MVV). Mean and standard deviation of all the parameters were noted. All values are within normal limit. Standard references available today denote values obtained mostly from western population.¹⁴ Indian population differs in nutritional status, socio-economic status, environmental factor, type of food consumed, nature of work, etc. Hence standard values do not represent the

Indian population truly.¹⁵ Also tenth std. is the first exposure to stress during academic progress.² The subjects included in study were apparently healthy and free from any diseases condition. Hence the mean values obtained from the present study can be considered as normal values for the various age group studied.

CONCLUSION AND SUMMARY

In the present study, the mean values of various cardiovascular and respiratory parameters studied in tenth standard students were noted and were found within the normal limits for that age. This is an ongoing project and we are planning to test these parameters in all schools of our city. So that reference values truly representative of the Indian population can be obtained.

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