Original Research Article

A study of cardiovascular parameters in males and females at rest

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Abstract

Background: Heart Rate Variability (HRV) is considered a good indicator of autonomic control related to cardiovascular health, and has been studied in a range of situations in order to determine the variables that influence it. **Aims and Objectives:** To study Cardiovascular parameters in Males and Females at Rest. **Methodology:** The present study was carried out in 60 normal healthy males and 60 normal healthy females between the age group of 19 and 20 years. The normal subjects were selected among the students of nursing college of S.R.T.R. medical college, Ambajogai and T.B.G. College of polytechnic, Ambajogai, with no special reference to their physical training. Parameters which were compared in same sex (Such as females or males) for before and after the exercise, the paired 't' test is applied. **Results:** Significantly more heart rate was in females than males. Systolic and diastolic blood pressures are very highly significantly and highly significant respectively more in males than females. Cardiac work is significantly more in females than males. **Conclusion :** It can be concluded from our study that high resting heart rate, Cardiac work was found in Females while Systolic and diastolic blood pressures more in males than females respectively.
Key Words: Heart Rate Variability (HRV), Heart rate (HR), Systolic and Diastolic blood pressure (SBP, DBP).

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INTRODUCTION

Heart Rate Variability (HRV) is considered a good indicator of autonomic control related to cardiovascular health, and has been studied in a range of situations in order to determine the variables that influence it. The most widely-reported influential variables are: age[1-6], gender[5-8], heart disease[9], neurological disease[10-12] and exercise [6,9,13-14]. HRV is known to decrease when sympathetic activity predominates, whereas it increases when parasympathetic activity predominates. HRV thus reflects autonomic control of the cardiovascular system[16]

MATERIAL AND METHODS

The present study was carried out in 60 normal healthy males and 60 normal healthy females between the age group of 19 and 20 years. The normal subjects were selected among the students of nursing college of S.R.T.R. medical college, Ambajogai and T.B.G. college of polytechnic, Ambajogai, with no special reference to their physical training. Physical examination of all the subjects before the start of the procedure was done with the help of proforma. We have excluded the cases with pulmonary, cardiovascular disorders or other illness. All the selected female subjects were studied in the provulatry phase of the menstrual cycle. All the subjects were studied between timing of 11 am to 2 pm. Once the volunteer was found to be acceptable by the above criteria, the experimental protocol was carefully explained to the subjects and the subjects was asked to take part in the experiment and on agreeing was required to sign a form or informed consent. Only one individual declined to participate at that point. Apparatus: Handgrip dynamometer, well calliberated ECG machine, weight machine, sphygmomanometer, stethoscope, measuring tape. With the help of handgrip exercise we have studied

the following parameters in all selected subjects- Systolic blood pressure (mmHg), Diastolic blood pressure (mmHg), Cardiac work (Arbitrary units). Cardiac work 12: Cardiac work is calculated as the product of heart rate and mean blood pressure as follows-Cardiac work= heart rate X Mean Blood pressure

= Heart rate X (DBP+1/3 (pulse pressure)

= Heart rate X [DBP+1/3 (Syst. BP-Diast. BP)]

Similarly, cardiac work was calculated immediately after the exercise by taking values of after the handgrip exercise.

All the above parameters, heart rate, blood pressure and cardiac work were measured before and immediately after the handgrip exercise and were compared in the males and female volunteer group by applying the two tests i.e. unpaired 't' test [16] for the parameters which were compared in males and females. Parameters which were compared in same sex (Such as females or males) for before and after the exercise, the paired 't' test is applied[16]

RESULT

Table 1: Distribution of the patients as per the baseline characters

Baseline characters	Mean
Mean age	
Males	19.5 years
Females	19.5 years
Mean Height	
Males	165.57 cms
Females	151.4cms
Mean body weight	
Males	55.11 kg
Females	44.08 kg.

The mean age of all the selected males is 19.5 years and of the females subjects is also 19.5 years. The mean height of all the selected males Is 165.57 cms and mean height of all the selected females is 151.4cms. the mean body weight of all the selected males is 55.11 kg and the selected female subjects is 44.08 kg.

Table 2: Comparison of heart rate, systolic blood pressure, diastolic blood pressure and cardiac work in males and females before handgrip exercise

Parameter	Male (n=60)	Female (n=60)	't' value	'p' value
Heart rate (beats/min)	65.27	75.81	1.98	P<0.05
Systolic blood pressure (mmHg)	119.03	107.53	6.61	P<0.001
Diastolic blood pressure (mmHg)	79.9	75.43	2.66	P<0.01
Cardiac work (Arbitrary units)	6058.24	6515.61	2.30	P<0.05

Shows significantly increased heart rate in females than males. Systolic and diastolic blood pressures are highly significantly more in males than females. Cardiac work is significantly more in females than males.

DISCUSSION

As indicated earlier, the Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology[18] has provided valid reference data in the time domain for the assessment of cardiovascular risk. However, it is not clear whether they can be extended to healthy young people or to other variables such as degree of exercise. In our study we have seen that significantly more heart rate was in females than males. Systolic and diastolic blood pressures are very highly significantly more in males than females. Cardiac work is significantly more in females than males. Present findings matches with Harold B. Falls, Donatelle, Rebecca J *et al*.

CONCLUSION

It can be concluded from our study that high resting heart rate, Cardiac work was found in females; while Systolic and diastolic blood pressures more in males than females respectively.

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