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Comparison of physiological status between active and sedentary persons

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Abstract
The purposes of this study were to find out the status of different physiological variables such as heart rate, blood pressure, blood sugar level etc. of active and sedentary men and to compare them between two groups of people who lead active and sedentary life style in rural area of West Bengal. 10 active and 10 sedentary men from the village of Uttar Nischinta, Purba Medinipur, West Bengal were purposively selected as the subjects for this study. Their age ranges from 60-80 years. The Variables of this study were Body weight, Standing height, Age, Heart rate, Blood pressure and Blood Sugar level. The significance of statistical difference of different variables between active and sedentary men was measured by applying statistical t-test at 0.05 level of significance. Statistical findings showed that the resting heart rate and resting Blood Sugar level of active person is significantly lower than the sedentary person. But in case of resting Blood pressure the difference was not significant.

Keywords: Active, Sedentary, Heart Rate, Blood Pressure, Blood Sugar Level

Introduction
Glucose, the most important carbohydrate fuel in the body with the other food components. In the fed state, the majority of circulating glucose comes from the diet; in the fasting state, gluconeogenesis and glycogenolysis maintain glucose concentrations. Very little glucose is found in the diet as glucose; most is found in more complex carbohydrates that are broken down to monosaccharides through the digestive process [2].

The amount of glucose in your blood changes throughout the day and night. Your levels will change depending upon when, what and how much you have eaten, and whether or not you have exercised. A normal fasting (no food for eight hours) blood sugar level is between 70 and 99 mg./dL. A normal postprandial (PP) blood sugar level (two hours after eating) is less than 140 mg./dL [4].

The rise of blood glucose in normal and diabetic subjects after meals varies markedly and depends on many factors, including the source of the carbohydrate, its method of preparation, and the composition of the total meal. Classification of carbohydrates as simple or complex does not predict their effects on blood glucose or insulin. Rapidly absorbed carbohydrates, which produce large blood glucose and insulin responses, may be in the form of both sugars and starches. Sugars added to foods have no different effect on blood glucose from those of sugars alone. The natural sugars in fruit and fruit juices raise blood glucose approximately as much as does sucrose and less than do most refined starchy carbohydrate foods. The optimum amount of sugars in the diet is not known. However, undue avoidance of sugars is not necessary for blood glucose control and is not advised because it may result in increased intakes of fat and high-glycemic-index starch [7].

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. Physical inactivity has been identified as the fourth leading risk factor for global mortality causing an estimated 3.2 million deaths globally. Regular moderate intensity physical activity – such as walking, cycling, or participating in sports – has significant benefits for health. For instance, it can reduce the risk of cardiovascular diseases, diabetes, colon and breast cancer, and depression. Moreover adequate levels of physical activity will decrease the risk of a hip or vertebral fracture and help control weight [8].

Sedentary lifestyle is a type of lifestyle with no or less physical activity; characterised by

sitting or remaining inactive for most of the day with little or no exercise. It is found in both developing and developed nations. It includes sitting, reading, watching T.V., playing video games, mobile phones, and computer use for more time with no vigorous physical activity. Lack of physical activity is a leading cause of preventable death worldwide. The risk is higher among those who sit still for more than 5 hours per day. There are lot of studies around sedentary lifestyle and diabetes emerging and this study covers few of the aspects.

Despite considerable scientific information on physiological performance of human, there is no such information about the rural aged people who are basically earning their bread and butter from cultivation. So far, there is no comparative report on physiological variables of rural over aged people in West Bengal considering active and sedentary. Our study was therefore aimed to compare the physiological status of active and sedentary people in rural West Bengal

The purposes of this study were to find out the status of different physiological variables such as heart rate, blood pressure, blood sugar level etc. of active and sedentary men and to compare them between two groups of people who lead active and sedentary life style in rural area of West Bengal.

Methodology

Subjects

10 active and 10 sedentary Men from the village of Uttar Nischinta, Purba Medinipur, West Bengal were selected as the subjects for this study. Their age ranges from 60-80 years. The subjects were selected purposively from the villagers. The active persons still were engaged in the agricultural work for 6-8 hrs. daily. The sedentary persons were retired from service and now their livelihoods were almost fine. The socioeconomic status was not considered here although all the subjects were residing in a same locality and enjoy same environment with their moderately high economic status. The profession only changed their lifestyle.

Variables

- Personal data: - Body weight, Standing height and Age.
- Physiological Variables: - Heart rate, Blood pressure and Blood Sugar level.

The subjects were refrained from taking food or doing any kind of physical activity at least for 3 hours before taking data and they were also allowed to take a rest for a minimum period of 30 minutes so that their heart rate may come down to a steady state. Measurements were taken with minimal clothing and barefoot. Body weight were taken through weighing machine, height was measured without shoes to the nearest 0.1 cm from sole of the feet to the vertex in erect body position, with the help of a simple tape. The resting heart rate in beat/min. and blood pressure (systolic and diastolic) in mmHg were recorded by using Omron heart rate and Blood pressure monitor. Blood sugars were measured by the Akucheck glucometer.

Results and Discussion

Table no. 1: Mean, S.D. &'t' values of Heart Rate of active and sedentary person

Variables	Group	Mean± S.D.	'T'-Ratio
Heart Rate (beat/min.)	Active person	71.50 ± 6.69	3.58*
	Sedentary person	79.10 ± 6.54	

* Table value of 't' at 0.05 level of confidence = 2.26

From table 1 it was found that the obtained 't' value 3.58 is more than the table value of 2.26 with the D.F. 09 at .05 level of confidence. It was concluded that there was significant difference of heart rate between active and sedentary person. Statistical findings showed that resting heart rate of active person is lower than the resting heart rate of sedentary person.

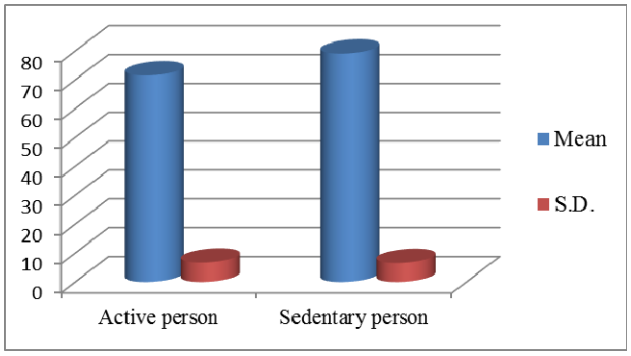

Fig 1: Graphical representation of mean, S.D. of Heart Rate of active and sedentary person.

Table 2: Mean, S.D. &'t' values of Systolic Blood Pressure of active and sedentary person.

Component	Group	Mean± S.D.	'T'-Ratio
Systolic Blood Pressure (Mm./Hg)	Active Person	134.80± 25.69	1.13*
	Sedentary Person	149.50± 22.02	

* Table value of 't' at 0.05 level of confidence = 2.26

From table 2 it was found that the obtained 't' value 1.13 is less than the table value of 2.26 with the D.F. 09 at .05 level of confidence. It was concluded that there was no significant difference of Systolic blood pressure between active and sedentary person.

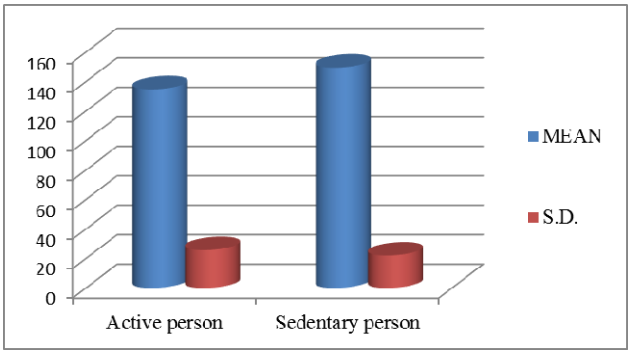

Fig 2: Graphical representation of mean, S.D. of Systolic blood pressure of active and sedentary person.

Table 3: Mean, S.D. &'t' values of Diastolic Blood Pressure of active and sedentary person.

Component	Group	Mean± S.D.	'T'-Ratio
Diastolic Blood Pressure (Mm./Hg.)	Active Person	83.50 ± 13.87	.20*
	Sedentary Person	85.10± 14.51	

* Table value of 't' at 0.05 level of confidence = 2.26

From table 3 it was found that the obtained 't' value .20 is less than the table value of 2.26 with the D.F. 09 at .05 level of confidence. Then it was concluded that there was no significant difference of Diastolic blood pressure between active and sedentary person.

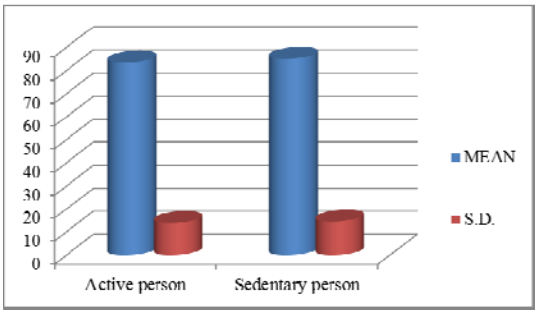

Fig. 3: Graphical representation of mean, S.D. of Diastolic blood pressure of active and sedentary person.

Table 4: Mean, S.D. &'t' values of Blood Sugar of active and sedentary person.

Component	Group	Mean± S.D.	'T'-Ratio
Blood Sugar (Mg./Dl.)	Active Person	100.40± 8.54	2.93*
	Sedentary Person	127.70± 27.66	

* Table value of 't' at 0.05 level of confidence = 2.26

From table 4 it was found that the obtained't' value 2.93 is more than the table value of 2.26 with the D.F. 09 at .05 level of confidence. It was concluded that there was significant difference of Blood Sugar between active and sedentary person and the normal blood sugar level of active person was significantly lesser than the sedentary person.

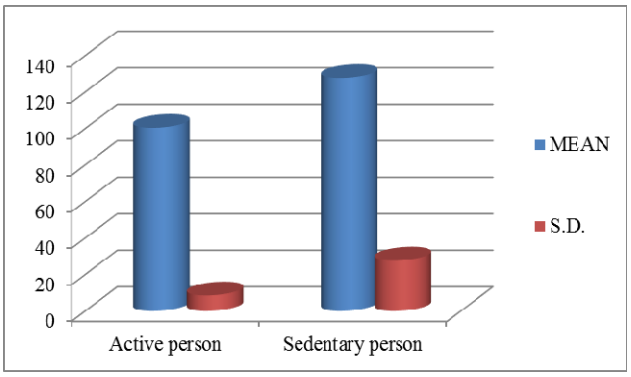

Fig 4: Graphical representation of mean, S.D. of normal blood sugar level of active and sedentary person.

Discussion

The blood glucose level was significantly lower for each exercise condition compared to rest [1]. Exercise causes profound changes in glucose homeostasis. For people with type 1 diabetes, aerobic exercise usually causes blood glucose concentration to drop rapidly, while anaerobic exercise may cause it to rise, thereby making glycemic control challenging [3]. Physical activity has a blood glucose lowering effect [5]. Moderate intensity exercise improves blood glucose, but most people fail to achieve the required exercise volume [9]. Our results are similar to what the previous workers had shown, that there exists and inverse relationship between socioeconomic status and the prevalence of diabetes [6]

Conclusions

On the basis of the result of the study, the following conclusions were drawn: -

- Resting heart rate of active person was significantly lower than the resting heart rate of sedentary person.
- Resting Systolic Blood Pressure of active person was lower than the resting Systolic Blood Pressure of sedentary person but the difference was not significant.
- Resting Diastolic Blood Pressure of active person was lower than the resting Diastolic Blood Pressure of sedentary person but the difference was not significant..
- Resting Blood Sugar level of active person was significantly lower than the resting Blood Sugar level of sedentary person.

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