Study of Association of Socio Economic Status on Cardiovascular Autonomic Function

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ABSTRACT The present study was carried out among 200 subjects of fourth grade staff and gazetted staff of Gauhati Medical College in the age group 25 to 65 years.All the 200 cases were divided into three groups upper middle class,middle class,lower class accordingto Kuppuswamy scale.After taking consent ,the following test were perfomed,for parasympathetic function(1).Deep breadth test(2).valsalva test and for sympathetic function(1)standing test for orthostatic hypotension(2).Hand grip test.The results were analysed by using student "t" test   The influence of socioeconomic status on cardiovascular autonomic function was established.There was a significant increase in hand grip test in lower socioeconomic status compared to upper middle class pvalue<.05 There was a significant decrease in valsalva ratio in lower socioeconomic status people compared to upper middle class with p value<.05 Impaired cardiovascular autonomic function was stongly associated with lower socioeconomic status and accounted for a major portion of the correlation between socioeconomic status and mortality.

INTRODUCTION-lower socioeconominic status is associated with cardiovascular morbidity   and mortality[1].The biological and behavioural mediator underlying this association are uncertain. Previous work suggest that individuals with lower socioeconomic status may have fewer option for safe outdoor exercise,purchase less healthy foods and have greater exposure to tobacco.These characteristics have potential to contribute to impaired autonomic function.The link between socioeconomic status and health is widely recognized but the pathophysiologic

mechanisms are not well understood.Inverse association of socio-economic

status and health is well established,lower socioeconomic status has been related to higher prevalence and incidence of most chronic and infectious disease as well to greater cognitive and physical disability and higher mortality[2]. Evidence demonstrates that RR interval variability from electrocardiogram provides a non-invasive index of cardiac modulation.Variability in the spectrally defined high frequency range [HF] has been linked to cardiac autonomic modulation.[3]Variability in the spectrally defined high frequency range has been linked to cardiac parasympathetic regulation employing as shown by studies employing vagal stimulation,blockade and vagotomy.

AIMS AND OBJECTIVES-The study was carried out to establish the relation of socioeconomic status with cardiovascular autonomic functions

MATERIALS AND METHOD-The study was carried among 200 staffs of Gauhati Medical College and they were divided according to Kuppuswamy scale[4] into
1.Upper middle class
2.Lower middle class
3.Lower class
The following apparatus were used to study

1Sphygmomanometer
2stethoscope
3electrocardiograph
4.physiograph

The subjects were requested to come to the department at 9am after having light

breakfast.The procedure of all the tests and purpose of doing were explained to the subjects.The subject was advised to abstain from alcohol and other bevarages on that day.After proper consent was taken ,the subject was made to lie supine on the examination bed large enough to support the entire body.So that he or she was completely relaxed.

The different test for autonomic control .For parasympathetic function the following test were perfomed[5]

1.Deep breadth test
2.Valsalva test
For sympathetic function the following test were perfomed

1.Standing test for orthostatic hypotension
2.Hand grip test
STATISTICAL ANALYSIS-Comparasion of different autonomic function tests between upper middle class , lower middle class,lower class was compared with the help of student 't'test

RESULTS
According to socioeconomic status all the 200 cases were again divided into three social class.Upper middle class,lower middle class and lower class.There were 120 cases from upper middle class,50 cases from upper middle class,30 from lower middle class .

Comparision between upper middle class and lower class showed that valsalva ratio was less in the lower class people was decreased compared to upper middle class value<.05.

But no significant difference in deep breadth test was found between upper middle class and lower class.

There was also no significant difference of orthostatic test between upper middle class and lower class.P value>.05. There was also no statistically difference in hand grip test

between upper middle class and lower class.pvalue>.05. But it was observed from the mean value that the sympathetic activity of the lower class people were more compared to that upper middle class.

DISCUSSION-According to BK Sahu,1994,people of higher socioeconomic status

Have higher rate of cardiovascular disease due to reduced parasympathetic activity and increased sympathetic activity.[7] In another study by Thomas Pickering in 2001,he found that prevalence of

Cardiovascular disease is more in people of lower socioeconomic status due to its

Reduced parasympathetic activity and increased sympathetic activity[8].This may be attributed to chronic emotional stress,difference in life style,behaviour and access to health care.

Robert S Elliot,2002 found that people of lower socioeconomic status due to its effect of difference in life style and addiction to alcohol have reduced parasympathetic activity[9]

Comparative study done with the help of ''t'' test shows that valsalva ratio in lower class people was decreased significantly in comparision to upper middle class.Pvalue<.05.

But there was no significant difference in valsalva ratio between upper Middle class and lower class

Studies done by Lehmen in 1967,Automonsky 1968 found that parasympathetic activity is less in people of higher socioeconomic status So that incidence of cardiovascular disease among people of higher class is More.[6]

In 2002 Robert S Elliot found that incidence of hypertension was higher In lower class.The possible path way by which socioeconomic status affect Cardiovascular autonomic function is chronic emotional stress and anxiety faced by the people of the lower socioeconomic status due to increase sympathetic activity.

comparative study done with the help of ''t'' test shows that valsalva ratio in

Lower class people was decreased significantly in comparision to upper middle class.Pvalue<.05.

But there was no significant difference in valsalva ratio between upper Middle class and lower class Studies done by Lehman et al in 1967 Automonsky in 1968[6] found that higher incidence of cardiovascular disease in lower socioeconomic status

It was seen from the mean value hand grip test was more in lower class people

[CONCLUSION-Impaired autonomic function and abnormal heart rate recovery were strongly associated with lower socioeconomic status and accounted for a major proportion of the corelation between socioeconomic status and mortality.The underlying mechanism linking socioeconomic status to adverse health outcome have yet to be established. Comparative study done with the help of ''t'' test shows that valsalva ratio in lower class people was decreased significantly in comparision to upper middle class.Pvalue<.05.

But there was no significant difference in valsalva ratio between upper Middle class and lower class comparative study done with the help of ''t'' test shows that valsalva ratio in Lower class people was decreased significantly in comparision to upper middle class.Pvalue<.05.

But there was no significant difference in valsalva ratio between upper middle class and lower class

There was no significant difference of deep breadth test between upper middle class and lower middle class.Pvalue>.05

There was also no significant difference of orthostatic test between upper middle class and lower class

Table-1

Comparison of Different Autonomic Function Test Between Upper Middle Class & Lower Middle Class

Test	Total no of cases 154	Upper Middle Class	Total no of cases 43	Lower Middle Class	Significance	P' value
		Mean ±SD		Mean ±SD		
Valsalva ratio	1.48±0.0709		1.45±0.083		Not Significance	>0.05
Deep breath test	20.33±6.65		18.30±4.59		Not Significance	>0.05
Orthostatic test	10.00±0.00		8.70±2.74		Not Significance	>.05
Hand grip test	18.79±4.19		21.66±2.08		Not Significance	>.05

Table-1

Comparison of Different Autonomic Function Test Between Upper Middle Class & Lower Class

Test	Total no of cases 154	Upper Middle Class	Total no of cases 3	Lower Class	Significance	P' value
		Mean ±SD		Mean ±SD		
Valsalva ratio	1.48±0.0709		1.43±0.087		Significance	<0.05
Deep breath test	20.33±6.65		17.62±4.12		Not Significance	>0.05
Orthostatic test	10.00±0.00		7.03±2.38		Not Significance	>.05
Hand grip test	18.79±4.19		21.66±2.08		Not Significance	>.05

Table-2

Comparison of Different Autonomic Function Tests Between
Lower Middle Class & Lower Class

Test	Total no of cases 43	Lower Middle Class Mean +SD	Total no of cases 3	Lower Class Mean +SD	Significance	P' value
Valsalva ratio	1.45+0.083		1.43+0.087		Not Significance	>0.05
Deep breath test	18.30+4.59		17.62+4.12		Not Significance	>0.05
Orthostatic test	8.70+2.74		7.03+2.38		Not Significance	>.05
Hand grip test	21.66+2.08		21.66+2.08		Not Significance	>.05

Table-3

Study of Different Autonomic Function Test According To Social Class

Social Class	No of cases	Valsalva test			Deep breath test (beats/ min)			Orthostatic (mm Hg)			Hand grip test (mm Hg)		
		Mean	SD	SE	Mean	SD	SE	Mean	SD	SE	Mean	SD	SE
Upper middle class	154	1.48	0.0709	(6.370)-03	20.33	6.65	0.332	10	0	0	18.79	4.19	0.337
Lower middle class	43	1.45	0.083	0.012	18.3	4.59	0.7	8.7	2.74	0.418	18.02	3.76	0.0574
Lower class	3	1.39	0.09	0.052	17.62	4.12	3.84	7.03	2.38	0.191	21.66	2.08	1.202

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