Physiological Evaluation of Cardio-Vascular Status of Traffic Policemen at Meerut, the National Capital Region

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Abstract: *Traffic police pursue a near sedentary type of work as they only stand at one place for long time or just walk a few meters only when necessity arises. Also they have to face arrogant mob, contact with criminals, accidents, loud noise daily for long time. The above mentioned factors poses a cardio vascular health hazard.(1) Study of different levels of exposure to automobile exhaust followed by repeated lipid profile for 4 years suggested that exposure to road traffic pollutants increases the risk of cardiovascular symptoms, specially blood pressure.(2)*

The heart rate of the police officers varies after getting some unavoidable or crucial news. Cardiovascular and hematological stresses are very acute in traffic officers engaged in highway patrolling.(3)

The present study aimed at evaluating the job stresses on cardiovascular profile of the police officers working in different traffic junctions of Meerut, India.

The research was carried out by assessing cardiovascular indices such as Body Mass Index (BMI), blood pressure, fasting blood sugar and total plasma cholesterol in these subjects.

At the end of the research, it was found that traffic police officers used for this study may be at risk for cardiovascular diseases.

Key words: *TP-Traffic police, CV- cardiovascular, HR- heart rate, BP -blood pressure*

I. Introduction

Traffic Police play crucial role in maintaining traffic especially in metropolitan cities. Infect without their efficient services it is next to impossible to keep the city function smoothly. At the same time it is equally true that they are subjected to related cardiovascular health hazard due to massive exposure to vehicle pollution. This fact is more important in situation as the personnel engaged in traffic duty who are exposed to occupational hazard routinely for 8 to 10 hrs per day admist the polluted working environment for years together allowing assimilating forces to act in conjunction and cause long term CV problems. . All police officers have to prepare themselves for responding efficiently and properly even for the unforeseen and unpredictable incidents. Police work has been regarded by some researchers as not only a stressful occupation but also as a factor of psychosocial stress.(4,5)

It is found that chronic occupational exposure to urban pollutants reduces resistance to physical effort and increases the risk of cardiovascular including slight hypoxemia.(6)

II. Material And Method

The present study was carried out in the department of Physiology, Mulayam Singh Medical College & Hospital. Lalpur, Meerut.

Study was conducted dividing the subject in two groups, Group A & group B.

Group A [control group] 100 normal, non smoking persons belonging to reference group & having the life style similar to that of traffic police men, engaged in work other than traffic police men, who are native of Meerut.

Group B]: [study group]: 100 non smoking traffic policemen selected randomly, working in different areas of Meerut District.

The control subjects are either working in private institutions or offices and these should be less exposed to traffic pollution

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All the subjects were males.

Exclusion criteria:
➢ Any history of angina or chest pain, diabete Melitus type II or hypertension.

Inclusion Criteria:
➢ Healthy non smoker traffic police men in the age group of 26-55 years who are working in traffic junction for more than two years are included in study.
➢ Healthy non smoker control population of the same age and sex are selected from general population and included for study .
      The subject included in both group A &B were in between 26-45 yrs of age group. study of lipid profile can give a fair idea about cardiac system specially blood pressure of an individual. Therefore the effect of vehicle pollution on the cv system can be observed even before the disease become symptomatic.

Physiological variables studied are ---
1.Body Mass Index
2..Blood Pressure
Other physiological parameters were age in years and heart rate.
Lipid profile to evaluate the cardiovascular risk factor

III.   Physiological variables

1. Body mass index (B.M.I)
Physical parameter such as height in centimeters & body weight in kilograms were measured with an anthropometric rod & a properly calibrated weighing machine respectively.
B.M.I was calculated by dividing weight in kg by the square of height in meter .
$$BMI = \frac{\text{Weight in kg}}{(\text{Height in meter})^2}$$

2. **Blood pressure –** was measured in resting condition before starting the duty ,in sitting position with the help of properly calibrated digital Sphygmomanometer of company welchallyn & stethoscope of Pacific company.

3. **Statistical Analysis-** Data were analysis using SPSS version 20. ANOVA with Post hoc tests were done in multiple comparison. All results were presented in mean + sem.

IV.   Results

      Physiological parameters were age in years and heart rate. Informed consent is taken from all the subjects those who are willing to participate in the study. Both the subject & controls were well matched with respect to age, weight, height, and body surface area (BSA)

MEAN AND STANDARD DEVIATION OF BODY SURFACE AREA AND ITS COMPARISON IN STUDY AND CONTROL SUBJECTS
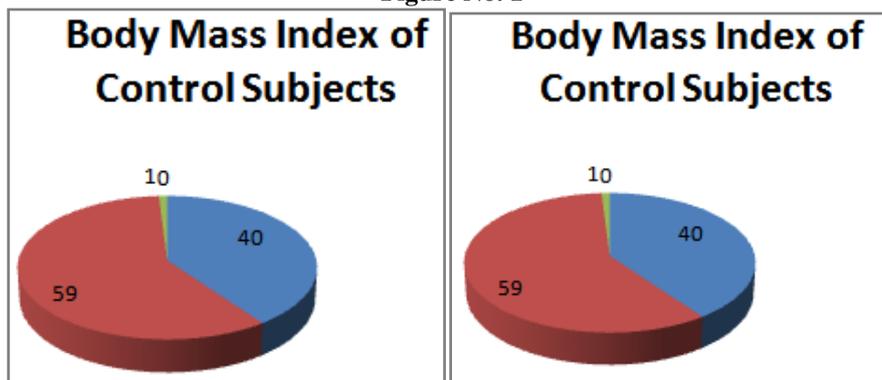
Figure No. 1

Figure shows that in the present study, it was observed that 48% of the Police officers working in police stations have attained over weight than non-police personal. 9.2% were obese as per BMI. This change directly affects the cardiovascular function in traffic police men.

It was also observed that BMI of the traffic police are gradually increasing proportionately with the age of the subject, that is duration of the exposure.

Figure No 2: Health status abnormalities among study subject and control subject.
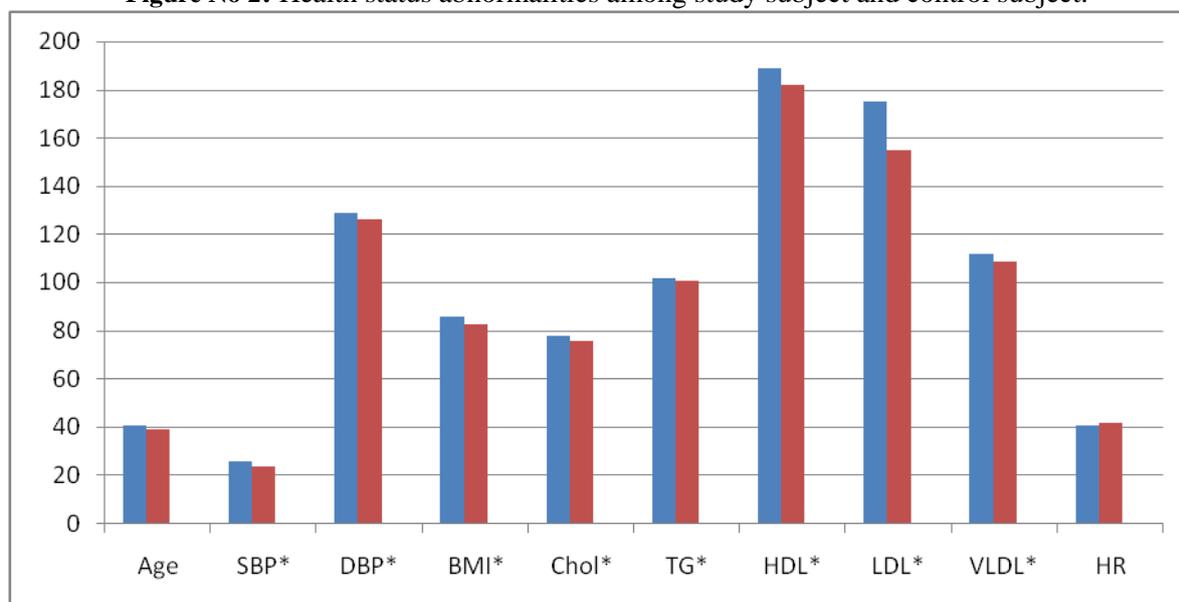
In the present study it was observed that there were marked differences in between Traffic Police men and control group in lipid profile which directly indicate the cardiovascular status. The police group had a higher mean of lipid parmeters and anthropometric measurements.although difference in age,heart rate LDL & VLDL were not stastically significant between traffic police and control group, Mean body mass [BMI] was higher and significant shown in table .

a. The mean difference of two variables SBP systolic blood pressure & DBP diastolic blood pressure of traffic police & control group were statistically significant .
b. The mean difference of HR heart rate of two group were statistically insignificant .
c. Difference of mean variables- Total cholesterol , Triglyceride High density lipoprotein were statistically significant.
d. Mean difference of LDL AND HDL were stastically insignificant.
   Abnormal lipid profile & blood glucose criteria are--

TG. $\geq$ 150mg/dl

HDL $<$ 50mg/dl

Tch $\geq$ 200mg/dl

Lipid profile as a cardiovascular risk factor of Study Subject and Control Subject

Variables	Police(n=100)	NP (n=100)	P Value
Total Cholesterol (TC-mg/dl)	189.59 ± 19.07 (140-212)	182.41 ± 11.25 (155-246)	<0.05
Triglyceride (TG-mm/dl)	175.35 ± 52.75 (95-220)	155.68 ± 20.88 (106-200)	<0.01
Low Density Lipoprotein (LDL-mm/dl)	112.35 ± 21.55 (83.8-140)	109.58 ± 5.95 (85-136)	NS
High Density Lipoprotein (HDL-mm/dl)	41.58 ± 5.95 (31-51)	42.90 ± 4.68 (35-47)	<0.05

Values are Mean ±S.D: P<0.05, <0.01 denotes statistical significance: NS means statistically not significance. Figures in parentheses indicate the range.

Physiological profile of control and study subject

Age (years)	31.50 ±7.10	31.10 ± 6.50	NS
Body Mass Index (kg/m^2)	25.91 ± 2.90 (18.65-31.23)	23.81 ± 4.32 (18.0-37.0)	<0.05
Systolic Blood Pressure (DBP-mm/Hg)	86.72 ± 8.63 (77-117)	82.82 ± 7.42 (70-11)	<0.05
Pre Working Heart Rate (HR-in minute)	78.83 ± 8.30 (60-100)	76.58 ± 6.20 (70-90)	NS
Mean Working Heart Rate	101 ± 9.25 (86-118)	100 ± 8.98 (87-119)	NS

In the present study it was observed that 46-50% of traffic police have over weight than non police personnel (fig 1&2)
9.2% were obese as per BMI

It was also observed that BMI of the traffic police working on the police stations are gradually increasing proportionally with the age of the subject i.e duration of the exposure .

V. Discussion

Present study showed that among the cardio- vascular risk factor the prevalance of general and abdominal obesity ,hypertension, hyper triglyceridemia were found to be more in traffic police than in general population.

High BMI (P value< 0.001) contributed significantly towards the development of cardiac disorder.BMI was in the overweight obesity range for 65.6 of officer we studies which is higher than the prevalence reported for general population in (7.20%).High blood levels of bad lipids were another factor & could be related to control obesity.

Prevalence of hypertriglyceridemia and mean levels of Triglyceride were more in traffic police than in general population which in turn increases the risk factor for hypertension.

Traffic police suffer higher morbidity & mortality rate from all cause then the general population. Cardio vascular disorders account for a significant portion of every illness with repeated prevalence as high as twice that of general population (52).

It was found out that nearly half of excess risk for heart disease and one-quarters of excess risk for stroke due to high BMI (body mass index) were caused through three metabolic risk factors: blood pressure, cholesterol, blood sugar level.

Our study revealed that occupation status of traffic police compared with that of non traffic police personnel predicted higher levels of systolic blood pressure, BMI, cardio v symptoms also reported similar finding [12.14 of no 4]

Traffic police constitutes an occupational group. That is more to increased prevalence of incidence of Cardio vascular and Respiratory with [11 of 4 no]

VI. Conclusion

Traffic police constitue an occupational group that is prone to increased prevalence of incidence of cardiocascular [11 of no.4]

The nature of work and lack of awareness contribute to this situation.It is unfortunate that a group selected for remarkable physical fitness at the entry stage fail to maintain it and succumb to life style disease that are very much prevalence.The fact that only 8% of those with hypertension were aw are of itThus this is reallyconcerned and reflect the inadequacy of healthcare activities among traffic police.

From the present study it was concluded that traffic police managing the urban area of NCR,MRT year suffered from cardiovascular problems.
1. The study conclude that long term exposure to chemical, gases and fumes present in environment make traffic police highly vulnerable for cardio vascular disease at work place.
2. The cardio vascular risk factor are found to be higher in traffic police.
3. It was seen that there was a co relation between blood pressure and Triglyceride in traffic police.
4. It was found that after the completion of the training period ,the traffic police had no training schedule or daily physical activity Due to enormous stress, high blood pressure and lack of regular basic exercise, BMI of traffic police insiginitically (<0.01) higher then the control group.This increases the risk for cardiovascular disease.

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