

## Cardiovascular Health of Solapur Policemen

Dr. Shafique Ahmed Mundewadi<sup>1</sup>, Dr. Daokar Rameshwar<sup>2\*</sup>, Dr. Deepak Bansode<sup>3</sup><sup>1</sup>Associate Professor, <sup>2</sup>Associate Professor, <sup>3</sup>Professor Dept. of Physiology, Dr. V. M. Govt Medical College, Solapur Maharashtra India

\*Corresponding author: Dr. Daokar Rameshwar | Received: 14.05.2019 | Accepted: 21.05.2019 | Published: 30.05.2019

DOI: [10.21276/sjams.2019.7.5.32](https://doi.org/10.21276/sjams.2019.7.5.32)

### Abstract

### Original Research Article

**Background:** Present study was carried out on 100 policemen of Solapur city who came for health checkup organized on behalf of police commissioner's office. **Aim:** To find prevalence of Hypertension by measuring B.P. To find prevalence of risk factors by finding percentage body fat & Body Mass Index (B.M.I). **Material:** 100 policemen were selected randomly from 300 policemen who came for health checkup. **Setting and Design:** Out of 100 policemen 16 were between 20-30 years age, 31 were between 30-40 years age, 34 between 40 to 50 years age and 19 were between 50 to 60 years age. **Method:** Pulse measured manually for 1 min, Basal B.P. measured using mercury sphygmomanometer, Percentage Body fat using electronic instrument based on principle of electrical impedance % body fat was measured. B. M. I. Measured by formula weight in kg divided by height in meter square. **Results:** Were tabulated based on age groups. It was found that as per Indian Hypertension Guidelines II 30.9% were having High normal B.P and 40.1% were falling in category of stage I Hypertension. Associated risk factors such as percentage of body fat which was excess in 77% and obesity i.e.(BMI>25kg/m<sup>2</sup>.) was 71% indicating vulnerability of this population to cardiovascular disorders. **Conclusion:** The background of increase body fat & stressful life adds burden on cardiovascular system leading to increase prevalence of Hypertension in policemen compared to general population.

**Keywords:** BMI % body fat BP Policemen.

**Copyright © 2019:** This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

## INTRODUCTION

In present day life the incidence of cardio-vascular disorder is gradually increasing due to increased stress and strain in day to day life. One of common way of presentation of cardiovascular diseases is in the form of hypertension. Raised B.P. is a common condition that doesn't have specific clinical manifestation until target organ damage develops [1]. The importance of hypertension lies in the fact that it forms one of the risk factors for, coronary heart diseases, stroke, atherosclerosis, and peripheral vascular diseases [2-4]. With increase in incidences of overweight and obesity both in children's and adults, it is likely that the incidence of hypertension will increase. So finding the risk factors and taking appropriate measures in time could prevent major life threatening complication. Police force is constantly under stress and strain right from their entry in police force up to retirement age. Long duty hours, night shifts, less hours of sleep, no fix timing of food, political pressure, no weekly off in hours of bandobast, life threatening situations during riots, encounter with criminals and long list so on. Apart from that no

regular time for exercise. To maintain physical fitness only weekly parade is there that to each policeman gets twice or thrice monthly chance of parade.

Finally screening adults to detect hypertension early and initiate treatment before the onset of target organ damage is highly cost effective. So we planned the study to screen policemen with following aims and objectives.

### Aims

To find the prevalence of risk factors for the cardio-respiratory disorders in policemen of Solapur city

### Objectives

- 1) To find prevalence of Hypertension by measuring B.P.
- 2) To find prevalence of obesity by finding
  - a) B.M.I.
  - b) % Body fat

## MATERIALS AND METHODS

Present work was planned on policemen's attending health checkup camp organized by Civil Surgeon, on request of Police Commissioner. Total 100 policemen visited our department. They were grouped based on age.

Group-I	Age – 20 to 30 yrs.—16
Group-II	31 to 40 yrs.—31
Group-III	41 to 50 yrs.—34
Group-IV	51 to 60 yrs.—19

Then each policeman underwent following test

- Pulse measured manually for 1 min
- Basal B.P. Measured using mercury sphygmomanometer [4-7].
- Percentage Body fat:

Using electronic instrument based on principle of electrical impedance % body fat was measured.

d) Body Mass Index [8]

$$\text{B.M.I.} = \frac{\text{wt.in kg.}}{\text{Ht.in m}^2}$$

Permission of institutional Ethical committee was sought through proper channel. Each subject was explained the procedure properly then with verbal consent examination was carried out.

## OBSERVATIONS

**Table-I: Blood Pressure**

GROUP	SAMPLE SIZE	NORMAL	ABNORMAL	% of Abnormal
TOTAL	100	83	17	17
GROUPI	16	16	0	0
GROUPII	31	27	4	12.91
GROUPIII	34	27	7	20.58
GROUPIV	19	14	5	26.31

Footnote: S.B.P.normal 139mm of Hg, >140mm of Hg abnormal and D.B.P.normal 89mm of Hg,>90mm of Hg abnormal [2,9]

**Table-II: Percentage Body FAT**

GROUP	SAMPLE SIZE	NORMAL	ABNORMAL	% of Abnormal
TOTAL	100	23	77	77
GROUPI	16	14	2	12.5
GROUPII	31	5	26	83.87
GROUPIII	34	4	30	88.23
GROUPIV	19	0	19	100

Footnote: % body fat normal 12-18 %, > 18% abnormal [8]

**Table-III: OBESITY**

GROUP	SAMPLE SIZE	NORMAL	ABNORMAL	% of Abnormal
TOTAL	100	41	59	59
GROUPI	16	14	2	12.5
GROUPII	31	9	22	70.96
GROUPIII	34	12	22	64.7
GROUPIV	19	6	13	68.42

Footnote: Obesity assessed using B.M.I unit kg/m<sup>2</sup>, B.M.I. normal 20-25kg/m<sup>2</sup>, >25kg/m<sup>2</sup> overweight [9]

## RESULTS

Results of our study reveals that out of 100, 66% policemen were obese based on BMI >25 kg/m<sup>2</sup>. The BMI is perfectly normal in group-I 20 – 30 yrs.age. But from 31 to 60 yrs. It increased rapidly being 68.42% in 50-60 age group. Correspondingly the % body fat is 100% excess in 50-60 age group. Indicating almost 60-70% subjects have potential risk of developing cardiovascular disorder.

Now out of 100 about 17 persons have high B.P.As per W.H.O International Society of Hypertension systolic B.P. >140mm of Hg or diastolic B.P. > 90mm of Hg are labeled as hypertensive [2,9]. High B.P. is mainly in 30-60 yrs.age groups in ascending order, being 13% in Gr II i.e.30-40 age group, indicating occurrence of high B.P. at younger age which is an ominous sign. Also in group III 20.58% and in group IV

26.31%. So almost 20% have high B.P. So this indicates vulnerability of this population to cardiovascular risk factors. So in all 66% were obese with 77% having excess body fat & 20% had high B.P.

## DISCUSSION

The results of our study reveal that prevalence of Hypertension in Solapur policemen was 19.84% (Group II, III&IV) and it was found to increase steadily with age. These findings are quite high in comparison with studies done on general population. S.S. Reddy et-al (in 2005) [10] have found prevalence of hypertension 8.6% in residents of urban slum area of Tirupati town in A.P. In that they have found prevalence 2.3% in Gr.II (30-40), 11.9% in Gr.III (40-50) and 38% in Gr.IV (50-60). Similarly in study by S.V.Joshi etal in 2000<sup>(11)</sup> in Mumbai have found the prevalence of HT 7.8% in total. Out of that 3.5% in Gr.II and 11% in Gr.III & 21.30% in Gr. IV. Similarly in a study in Nagpur district prevalence rose from 4% in young to 17.2 in (60+) [11].

These all studies indicate that prevalence of HT is quit high in policemen of all age groups compared with general population in different parts of country. This high prevalence could be due to the associated risk factors found in current study. BMI (Quetlet index) [8, 9] normal range is 20-25kg/m<sup>2</sup>. WHO [9] have classified overweight in three grades based on BMI.

Overweight	>25.00 kg/m <sup>2</sup>	
Preobese	25 to 29.99 kg/m <sup>2</sup>	Increased
Grade – I	30.00to	34.99kg/m <sup>2</sup>
Moderate		
Grade – II	35 to 39.99 kg/m <sup>2</sup>	Severe
Grade – III	above 40 kg/m <sup>2</sup>	Very severe

Total prevalence of obesity was found to be 59%. The incidence again gradually increased with age. Out of that 64.40% were in Grade-I overweight & 33.89% were Grade-II overweight & 1.69% in Grade –III overweight.

The percentage body fat in men is between 12-18% [8] normally, it was in excess i.e. (>18%) in 77% of policemen this again gradually increased with age reaching almost 100% in Gr.IV. In oct.-05 Christou DD et al in their study found that body fatness is a better predictor of cardiovascular disease risk factor and elevated body fatness is associated with an adverse cardiovascular risk factor [12,13].

When compared with younger age group (20-30) in policemen they the values are quit normal. BMI more in 12.5% only & B.P. normal in all individual. Usually this age group is entry level age group. These

values are comparable with general population. But as the age advances in policemen risk factors rises very sharply as compared with general population. Probably reasons for this much rise in risk factors could be lack of exercise.

At the entry level strict scrutiny is done to find physical fitness in candidate joining police force. But after joining no special measure is used to maintain the level of fitness. Twice weekly parades is arranged that to for fix number of policemen only so each policeman gets twice or thrice monthly chances to attend parade. So the very purpose of entry level physical fitness test is lost.

There is still much uncertainty about the pathophysiology of hypertension. A small number of patient (2-5%) have an underlying renal or adrenal disease as cause for hypertension. In the remainder no single identifiable cause is found. Among the factors that have been intensively studied are salt intake, obesity, insulin resistance, the rennin-angiotensin system, and sympathetic nervous system. rennin is also reliesed in response to sympathetic stimulation [3].

### Stressful life

The main & foremost cause of cardiovascular diseases is stress [14]. After entry in police force policemen are exposed constantly to various types of stress & strains.

- Long duty hours
- Improper sleep
- No weekly off in time of bandobast period
- Riots
- Political pressure, pressure from senior officers.
- Encounters

Under stressful situations, body secretes stress hormones, adrenaline & nor adrenaline [8] which if not disposed off by exercise, produces harmful effect on cardio vascular system leading to subsequent complications. Also corticosteroids are released which alters bodies fat metabolism [8]. Apart from job stress most of policemen due to improper timing of food develop bad food habits such as consuming oily and spicy food from hotels, dhabas. Most of policemen start drinking, smoking and tobacoo chewing. All these again add more burden on cardiovascular system.

So finally we conclude that lack of exercise & poor dietary habits have lead to increase in % body fat leading to obesity [15, 16]. The background of increase body fat & stressful life adds burden on cardiovascular system leading to increase prevalence of Hypertension in policemen compared to general population.

So looking at the above finding we suggest certain measure for police force.

- Regular aerobic exercise in morning or evening at least thrice weekly for each police right from entry in police force till retirement.
- Duties should be arranged in three shifts in 24 hours with 8 hours each, so that proper time for sleep is provided.
- Regular health check & screening for cardiovascular diseases
- Regular weight checkup and BMI should be maintained within standard limit of 18 to 25 kgm<sup>2</sup>

predictors of cardiovascular disease mortality among men with diabetes. *Archives of internal medicine*. 2005 Oct 10;165(18):2114-20.

14. Kožená L, Frantík E, Horváth M. Cardiovascular reaction to job stress in middle-aged train drivers. *International journal of behavioral medicine*. 1998 Dec 1;5(4):281.
15. Association of BMI & obesity with physical activity, food choices, alcohol intake & smoking in the 1982-1907 FINRISK studies *Am J clin Nutr*. 2002, (75): 809-17
16. Guo S S, Zeller C. Aging, body composition & life style the fels longitudinal study *Am J clin Nutr*.1999;70:405-11

## REFERENCE

1. McAlister FA, Straus SE. Measurement of blood pressure: an evidence based review. *Bmj*. 2001 Apr 14;322(7291):908-11.
2. Kumar and Clarks Clinical Medicine. 5<sup>th</sup> Edition p-819
3. Beevers G, Lip GY, O'brien E. Blood pressure measurement: Part I—Sphygmomanometry: factors common to all techniques. *Bmj*. 2001 Apr 21;322(7292):981-5.
4. Das UN. Biological significance of essential fatty acids. *Journal-Association Of Physicians of India*. 2006 Apr;54(R):309.
5. Beevers G, Lip GY, O'brien E. Blood pressure measurement: Part II—Conventional sphygmomanometry: Technique of auscultatory blood pressure measurement. *Bmj*. 2001 Apr 28;322(7293):1043-7.
6. Reeves RA. Does this patient have hypertension?: How to Measure Blood Pressure. *Jama*. 1995 Apr 19;273(15):1211-8.
7. Bhalla A, Singh R, D'cruz S, Lehl SS, Sachdev A. Accurate blood pressure recording: is it difficult?. *Indian journal of medical sciences*. 2005 Nov 1;59(11).
8. William F Ganong. "Review of medical Physiology". 21<sup>st</sup> edition & 18<sup>st</sup> edition. 276-313.
9. Text book of Preventive and Social Medicine K. Park 18<sup>th</sup> Edition p-317
10. Reddy SS, Prabhu GR. Prevalence and risk factors of hypertension in adults in an Urban Slum, Tirupati, AP. *Indian Journal of community medicine*. 2005 Jul 1;30(3):84.
11. Joshi SV, Patel JC, Dhar HL. Prevalence of hypertension in Mumbai. *Indian journal of medical sciences*. 2000 Sep;54(9):380-3.
12. Christou DD, Gentile CL, DeSouza CA, Seals DR, Gates PE. Fatness is a better predictor of cardiovascular disease risk factor profile than aerobic fitness in healthy men. *Circulation*. 2005 Apr 19;111(15):1904-14.
13. Church TS, LaMonte MJ, Barlow CE, Blair SN. Cardiorespiratory fitness and body mass index as