International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Original Research Article

Cross Sectional Study of Obesity in Police Personnel in Akola City, Maharashtra, India

Aggarwal Sumit S[1], Ambalkar Deepti D[2], Kale Kalpana M[3], Aswar Nandkeshav R[3], Bhatkule Prakash R[4]

[1]Assistant Professor, [2]Medical officer, [3]Associate Professor, [4]Professor,
Dept. of Community Medicine, Govt. Medical College, Akola, India.

Corresponding Author: Aggarwal Sumit S

Received: 13/01/2015 *Revised: 24/02/2015* *Accepted: 26/02/2015*

ABSTRACT

Introduction: The police are the law enforcement personnel. They deal on a regular basis with an assortment of unique situations and stressors. Working throughout the day in such an atmosphere produces adverse physical and psychological effects. This study was conducted to assess the health problems of the police personnel.
Aims: To assess the obesity status of the police personnel under Akola police commissionerate and to know various self reported morbidities in police personnel.
Study design: Cross sectional study.
Methodology: Health check up was done for 1327 police personnel during October and November 2014. Socio-demographic information was collected from them as per the semi-structured questionnaire. Anthropometric measurements e.g. height and weight was recorded from each person. Self reported morbidities were also recorded .Data was analyzed by using Epi-info 7 software.
Result: In the present study, out of 1327 police personnel 1263 (95.18%) were male and 64 (4.82%) were female. Out of 1327 police, 48 were officers while 1279 were below officer's rank. The percentage of overweight was more in non officers (28.62%) as compared to that in officers (14.58%) which is statistically significant. Most common morbidities found in these police personnel were- Myalgia (including back pain, joint pain) (31.20%), Gastrointestinal morbidities (25.77%), Hypertension (15.82%), Diabetes mellitus (11.98%), Neuropsychiatric morbidities (07.99%)
Conclusion: A Physical fitness program to be made mandatory for the police personnel to keep them physically and mentally fit, to improve their quality of life. Routine health checkups should be done to detect lurking dangers.

Key words: BMI, Police personnel, Overweight

INTRODUCTION

Health is not something that one possesses as a commodity, but connotes rather a way of functioning within one's environment (work, recreation, and living). The work environment constitutes an important part of man's total environment, so health to a large extent is affected by work conditions. [1] The police are the law enforcement personnel. They deal on a regular basis with an assortment of unique situations and stressors. The shock of each

tragedy and violent event takes a cumulative physical and mental toll on each police officer in some way or the other. Increased demands of work impinging upon home life, lack of consultation and communication with the higher authorities in the organization, lack of control over workload and inadequate support have been identified as the potential factors responsible for the stress in the policemen. [2,3] The police are trained in policing, but not about how to maintain their mental and physical well being. Working throughout the day in such an atmosphere produces adverse psychological effects. Moreover long working hours, irregular eating habits, sleepless nights, shift duties and disturbed personal life produces stress in the police officer's life and they become vulnerable to various disorders. [4]

Obesity is a medical condition in which excess body fat has accumulated to an extreme that it may have an adverse effect on health, leading to reduced life expectancy. It may lead to increased rate of hypertension, diabetes mellitus, coronary artery disease and various other morbidities. Obese police officers might also face problem in their job which is riding/driving long distances, standing/sitting for a long time.

This study was conducted to assess the health problems especially obesity of the police personnel, so that physical fitness program can be made mandatory to them to improve strength, endurance, reduce stress etc.

MATERIALS AND METHODS

Method: This cross sectional study was conducted on police persons of Akola district of Maharashtra (India). Police inspector and below police inspector rank with age 30 years and above were considered for the study. In Akola district there were total 2375 policemen aged 30 years and above. Of this 1327 (55.87%) were included in this study. Remaining 1048(44.13%) did not respond to our call in the study. Study was conducted during 1st October to 30th November 2014. Before start of study Permission from higher authority was taken. All policemen were informed about the purpose of study. Rapport was developed with them and verbal consent was taken. Socio-demographic information was collected from them. As per the semi-structured questionnaire all personnel were clinically examined for various morbidities. Anthropometric measurements e.g. height and weight was recorded from each person.

Weight was measured by asking the subject to look straight and stand straight on the pre standardized weighing machine. Belt, shoes, mobile phone, and other heavy objects were asked to remove. The zero was checked every time. The subject was asked to stand on the weighing machine and weight was recorded to the nearest kilogram rounding up if midway. [5,6]

Height was measured by asking the subject to stand straight against the wall mount height scale, with both foots together and the heels, calf, buttocks, shoulder and occipital touching the wall. Eyes should be directed forward so that the top of the tragus of ear remains horizontal with interior orbital margin. The measuring plate is lowered on the scalp and height is recorded to the nearest centimeter, rounding up if midway using the measuring scale. [5,6]

For Obesity assessment BMI was calculated as weight in kilograms divided by the square of the height in meters (kg/m2) [6] and classified as per WHO classification of obesity. Data was analyzed by using Epi-info 7 software and appropriate test of significant was applied wherever required.

RESULTS

In the present study, out of 1327 police personnel 1263 (95.18%) were male

and 64 (4.82%) were female. Male to female ratio was about 20:1 (Table 1). 319(24.04%) subjects belonged to age group 31 to 40 years, 769 (57.95%) to 41 to 50 years age group and 239 (18.01%) to 51 to 60 years of age group. Mean age of the police personnel was about 44 year 4 months (Male 47 years 3 months, female 42 years 2 months).

Table 1: Age group and gender wise distribution of study subjects.

Sr. No	Age Group	Male (%)	Female (%)	Total (%)
1	31-40	295 (92.47)	24 (7.53)	319 (100)
2	41-50	735 (95.58)	34 (4.52)	769 (100)
3	51-60	233 (97.49)	06 (2.51)	239 (100)
Total		1263 (95.18)	64 (4.82)	1327 (100)

Table 2: Distribution of police personnel as per their rank

Sr. No.	Name of designation	Male (%)	Female (%)	Total(%)
1. Officer rank	Police inspector	007	000	007
	Assistant police inspector	009	001	010
	Police sub inspector	031	000	031
	Total	**047 (97.92)**	**001 (2.08)**	**048 (100)**
2.Below officer rank	Assistant sub inspector	183	004	187
	Head constable	376	013	389
	Police Naik	336	009	345
	Constable	321	037	358
	Total	**1216(95.07)**	**063(4.93)**	**1279(100)**
	Grand Total	1263 (95.17)	064 (4.83)	1327 (100)

It is observed that out of 1327 police, 48 were officers of which only one was female while 1279 were below officers rank (non officer ranked) of which 1216 (95.07%) were male and 063(4.93%) were female (table 2).

Table 3 shows distribution of police personnel as per the WHOs BMI classification. It is observed that maximum 938 (70.69%) were in normal range of BMI. 347 (26.15%) police persons were overweight, 26 (1.95%) belonged to obese class I and no one were observed in obese class II & Class III.

Table 3: Sex of the police personnel and BMI

Classification	Male (%)	Female (%)	Total (%)
Underweight (<18.50)	014 (1.17)	002 (3.13)	016 (1.21)
Normal range {18.50 - 24.99}	895 (70.86)	043 (67.19)	938 (70.69)
Overweight(≥25.00-29.99)	331 (26.21)	016 (25)	347 (26.15)
Obese class I (30.00 - 34.99)	023 (1.82)	003 (4.68)	026 (1.95)
Obese class II (35.00 - 39.99)	000 (00)	000	000 (00)
Obese class III (≥40.00)	000 (00)	000	000 (00)
Total	1263 (100)	064 (100)	1327(100)

Table 4: Distribution of police personnel according to their rank and BMI

Rank	BMI		Total (%)
	≤ 24.99 **BMI**	>24.99 ***BMI***	
Officer ranked	041 (85.41 %)	007 (14.58%)	0048 (100%)
Below officer ranked	913 (71.38%)	366 (28.62%)	1279 (100%)
TOTAL	954 (71.89%)	373 (28.11%)	1327 (100%)

(x^2 = 4.508 , d.f.= 1, p= 0.03 significant)

Out of 48 officers 41 were found non-obese and remaining seven were observed overweight. Out of 1279 non-officers, 913 were non-obese and 366 were found overweight (BMI ≥25) (table 4).

The percentage of overweight was more in non officers as compared to that in officers, This difference is found to be statistically significant (x^2 = 4.508 , d.f.= 1, p= 0.03 significant).

Table 5: Sex wise distribution of BMI in study subjects

Sex	BMI		
	≤ 24.99	>24.99	Total (%)
Male	909 (71.97)	354 (28.03)	1263 (100)
Female	045 (70.31)	019 (29.69)	0064 (100)
Total	954 (71.89)	373 (28.11)	1327 (100)

(x^2 = 0.083, d.f.= 1, p= 0.77 not significant)

Out of 1263 males 909 (71.97%) were found to have BMI < 25 and remaining 354 (28.03%) were observed to have BMI ≥ 25. Among 64 females out of 45 (70.31%) were having BMI < 25 and 19 (29.69%) were found to have BMI ≥ 25 (table 5). This difference is found to be statistically not significant (x^2 = 0.083, d.f.= 1, p=0.77 not significant).

Table 6: Self reported morbidities in police personnel (in last 6 months)

Sr No.	Morbidities	(Percentage)
1	Myalgia (including back pain, joint pain)	414 (31.20)
2	Gastrointestinal morbidities: (Gastritis, Gastro-esophageal reflux disease, Gastric ulcers, Bowel upset)	342 (25.77)
3	Hypertension	210 (15.82)
4	Diabetes mellitus	159 (11.98)
5	Neuropsychiatric morbidities: (Insomnia, Depression)	106 (07.99)
6	Others (liver disease, varicose vein, piles, skin disease, URTI)	183 (13.96)

Some subjects have more than one morbidities

Table 6 show various morbidity reported by police personnel in last six months. Most common morbidities found were- Myalgia (including back pain, joint pain) 414 (31.20%), Gastrointestinal morbidities 342 (25.77%) which included Gastritis, Gastro-esophageal reflux disease, Gastric ulcers, Bowel upset, Hypertension 210 (15.82%), Diabetes mellitus 159 (11.98%), Neuropsychiatric morbidities 106 (07.99%) and followed by various others morbidities 183 (13.96%) which included liver disease, varicose vein, piles, skin disease, asthma, URTI .

DISCUSSION

An obese person has accumulated so much body fat that it might have a negative effect on their health like obesity, hypertension, diabetes, coronary heart disease etc. BMI is a fairly reliable indicator of body fatness for most people. BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat, such as underwater weighing and dual energy x-ray absorptiometry (DXA). [7,8] BMI can be considered an alternative for direct measures of body fat. Additionally, BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems. If Body Mass Index (BMI) is more than 25 kg per meter square then they are considered as overweight and if more than 29.9, then considered as obese. Police personnel have different life style from other occupations. They have to work in the field many times so they used to eat street food, which is more oily, low quality oil and have repeated frying etc. they have irregular sleep, psychological exhaustion (as people tend to eat more when stressed, depressed or tensed) and consumption of high calorie food like bada pav, samosa, tea, bhajiye, cold drinks etc due to accessibility and low cost. While police personnel officers have more duty on their head quarter and have officer work but non officers have various field duties like bandobast duty, traffic control, VIP duties, toll checking etc. Also officers do more physical exercise and more aware of their diet & food. The present study has shown that 85.41% of officer ranked police personnel are having BMI ≤ 24.99 compare to 71.38% of non officer police personnel. This difference was significant. Out of 1327 subjects, 954 (71.89%) had BMI >24.99 while 373 (28.11%) subjects had BMI ≤ 24.99. In the study carried out by Saha A. et al (2010) [9] conducted a questionnaire study on 105 police officers working in different police stations from Hoogly district, West Bengal. Their study results revealed that,

BMI was > 25 in 56% police officers. In another cross sectional study conducted by G. Jahnavi et al, [10] in Siddaartha Institute of Medical Sciences at the city police Parade Ground Dispensary in Vijayawada, found that 58% police persons were having BMI ≥25.

It was also observed in study that 537 (40.47%) of study subjects are having Gastrointestinal morbidities followed by Myalgia (including back pain, joint pain) 414 (31.20%), Hypertension 210 (15.82%), and Diabetes mellitus 159 (11.98%). In the study carried out by Brown JJ et al (1998) [11] to assess the prevalence of low back pain among 1002 members of Royal Canadian Police Force, overall one-year prevalence of low back pain was found to be 41.8%. Kumar S. et al (2008) [12] conducted an epidemiological study on a group of policemen in Kolkata (n=2160) to estimate the prevalence of diabetes and found that the prevalence of diabetes was 11.5%. Rajaratnam SM et al (2011) [13] conducted a cross-sectional and prospective cohort study on North American police officers (n=4597). Their study results showed that 1666 (33.6%) screened positive for obstructive sleep apnea, 281 (6.5%) for moderate to severe insomnia. G. Jahnavi et al. (2012) [10] found that 203(33%) of the police personnel were hypertensive and 229 (37%) were diabetic. In the study carried out by Shabana T. et al (2008) [14] found that 58.5% policemen had hypertension. A study conducted by Satapathy et al (2009) [15] found that musculoskeletal disorders (27.13%), hypertension (25%), and diabetes (6.25%) were common health problem in study subjects.

CONCLUSION

A police department has an obligation to recruit and maintain officers that are properly trained and physically capable of responding to the needs of all citizens. Due to enormous stress, high pressure work, faulty food habits, irregular sleep, ignorance and irregular basic exercise, they have higher risk of cardiovascular diseases. Implementation of a physical fitness programme, a regular balanced diet, inoculation training for managing stress can improve the life of the officers and make them less prone to life style diseases. Health checkups should be made mandatory; so that self-indulgent habits and negligent behavior do not harm these law keepers. They look after the well being of the public so their well being also should be taken care.

REFERENCES

1. World Health Organization. WHO Technical Report Series 571.Geneva: World Health Organization; 1975. Early detection of health impairment in occupational exposure to health hazards, Report of a WHO study group.
2. Collins PA, Gibbs AC. Stress in police officers: a study of the origins, prevalence and severity of stress - related symptoms within a county police force police force. Occup Med (Lond) 2003; 53:256-64.
3. Gisli H, Gudjohnson K, RC Adlam RC. Occupational stressors among British police officers. Police Journal 1985; 58:73-79.
4. Rakesh P. The hidden assailant. Deccan Herald (Kolkata) 2003, July 13.
5. Jelliffe DB, the assessment of the nutritional status of the community. Geneva, Switzerland: World Health Organization; WHO Monograph series-53, 1966.
6. WHO, Geneva, Switzerland: World Health Organization; TRS – 916.
7. Mei Z, Grummer-Strawn LM, Pietrobelli A, Goulding A, Goran MI, Dietz WH. Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and

adolescents. *American Journal of Clinical Nutrition*2002;7597–985.
8. Garrow JS and Webster J. Quetelet's index (W/H2) as a measure of fatness. *International Journal of Obesity*1985;9:147–153.
9. Saha A., Sahu S, Paul G. Evaluation of cardio-vascular risk factor in police officers. International Journal of Pharma and Bio Sciences, Vol.1/Issue-4/Oct-Dec.2010/ 263-71.
10. G.Jahnavi, Patra S R, Chandrasekhar C H, B. Nageswara Rao, Unmasking the health problems faced by the police personnel. Global Journal of Medicine and Public Health Vol. 1(5) September-October 2012 P 64-9.
11. Brown JJ, Wells GA, Trottier AJ, Bonneau J, Ferris B. Back pain in a large Canadian police force. Spine (Phila Pa 1976). 1998 Apr 1;23(7):821-7.
12. Kumar S, Mukherjee S, Mukhopadhyay P, Pandit K, Raychaudhuri M, Sengupta N, Ghosh S, Sarkar S, Mukherjee S, Chowdhury S. Prevalence of diabetes and impaired fasting glucose in a selected population with special reference to influence of family history and anthropometric measurements--the Kolkata policeman study**.** J Assoc Physicians India. 2008 Nov;56:841-4.
13. Rajaratnam SW, Barger LK, Lockley SW, et al. Sleep Disorders, Health, and Safety in Police Officers. *JAMA.* 2011; 306(23):2567-2578.
14. Tharkar S, Kumpatla S, Muthukumaran P, Viswanathan V, High prevalence of metabolic syndrome and cardiovascular risk among police personnel compared to general population in India. JAPI, 2008;56:845-849.
15. DM Satapathy, TR Behera, RM Tripathy. Health status of traffic police personnel in Brahmapur city. Indian J Community Med 2009;34(1) :71-2.

How to cite this article: Aggarwal SS, Ambalkar DD, Kale KM et. al. Cross sectional study of obesity in police personnel in Akola city, Maharashtra, India. Int J Health Sci Res. 2015; 5(3):6-11.

****