

Risk Factors for Hypertension in Serving Uniform Personnel of Pakistan Navy

Javed Iqbal, Muhammad Akhtar Parvez, Muhammed Abdal

ABSTRACT

Objective: To highlight the risk factors relevant to hypertension in Naval set up and to submit recommendations for a better control of these risk factors. **Study Design:** A retrospective study. **Place & Period of study:** The study was conducted over a three years period at PNS SHIFA and PNS RAHAT hospitals, Karachi, Pakistan, from Feb 2012 to Feb 2015. **Subjects and Methods:** Medical record of 118 diagnosed cases of Essential hypertension was retrieved from Pakistan Navy Medical Record Section (PNMRS) and was scrutinized. Interviews were arranged when and where found necessary/possible. Based upon detailed history, physical examination and investigations the risk factors responsible for their hypertension

were identified and recorded. **Results:** Out of 118 patients studied, 45% were found to be sailors followed by officers (32%) and chief petty officers (23%). Age group most affected was 31-40 years (36%). Smoking, sedentary lifestyle, stress of service conditions and high caloric diet were found to be the most common factors contributing to high blood pressure. **Conclusion:** General awareness of healthy life style, avoidance of smoking, alleviation of unnecessary stresses, and dietary modifications along with ample opportunities for recreation could control the emergence of hypertension in serving personnel of Pakistan Navy. **Key words:** Risk factors, hypertension, Pakistan Navy, serving uniform personnel, service stresses.

Article Citation: Iqbal J, Parvez MA, Abdal M. Risk Factors for Hypertension in Serving Uniform Personnel of Pakistan Navy. APMC 2015;9(2):83-88.

INTRODUCTION

Hypertension is one of the leading diseases affecting the overall population of Pakistan in general and serving naval personnel of Pakistan Navy (PN) in particular. It is the one of the main causes of morbidity and mortality¹ among the general population and also increases the risk of coronary vascular disease².

Early recognition of factors that induce hypertension is not only of theoretical but also of practical importance, as stated by Beilin "it is no longer appropriate to define essential hypertension as a rise in blood pressure without cause, since a

number of causes can be clearly identified in most cases of so-called essential hypertension"³. There are many risk factors documented to be responsible for hypertension, usually acting in combination. These include age⁴, gender⁵ (males > females), ethnic origin⁶ (black > white), diet⁷, smoking⁸, sedentary life style⁹, overweight/higher body mass index⁹, stress⁹, family history of hypertension¹⁰, high levels of blood cholesterol¹¹ and diabetes mellitus¹². Emergence of hypertension in Naval personnel is surprisingly very high despite the fact that they are selected after thorough medical screening and enjoy a perfect standard of health at the time of induction. It was noticed that difficult service conditions, in addition to smoking, high caloric diet and sedentary life style, were probably responsible for development of hypertension in our sailors at a comparatively lower age group. The study was conducted to identify the risk factors of

Corresponding Author:

Surg Cdre Dr. Javed Iqbal
Medical Specialist
PNS Shifa Hospital Karachi
Tel. +92 334-5414590
E-mail: dr_javed_iqbal@hotmail.com

hypertension in Naval setup, thereby aiming at their prevention for a better outcome.

MATERIALS & METHODS

The objectives of this study were to highlight the risk factors relevant to hypertension in Naval set up and to submit recommendations for a better control of these risk factors. It was a retrospective study carried out at PNS SHIFA and PNS RAHAT hospitals Karachi over a three years period from May, 2001 to May, 2004. A total of 118 serving naval personnel were diagnosed and down categorized at these hospitals with the final diagnosis of hypertension, during the specified period. All of these patients were included in our study. Their complete medical record containing detailed medical history, general physical/systemic examination and detailed investigations was collected from Pakistan Naval Medical Record Center (PNMRC) and scrutinized. A total of 103 patients were contacted and interviewed when and where possible with special emphasis on the risk factors pertinent to hypertension Such as life style, smoking habits, dietary habits, job stress, family history of hypertension, and diabetes mellitus. 15 patients could not be contacted because of one reason or the other, however their medical record revealed all the necessary and relevant information required for the study.

All patients had been thoroughly investigated with relevant laboratory tests, which included Urine R/E, Serum urea, creatinine and electrolytes, serum cholesterol, blood glucose, ECG, X- Ray chest, Ultra Sound KUB including special investigations like 24 hour urinary VMA etc, where required, for the diagnosis of secondary hypertension . 4 patients were found to have, renal artery stenosis (one) diagnosed on renal angiogram, polycystic Kidney disease (two) and atrophic kidney likely due to chronic glomeulonephritis (one) and were not included in the study. Only those patients in which no definite cause of hypertension was evident (Primary / Essential hypertension) were taken care of in the study and an effort was made to look into the possible risk factors responsible for their hypertension. All the information was recorded on a data collection Performa. Freshly diagnosed

cases of hypertension or where investigation/documentation was incomplete were also excluded from the study.

RESULTS

Scrutiny of documented 118 cases of essential hypertension revealed that the majority of the patients belonged to the lower ranks of Pakistan Navy (figure No. 1). Age limit ranged from 24 to 54 years and 31-40 years of age group was the most affected (table No 1). The relative frequency of identified risk factors for HTN is shown in table No 2. Stresses due to hardship of service was found to be the very common shared risk factor along with Smoking, sedentary life style and high caloric diet as other major risk factors amid this series, and are enlisted in table No 3. Body mass index (weight in kilograms divided by height in meters squared) of the patients is shown in table No 4. Weight of 10 patients was not available from their medical record, neither could they be contacted and therefore BMI of only 108 patients was calculated. Probable contribution of overweight to high BP was negligible in our results, as only 2.77% of patients were overweight having BMI above 25 and no patient was in the obesity range of BMI.

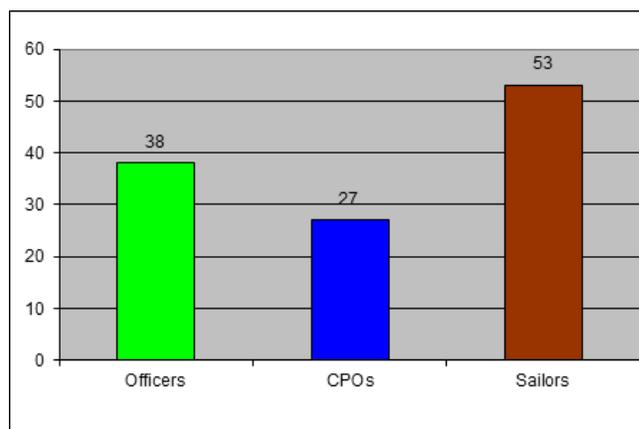


Figure 1: Cases of hypertension in different rank categories

In most of our patients, combinations of two or more risk factors were identified. Nearly all of these were found in association with one or the other form of service related stress, which because the commonest, was possibly, the most important of all the risk factors identified. It was further

noted that not a single patient had stress alone as a sole risk factor responsible for their hypertension.

Table 1: Relative frequency of hypertension in different age groups

Age Group	No.	Percentage
(24-30Yrs)	37	31%
(31-40Yrs)	42	36%
(41-54Yrs)	39	33%
Total No.	118	

Table 2: Relative frequency of risk factors in HTN cases

Risk Factors	No.	Percentage
Smoking	31	26.3%
Sedentary life style	24	20.3%
High Caloric Diet	21	17.8%
Cholesterol > 200 mg/dl	12	10.2%
Family history	14	11.9%
Diabetes Mellitus	16	13.5%

Table 3: Service stresses

Serial no	Some Specific Risks Factors Related To Naval Service (Obtained through candid comments)	Number of cases
1	Transition from rural to urban areas.	67
2	Poor adaptation, in big cities.	59
3	Competitive life style, limited resources and wide class disparity at different levels.	89
4	Sea service and non-stop hardship.	94
5	Lack of recreational physical activities on ships.	118
6	Presence of chain of command in close setup.	83

Table 4: Weight record of only 108 patients could be recorded

BMI* (BMI=kg/m ²)	No.	Percentage
< 18.5	7	6.48%
18.5 – 24.9	98	90.75%
25 - 29.9	3	2.77%
Total No	108*	100%

BMI CHART

18.5-24.9 Overweight = 25-29.9 Obesity = BMI of 30 or greater

*BMI Categories (15)

Underweight = <18.5 Normal weigh

DISCUSSION

Hypertension is one of the major diseases affecting the personnel of Pakistan Navy and is an impending threat to their effective performance on duty. It is one disease that has claimed many careers thereby inflicting severe blow to our professional ability and

Population however taking into account the physical fitness of active sailors, it is quite significant. In our study the major risk factor identified among seamen was stress due to difficult service conditions in the sea. Stress was found to be a major factor affecting seamen, documented in 1st scientific research in Lithuania and Latvia in 2006¹³. Likewise in a similar study, among seamen--crew members--who work on French oceanographic vessels revealed that the occupation of seamen includes specific elements regarded by Karasek as leading to a risk of stress¹⁴, this study highlights the importance of alleviating stress among seamen. Same was true with The IHPAF Study¹⁵, which showed that the prevalence of hypertension was significantly associated with occupational category and was highest among workers and lowest among upper-level executives... In our study lower ranks (sailors & CPOs) were found to be the most affected.

A study carried out on 435 seafarers from Feb 1985 to Aug 1999 in eight Shanghai seagoing vessels revealed smoking (80%) and alcohol

consumption (85.3%) as the main risk factors for hypertension²⁰, however, in our study the incidence of these risk factors was very low because of service restrictions and social/religious reasons. One study carried out in Paris, France¹⁴, concluded smoking (38.1%) and sedentary life style (62.3%) as the major contributing risk factors which was very close to our study. Sedentary life style has also been claimed to be the major risk factor for hypertension in Asian countries, documented in another study, conducted at preventive cardiology medical hospital and research center Muradabad, India⁸. Our Navymen are frequently required to move around in the sea during which they have lack of leisure-time physical activity due to limited space on ships however they continue to use high caloric diet (>3000 Cals per day approx) exposing them to the risk of hypertension. Hypercholesterolemia and diabetes were the other less common associated risk factors among our series and were mostly found in older age group. The incidences were close to a study conducted in France in 2001¹⁴.

There is no direct correlation of high cholesterol with raised blood pressure but it is documented as an independent associated risk factor for accelerated atherosclerosis, an invariable companion of hypertension and its raised level significantly enhances the effect of hypertension on mortality regardless of age, sex, and race¹⁶.

Environmental factors like heavy consumption of salt in diet, physical inactivity (sedentary life), are thought to contribute to the expression of the genetic determinants of increased blood pressure. High caloric diet rich in saturated fats present in egg yolk, animal fat, butter, baked foods, and margarine adversely affect the cholesterol profiles¹⁷.

High blood pressure in non-insulin dependent diabetes mellitus (NIDDM) has been documented due to insulin resistance/hyperinsulinemia which raises the blood pressure by renal sodium retention, increased sympathetic activity associated with increased vascular smooth muscle hypertrophy secondary to mitogenic action of insulin, this is often responsive to modest weight loss¹⁶.

CONCLUSION

Though most of the risk factors for essential hypertension in our series were the same as mentioned in literature, however it was observed that their effect was confounded by the presence of service related stresses in the development of hypertension.

In our study service related stress was found to be the very common risk factor among Navy men. In addition smoking, sedentary lifestyle and high caloric diet were the other major risk factors identified. The knowledge on the above risk factors is not enough and preventive interventions aimed at the alleviation of these risk factors, should be intensified on ships in order to promote health of crews. This preventive strategy is in vogue with the current consensus and recommendations^{18,19}.

RECOMMENDATIONS

1. Stress management programs to be introduced to reduce the stress and associated distress through lectures and literature.
2. Change in lifestyle to a healthier and heart friendly by shedding excess weight and performing regular physical exercises, thus improving the physical fitness & avoiding unnecessary increased medical costs associated with obesity²⁰.
3. Observe dietary modification and dietary interaction through general awareness at all levels especially when moving around in the sea.
4. Discourage smoking.

REFERENCES

1. Hamid Nasri, Know Your Blood Pressure; the Theme of world Hypertension Day 2014. Iran J Public Health. 2014 Aug; 43(8): 1154–1156.
2. Lieb W, Jansen H, Loley C, et al. Genetic predisposition to higher blood pressure increases coronary artery disease risk. Hypertension. 2013;61(5):10-11.
3. Beilin LJ. The fifth Sir George Pickering memorial lecture: epto essential hypertension: a preventable disorder of known aetiology? J Hypertens.1988;6:85-94.
4. Whelton PK, He J, Muntner P. Prevalence, awareness, treatment and control of

-
- hypertension in North America, North Africa and Asia. *J Hum Hypertens*. 2004;18(8):545-51.
5. Lacruz ME, Kluttig A, Hartwig S, Löer M, Tiller D, Greiser KH, Werdan K, Haerting J. Prevalence and Incidence of Hypertension in the General Adult Population: Results of the CARLA-Cohort Study. *Medicine (Baltimore)*. 2015;94(22):952.
 6. Ferdinand KC, Nasser SA. Understanding the importance of race/ethnicity in the care of the hypertensive patient. *Curr Hypertens Rep*. 2015;17(4):526.
 7. Sayer RD, Wright AJ, Chen N, Campbell WW. Dietary Approaches to Stop Hypertension diet retains effectiveness to reduce blood pressure when lean pork is substituted for chicken and fish as the predominant source of protein. *Am J Clin Nutr*. 2015, Jun 10.
 8. Singh RB, Suh IL, Singh VP, Chaithiraphan S, Laothavorn P, Sy RG, Babilonia NA, Rahman AR, Sheikh S, Tomlinson B, Sarraf-Zadigan N. Hypertension and stroke in Asia: prevalence, control and strategies in developing countries for prevention. *J Hum Hypertens*. 2000;14(10-11):749-63.
 9. Abdulsalam S, Olugbenga-Bello A, Olarewaju O, Abdus-Salam I. Sociodemographic correlates of modifiable risk factors for hypertension in a rural local government area of oyo state South west Nigeria. *Int J Hypertens*. 2014;2:8420-28.
 10. Yazdanpanah L, Shahbazian H, Shahbazian H1, Latifi SM. Prevalence, awareness and risk factors of hypertension in southwest of Iran. *J Renal Inj Prev*. 2015;4(2):51-6.
 11. Ivanovic B, Tadic M. Hypercholesterolemia and Hypertension: Two Sides of the Same Coin. *Am J Cardiovasc Drugs*. 2015, Jun 11.
 12. Epstein M, Sowers JR. Diabetes Mellitus and hypertension. *Hypertension*. 1992;19:403-18.
 13. Salyga J, Juozulynas A. Association between environment and psycho-emotional stress experienced at sea by Lithuanian and Latvian seamen. *Medicina (Kaunas)*. 2006;42(9):759-69.
 14. Lodde B, Jegaden D, Lucas D, Feraud M, Eusen Y, Dewitte JD. Stress in seamen and non-seamen employed by the same company. *Int Marit Health*. 2008;59(1-4):53-60.
 15. Gaudemaris R, Lang T, Chatellier G, Larabi L, Cancès VL, Maître A, et al. Socioeconomic Inequalities in Hypertension Prevalence and Care, the IHPAF Study, Hypertension. 2002;39:1119.
 16. Braunwald E, Fauci AS, Kasper DL, Hauser SL, Longo DL, Jameson JL. Hypertensive vascular disease. In Gordan H William, editor. *Harrison's Principles of Internal Medicine*; 15th ed, New York: Mc Graw-Hill medical publishing division; 2001.p.1416-17.(disorders of the cardiovascular system; part VIII)
 17. Cortan, Kumar, Collins. Blood vessels In Frederick J, Schoen and Ramzis. Cotran, editors. *Robin's pathologic basis of disease*; sixth edition, W.B Saunders Company; 1998:506-13.
 18. Lin PH, Appel LJ, Funk K, Craddick S, Chen C, Elmer P, McBurnie MA, Champagne C. The Premier intervention helps participants follow the Dietary Approaches to Stop Hypertension dietary pattern and the current Dietary Reference Intakes recommendations. *J Am Diet Assoc*. 2007;107(9):1541-51.
 19. Nolan RP, Liu S, Payne AY. E-counseling as an emerging preventive strategy for hypertension. *Curr Opin Cardiol*. 2014;29(4):319-23.
 20. Gantt CJ1, Neely JA, Villafana IA, Chun CS, Gharabaghli SM. Analysis of weight and associated health consequences of the active duty staff at a major naval medical center. *Mil Med*. 2008;173(5):434-40.

AUTHORS

- **Surg. Cdre. Dr. Javed Iqbal**
Medical Specialist
PNS Shifa Hospital Karachi
- **Dr. Muhammad Akhtar Parvez**
Assistant Professor Community Medicine
Punjab Medical College, Faisalabad

- **Dr. Muhammad Abdal**
House Officer
PNS Shifa Hospital Karachi

Submitted for Publication: 02-05-2015

Accepted for Publication: 06-06-2015

AUTHORSHIP AND CONTRIBUTION DECLARATION

Name of Author	Contribution to the paper	Author's Signatures
Surg Cdre Dr. Javed Iqbal	1 st Author	
Dr. Muhammad Akhtar Parvez	2 nd Author	
Dr. Muhammad Abdal	3 rd Author	