



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.2556181>Available online at: <http://www.iajps.com>

Research Article

**A SERIES TO DETERMINE HYPERTENSION FREQUENCY  
AND COMPARE AVERAGE SERUM HS-C REACTIVE  
PROTEIN IN HYPERTENSIVE & NORMOTENSIVE PATIENTS****<sup>1</sup>Dr. Syed Ubaid Hasnain, <sup>1</sup>Dr. Waqas Akhtar, <sup>2</sup>Dr. Kainat Arshad****<sup>1</sup>Pakistan Institute of Medical Sciences (PIMS), Islamabad, <sup>2</sup>Jinnah Hospital Lahore****Abstract:**

**Objectives:** We aimed to determine hypertension frequency among those patients who were presented at the hospital; moreover, we also aimed to compare the average hs-C-reactive protein in both normotensive and hypertensive patients presented at the hospital.

**Methodology:** We completed this comparative research at Medical Department of Sir Ganga Ram Hospital, Lahore on a total of 204 patients. All those patients who fulfilled the research inclusion criteria were made a part of this series after hospitalization. Patients also gave informed consent about the research protocols after receiving sufficient awareness about the objective of this research. They also gave information about the contact, age and name before the commencement of this research. Research himself monitored the blood pressure of every patient and categorized the patients as hypertensive (BP >140/90 mmHg) and normotensive (BP < 140/90 mmHg). The blood pressure readings were taken at two consecutive intervals. The total research sample was also divided into two groups in order to compare the hs-C-reactive protein. Patients also gave a sample of blood for blood serum screening at the laboratory of the hospital. The same pathologist assessed the blood serum report of every patient and documented the hs-C-reactive protein level.

**Results:** In the total research sample of 204 patients we divided the patients into two different age groups respectively of (40 – 50) years and (51 – 60) years. The age bracket of (40 – 50) years included 87 patients (42.65%) and age bracket of (51 – 60) years included 117 patients (57.35%). The mean age of the patients was (51.02 ± 5.88) years. In terms of gender distribution, we included 105 male (51.47%) and 99 female (48.53%) patients. There were 52 hypertensive patients (25.49%) and 152 normotensive patients (74.51%). The comparison between mean values of the hs-C-reactive protein of the hypertensive and normotensive patients was respectively calculated as (3.23 ± 0.83) mg/L and (1.58 ± 0.70) mg/L with a significant P-Value of (0.000).

**Conclusion:** In the light of research outcomes we conclude about the average hs-C- reactive protein that it is high among hypertensive patients than the control group that is normotensive patients. However, an early C Reactive Protein screening is helpful to avoid delayed management and diagnosis of hypertension among affected patients.

**Keywords:** Blood Pressure, Normotensive, Hypertensive, Hypertension, Hs-C-Reactive Protein, Blood Serum, Pathologist and Screening.

**Corresponding author:****Dr. Syed Ubaid Hasnain,**

Pakistan Institute of Medical Sciences (PIMS), Islamabad.

QR code



Please cite this article in press Syed Ubaid Hasnain et al., A Series To Determine Hypertension Frequency And Compare Average Serum Hs-C Reactive Protein In Hypertensive & Normotensive Patients., Indo Am. J. P. Sci, 2019; 06(02).

**INTRODUCTION:**

High Blood Pressure or Hypertension refers to excessive blood pressure above (140/90 mmHg). Hypertension is a chronic medical state which refers to an elevated arteries blood pressure. This increased blood pressure in the arteries increases the pumping effort of the heart than the normal load factor to maintain the optimum required blood flow among the blood vessels [1]. It has two categories known as primary or secondary hypertension. An estimate shows (90% – 95%) patients in the category of primary hypertension. It is a state of blood pressure without any obvious medical reasons. Whereas, (5% – 10%) patients belong to secondary hypertension by various associated reasons which also affect heart, arteries, endocrine system or kidneys [2]. According to the well-studied epidemiology, the hypertension is a global epidemic. A number of countries present hypertension among fifty percent old age cases who are more than sixty years of age. In the global estimation, about twenty percent of the total world population is hypertensive with a blood pressure measurement over (140/90) mmHg. Hypertension is dramatically prevalent in the patients of above sixty years of age [3]. Various efforts are also in the pipeline about the awareness spread of treatment of hypertension even than thirty percent of the population is unaware of hypertension; moreover, the majority of the unaware population is adult. Forty percent of hypertension patients do not receive proper disease management. Among total treated patient's sixty-seven percent patients do not control and maintain blood pressure under (140/90) mmHg [4].

An increased high sensitivity CRP concentration is an inflammatory indicator of the increased chance of CVD (Cardiovascular Diseases). Therefore, this may also predict progression, occurrence and development of hypertension and associated onset of CVD among patients. CRP and related risk factors may also develop the incidence of hypertension among affected patients especially in the older age group patients [5]. An author compared the average CRP among hypertensive and normotensive patients respectively as (3.26 ± 1.37) mg/L and (1.36 ± 0.26) mg/L [6]. The mean hs-CRP level in hypertensive patients was 4.29 and among normotensive average hs-CRP level was 2.43. Both the reported levels are in the safe limit that is (0.068 – 8.20), both the groups had a significant statistical difference [7]. However, this research aimed to determine hypertension frequency among those patients who were presented at the hospital; moreover, we also aimed to compare the average hs-C-reactive protein in both normotensive and hypertensive patients presented at the hospital. C Reactive Protein is a predictor of

CHD among healthy participants and it also has an association with reduced endothelium-dependant relaxation which is a risk factor of hypertensive patients. In this research, the whole effort revolves around the increased CRP that it is an independent hypertension indicator associated with VHD, IHD and cardiac attacks. A CRP regular monitoring can prevent such incidences among patients. The desired outcomes will surely be helpful for the future research trials of management of hypertension.

**METHODOLOGY:**

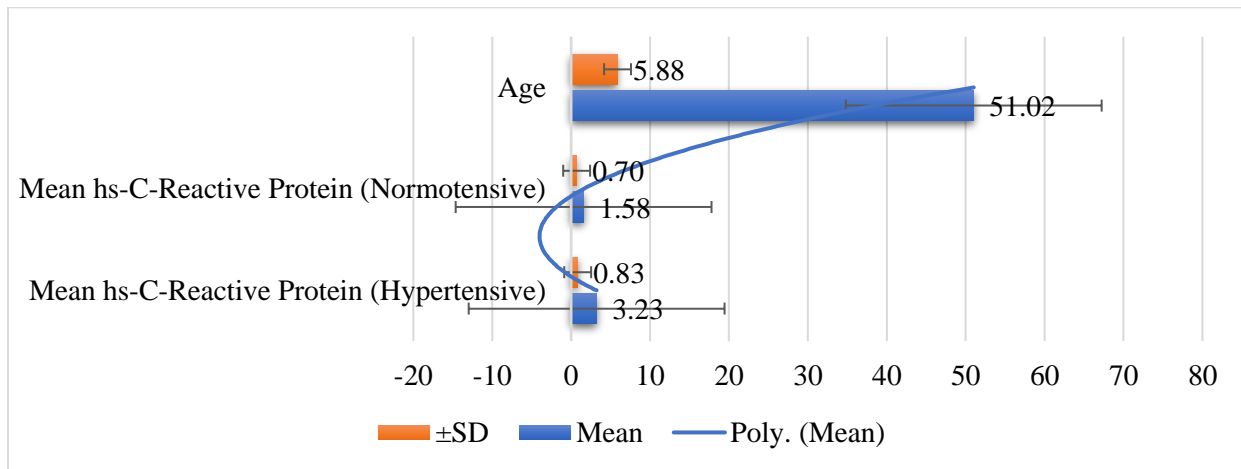
We completed this comparative research at Medical Department of Sir Ganga Ram Hospital, Lahore on a total of 204 patients. All those patients who fulfilled the research inclusion criteria were made a part of this series after hospitalization. Patients also gave informed consent about the research protocols after receiving sufficient awareness about the objective of this research. They also gave information about the contact, age and name before the commencement of this research. Research himself monitored the blood pressure of every patient and categorized the patients as hypertensive (BP >140/90 mmHg) and normotensive (BP < 140/90 mmHg). The blood pressure readings were taken at two consecutive intervals. The total research sample was also divided into two groups in order to compare the hs-C-reactive protein. Patients also gave a sample of blood for blood serum screening at the laboratory of the hospital. The same pathologist assessed the blood serum report of every patient and documented the hs-C-reactive protein level.

**RESULTS:**

In the total research sample of 204 patients, we divided the patients into two different age groups respectively of (40 – 50) years and (51 – 60) years. The age bracket of (40 – 50) years included 87 patients (42.65%) and age bracket of (51 – 60) years included 117 patients (57.35%). The mean age of the patients was (51.02 ± 5.88) years. In terms of gender distribution, we included 105 male (51.47%) and 99 female (48.53%) patients. There were 52 hypertensive patients (25.49%) and 152 normotensive patients (74.51%). The comparison between mean values of the hs-C-reactive protein of the hypertensive and normotensive patients was respectively calculated as (3.23 ± 0.83) mg/L and (1.58 ± 0.70) mg/L with a significant P-Value of (0.000). Detailed outcomes about average values, age, gender and hypertension are as under (Table – I & II);

**Table – I:** Average Values (204)

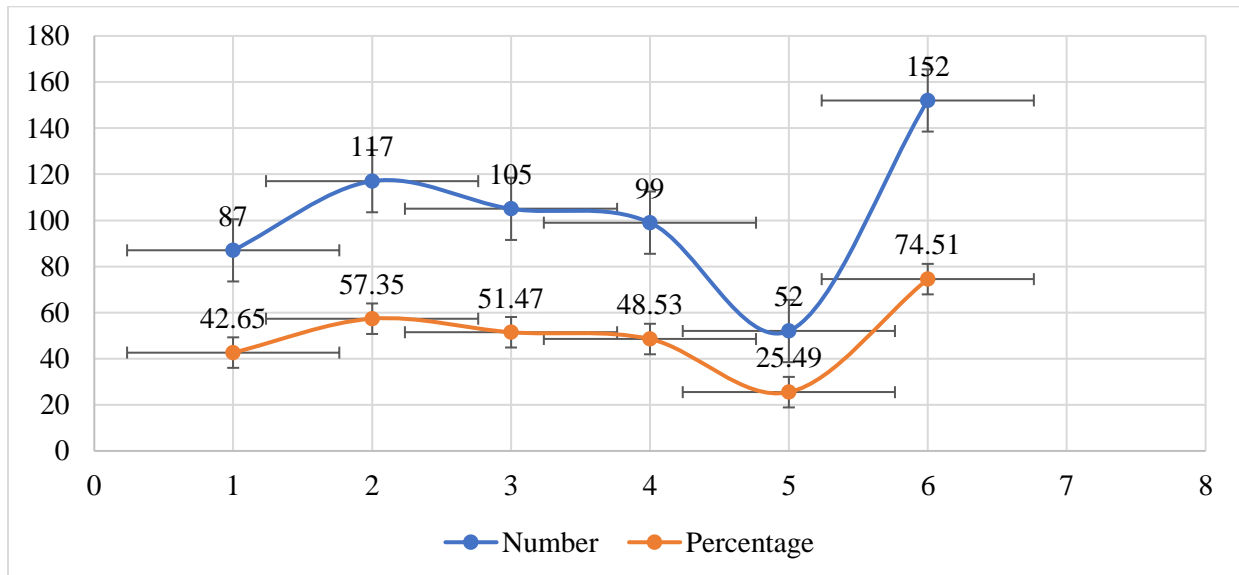
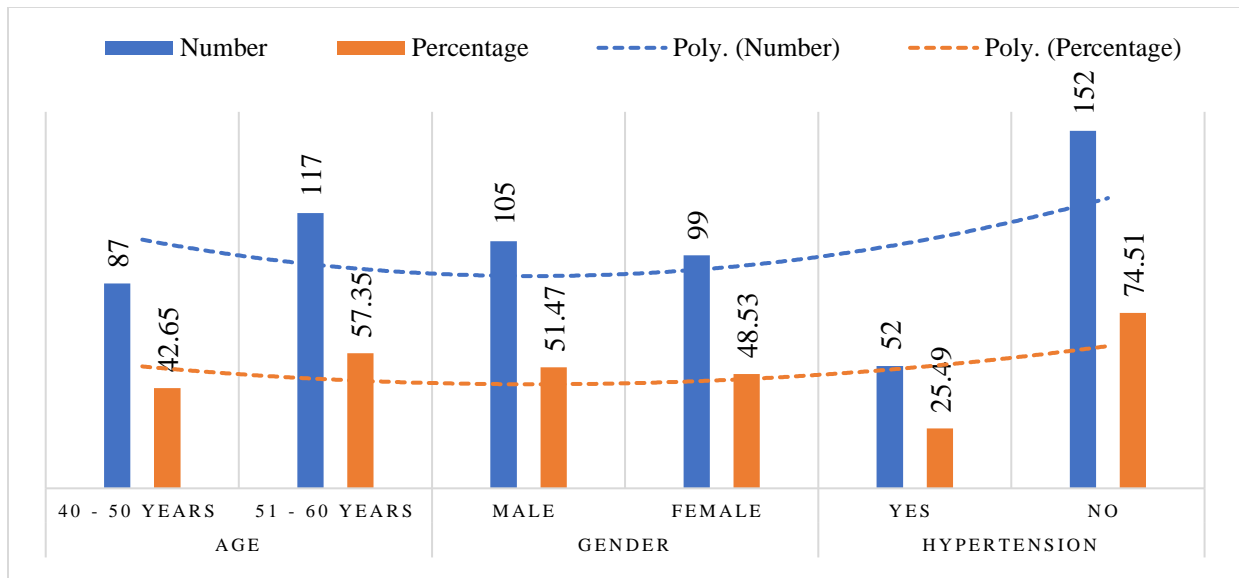
Average	Mean	±SD
Mean Hs-C-Reactive Protein (Hypertensive)	3.23	0.83
Mean Hs-C-Reactive Protein (Normotensive)	1.58	0.70
Age	51.02	5.88



Detailed age bracket distribution, male and female stratification and presence or absence of hypertension among selected patients is as under:

**Table – II:** Age, Gender & Hypertension Stratification

Age, Gender & Hypertension		Number	Percentage
Age	40 – 50 Years	87	42.65
	51 – 60 Years	117	57.35
Gender	Male	105	51.47
	Female	99	48.53
Hypertension	Yes	52	25.49
	No	152	74.51



### DISCUSSION:

The aim of this particular series is to determine hypertension frequency among those patients who were presented at the hospital; moreover, we also aimed to compare the average hs-C-reactive protein in both normotensive and hypertensive patients presented at the hospital.

In the total research sample of 204 patients, we divided the patients into two different age groups respectively of (40 – 50) years and (51 – 60) years. The age bracket of (40 – 50) years included 87 patients (42.65%) and age bracket of (51 – 60) years included 117 patients (57.35%). The mean age of the patients was (51.02 ± 5.88) years. In terms of gender distribution, we included 105 male (51.47%) and 99

female (48.53%) patients. There were 52 hypertensive patients (25.49%) and 152 normotensive patients (74.51%). The comparison between mean values of the hs-C-reactive protein of the hypertensive and normotensive patients was respectively calculated as (3.23 ± 0.83) mg/L and (1.58 ± 0.70) mg/L with a significant P-Value of (0.000). Another research reported the similar outcomes of increased hs-CRP average level among hypertensive and normotensive patients with respective levels of (3.26 ± 1.37) mg/L and (1.36 ± 0.26 mg/L) [6]. The mean hs-CRP level in hypertensive patients was 4.29 and among normotensive average hs-CRP level was 2.43. Both the reported levels are in the safe limit that is (0.068

– 8.20), both the groups had a significant statistical difference and these levels are also concurrent with the outcomes of our research [7]. In another study, the serum hs-C-reactive protein was a strong predictor of hypertension among normotensive or pre-hypertensive subjects than another inflammatory indicator like angiotensin II, TNF- $\alpha$  and interleukin VI [8].

With the given hs-CRP serum role in the hypertension, various authors have also studied hypertension effects on the levels of hs-CRP serum, hypertension prevention and associated complications. The use of Valsartan reduces the levels of hs-CRP and blood pressure [9]. Statins and Aspirin also pose similar effects on hypertension but there is still more effort required to prove this claim.

There is a scarcity of literature availability which explains and demonstrates the direct effects of hs-C-reactive protein serum to control, reduce and improve the onset of CVD among patients. Reduced cardiovascular diseases are also associated with interventions such as control of overall body weight, quitting of the smoking of cigarettes, use of statins and Aspirin. The hs-C reactive protein serum levels also indicate an indirect role in the reduction of hs-CRP among patients.

The research outcomes of this particular research are comparable with the outcomes of abovementioned research studies. In this research, the whole effort revolves around the increased CRP that it is an independent hypertension indicator associated with VHD, IHD and cardiac attacks. A CRP regular monitoring can prevent such incidences among patients. The desired outcomes will surely be helpful for the future research trials of management of hypertension.

### CONCLUSION:

In the light of research outcomes, we conclude about the average hs-C- reactive protein that it is high among hypertensive patients than the control group that is normotensive patients. However, an early C Reactive Protein screening is helpful to avoid delayed management and diagnosis of hypertension among affected patients.

### REFERENCES:

1. Naghshtabrizi B, Mozayanimonfared A, Emami F, Dadras F, Gharakhani M. A Comparative Analysis of the Level of Highly Sensitive C-Reactive Protein in People with and without Hypertension. *Iranian Heart J.*2012;13(3):27-32.
2. Boos CJ, Lip GYH. Is hypertension an inflammatory process? *Current pharmaceutical design.* 2006;12(13): 1623-35.
3. Ridker PM, Danielson E, Rifai N, Glynn RJ.

Valsartan, blood pressure reduction, and C reactive protein, primary report of the Val-MARC trial. 2006;48(19):73-9.

4. Kaplan NM. Systemic hypertension: Treatment. In: Bonow RO, Mann DL, Zipes DP, Libby P, eds. *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine.* 9th ed. Philadelphia, Pa: Saunders Elsevier 2011; chap 46.
5. Xu T, Ju Z, Tong W, Hu W, Liu Y, Zhao L. Relationship of C-reactive protein with hypertension and interactions between increased c-reactive protein and other risk factors on hypertension in Mongolian people, China. *Circ J* 2008; 72:1324–8.
6. Dar MS, Pandith AA, Sameer AS, Sultan M, Yousuf A, Mudassar S. hs-CRP: A potential marker for hypertension in Kashmiri population. *Indian J ClinBiochem*2010;25(2):208-12.
7. Victor, RG. Systemic hypertension: Mechanisms and diagnosis. In: Bonow RO, Mann DL, Zipes DP, Libby P, eds. *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine.* 9th ed. Philadelphia, Pa: Saunders Elsevier;2011: chap 45.
8. Goldstein LB, Bushnell CD, Adams RJ, Appel LJ, Braun LT, Chaturvedi S. Guidelines for the primary prevention of stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke* 2011; 42:517-84.
9. O'Brien E, Beevers DG, Lip GYH. *ABC of hypertension.* London: BMJ Books 2007.