IJAPC

Volume 11 Issue 2,
2019

www.ijapc.com

2350-0204

GREENTREE GROUP PUBLISHERS

Int J Ayu Pharm Chem

REVIEW ARTICLE

www.ijapc.com

e-ISSN 2350-0204

Effect of Seasonal Variation on Blood Pressure - A Review

Anurag Singh Gautam[1*] and Ashutosh Kumar Pathak[2]

[1-2] Department of Rachana Sharir, Faculty of Ayurveda, IMS, B.H.U, India

ABSTRACT

Seasonal variations in cardiovascular diseases shows a ratio of winter peak and summer bottom, as reported since decades, different latitudes, ethnic groups and age strata. Mortality increases in frost months is mostly related to cardiovascular measures including heart attack, unexpected fatality, stroke and pulmonary dysfunction

“Blood pressure" usually refers to the large arterial force of the systemic circulation. The blood pressure in the transmission is mainly due to the pumping action of the heart. Abhishek Goyala, et al. shows that there are considerable differences in blood pressure (SBP/DBP) with seasonal change. In comparison to summer, blood pressure significantly increases during winter. The prevalence of cardiovascular diseases in tropical climate has essential implications for epidemiological studies. Seasonal variation should have direct or indirect effect on prevalence of hypertension. The occurrence of hypertension has partly been explained in some studies and it has been more marked in subgroups those who are living in countryside areas, old people and inhabitants who are obese.

KEYWORDS

Seasonal variation, Blood pressure, Hypertension, Cardiovascular.

Greentree Group Publishers

Received 19/04/19 Accepted 09/09/19 Published 10/09/19

INTRODUCTION

A season is a four seasonal distribution of the year that is spring, summer, autumn and winter due to changes in weather, ecology, and magnitude of daylight. Seasonal weather condition considerably influences cardiovascular health. During winter season various physiological changes occur, which increases blood pressure such as increased sympathetic activity, change in the coagulation profile, endothelial dysfunction thus during winter season cardiovascular morbidity and transience increases [3,4]. There are various conditions such as heat, moisture, frost and sunlight which are inversely linked with blood pressure and is the important consideration of Blood Pressure variation. Studies have shown that Blood Pressure increases with decrease in temperature. The seasonal and climatic conditions in tropical areas are very much different from those in temperate areas, with extremely hot summers and cold winters, which results in large temperature differences with respect to season. Geographical location as well as many other factors affects the capacity of the association between temperature and Blood Pressure in low middle income countries like India. In comparison to western countries which adapt the consequence of season on blood pressure, the low middle income countries are different with respect to shelter condition and other recognized harmful factors of hypertension like body weight, age and societal stress [2].

Blood Pressure deviation is a vibrant and complex event which includes short-term and long-term fluctuations resulting complex associations among behavioral and neural central or reflex influences [3]. Environmental factors might potentially control physiological mechanism implicated in blood pressure parameter which results variation in blood pressure [4, 5]. It has been concluded that seasonal change associated with blood pressure variations and level of variations in terms of mm Hg, therefore systolic blood pressure and diastolic blood pressure significantly increases during cold month[1].

Temperature and Seasonal BP Variations

Abhishek Goyala et al. in his study enrolled a total of 1600 subjects from North India in which 978 subjects were eligible for current analysis with 521 subjects in town areas and 457 subjects in countryside. Male population was 51.3%. Mean age of study people was 42.52 ± 14.48 years. Mean age in urban areas was significantly lower than rural subjects (47.21 ± 17.0 vs 38.40 ±10.21 years). Other socio-demographic characteristics were also considerably dissimilar among countryside and town

inhabitants. For example sex, schooling, livelihood, financial status, alcohol use and smoking. Fatness occurrence was 48.35% in countryside and 51.82% in town areas. Prevalence of hypertension (SBP/DBP ± 140/90 mm Hg) was 10.12% through summer season which becomes doubled (23.72%) in frost season. Incidence of hypertension for the duration of spring and post monsoon was 20.96% and 13.80% correspondingly. Systolic Blood Pressure transversely in four seasons was considerably different. Minimum SBP (mm Hg) was recorded in summer season (122.27 ± 17.30) and highest SBP was seen in frost season (131.28 ± 20.24). Mean difference among frost and summer was 9.01. Blood Pressure difference was seen in all the seasons except spring and Autumn season. SBP in spring season and post monsoon seasons were 127.28 ±19.60 and 126.97 ± 16.28 correspondingly. The diastolic blood pressure (DBP) was also considerably dissimilar for the interval of four seasons. Throughout cold season, DBP was considerably higher than summer season with a mean distinction of 5.61.DBP (mm Hg) was minimum for the duration of summer season (77.63 ± 10.87) [2].

Pragya Sinha, et al. observed Seasonal Variation in Prevalence of Hypertension in Gokulpuri, an urban slum in eastern part of Delhi. A total of 275 females of age 18-40 years were studied in summer and winter. Blood pressure was measured in two seasons, summer (May 15 to June 15) and winter (December 26 to January 26). Blood pressure was measured three times in right arm at one minute interval in sitting position. Mean Systolic Blood Pressure (SBP) was 114.35±11.74 mm Hg in summer to 125.42±11.29 mm Hg in winter. The difference of blood pressure between summer and winter was significant. Mean Diastolic Blood Pressure (DBP) is 75.78±9.47 mm Hg in summer to 82.57±8.13 mm Hg in winter. Therefore, both mean systolic blood pressure and diastolic blood pressure were higher in winter days [12].

SaharAskari, et al. studied blood pressure variations of Adult to assess individual BP in four season of the year from Tehran. The population was divided into four phases. There are 29777 individuals of age 20 to 40 years which are divided into 9979, 5923, 6151 and 7724 participants. For the duration of the ten-year study, systolic and diastolic BP was measured in each phase. Mean SBP and DBP in spring were 116.8 and 75.3 mmHg, 116.1 and 74.8 in summer, 117.4 and 75.9 in monsoon, and 119.0 and 76.3 mmHg in winter, respectively. It has been found that the mean SBP in winter season was significantly higher than summer, spring and monsoon season [10].

Mousumi Chakrabarty, et al**.** studied blood pressure measurement in winter season and its relation with cold exposure in summer season in Guwahati, Assam, India. Total 50 healthy males of age 20-40 years were included. The baseline blood pressure in summer was measured as 117 ± 10 mm of Hg; Mean Systolic Blood Pressure in winter was 119 ± 10 mm of Hg. Blood pressure was measured at 12 degree centigrade as their feet were immersed in cold water and blood pressure was recorded at 5 minutes and 10 minutes interval. It was founded that After 5 minute and 10 minutes of cold exposure 121± 10 mm of Hg and 119 ± 10 mm of Hg in summer were found. So it had been concluded that subjects with borderline hypertension are also likely to develop high BP after cold stimuli in summer season [11].

Studies have shown that blood pressure variability mostly focused either on short-term fluctuations i.e. blood pressure fluctuations within the 24-h period or on longer term changes between days or visits that may have prognostic implications. Moreover, Fedecostante *et al.* observed that temperature which is higher at outside is associated not only with lower daytime blood pressure values but also with nocturnal blood pressure decline which results high prevalence of blood pressure phenotypes such as isolated night-time hypertension and no dipping pattern, both known to have adverse projecting implications. However, no prospective studies have been regulated distinctively which address these concerns so far. The blood pressure variation between seasons in the same individuals, different individuals over different months of the year were considered for cross-sectional or retrospective analyses, thus preventing a proper assessment of the projecting significance of seasonal blood pressure variations, and concern that requires to be effectively assessed [1].

CONCLUSION

These reviews focus on the effect of seasonal variation on blood pressure. It may be founded that majority of scholars concluded that there is considerable distinction in blood pressure (SBP/DBP) by variation in season. Abhishek Goyala et al. founded that mean difference among frost and summer was 9.01 mm Hg SBP and DBP 5.61mm Hg. Pragya Sinha, et al**.** founded that mean difference among frost and summer was 11 mm Hg SBP and DBP 7 mm Hg. Sahar Askari, et al. observed that mean difference among winter and summer was 3 mm Hg SBP and 2 mm Hg DBP. Mousumi Chakrabarty, et al**.** founded that subjects with higher BP in winter season are also likely to develop high BP after cold

stimuli in summer season, mean difference among summer and winter Systolic Blood Pressure was 2 mm of Hg, mean difference among blood pressure after 5 minute and 10 minute cold stimuli are 2 mm Hg. Blood Pressure significantly increases during winter season as compared to summer. For epidemiological study this has important implications on prevalence of hypertension in tropical climate. The objective of the present note is to believe procedural aspect investigated the useful relations among seasonality and heat on blood pressure and also to make health care provider attentive of the implications of environmental factors on blood pressure in clinical and research setting and not to make a comprehensive review of the literature representing the implicative changes of seasonal blood pressure in the clinical and experimental setting.

REFERENCES

1. Modesti PA. Season, temperature and blood pressure: a complex interaction. Eur J Intern Med. 2013; 10.1016/j.ejim. 2013.08.002.

2. Goyal A, Aslam N, Kaur S, et al. Factors affecting seasonal changes in blood pressure in North India: A population based four-seasons study. *Indian Heart J*. 2017. doi:10.1016/j.ihj.2017.09.012

3. Kaur S, Midha V, Wander GS, SoniRK Garg R, Pal R. Seasonal variation in arterial blood pressure. Ann Int Med Dental Res. 2016;2:139–145.

4. Kamezaki F, Sonoda S, Tomotsune Y, Yunaka H, Otsuji Y. Seasonal variation in metabolic syndrome prevalence. Hypertens Res. 2010;33:568–572.

5. Handler J. Seasonal variability of blood pressure in California. J Clin Hypertens. 2011; 13: 856–860.

6. Fletcher RD, Amdur RL, Kolodner R, et al. Blood pressure control among US veterans: a large multiyear analysis of blood pressure data from the Veterans Administration health data repository. Circulation. 2012; 125:2462–2468.

7. Narang R, Wasir HS. Seasonal variation in the incidence of hypertension and coronary artery disease. Int J Cardiol. 1996;56:90–92.

8. Modesti PA, Bamoshmoosh M, Rapi S, et al. Epidemiology of hypertension in Yemen: effects of urbanization and geographical area. Hypertens Res. 2013;36 (August (8)):711–71.

9. Pragya Sinha, et al. Seasonal Variation in Prevalence of Hypertension: Implications for Interpretation Indian Journal of Public Health, Volume 54, Issue 1, January-March, 2010

10. Sahar Askari et al.2014 Seasonal Variations of Blood Pressure in Adults: Tehran Lipid and Glucose Study. Archives of Iranian Medicine, Vol-17, Number 6, June 2014 441-443.

11. Chakrabarty, Mousumi, et al. International Journal of Research in Medical Sciences. Int J Res Med Sci. 2017 Jul; 5(7):3111-3113.