Original Research Paper

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Measurement of Blood Pressure in Two Different Sitting Postures Among Healthy Normotensive Individuals (Between 20-55 Years) of Guwahati City

Physiology

KEYWORDS : Normotensive male, two different sitting postures, age group 20-55yrs, sphygmomanometer

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ABSTRACT

Background: *The objective of my study was to observe whether two different sitting postures have got any effect on blood pressure measurement or not.*

Method: *100 healthy normotensive male individuals (age group 20-55 years) were selected randomly from Guwahati city. At first blood pressure of each individual was measured in sitting on a chair posture by using aneroid sphygmomanometer and stethoscope. After 5 minutes blood pressure was measured in same individual in sitting on floor posture.*

Result: *Both systolic and diastolic blood pressure were found to be higher in sitting on floor than sitting on chair posture and the difference was found to be statistically significant (<0.001).*

Conclusion: *We can conclude that even if we measure BP of a patient while sitting on floor in an emergency situation we have to recheck it by conventional method (sitting on chair) for getting accurate value of the BP of the patient.*

INTRODUCTION:

Blood pressure is defined as lateralized pressure exerted by column of blood on the walls of arteries. It is known that blood pressure measurement is a huge topic of discussion. Many debates and methods have been proposed regarding the actual methods of BP measurements. Over the years various types of instruments have been used to measure blood pressure but till date the mercury sphygmomanometer is regarded as the gold standard.[5]. The measurement of blood pressure in clinical practice by the century-old technique of Riva-Rocci/Korotkoff is dependent on the accurate transmission and interpretation of a signal (Korotkoff sound or pulse wave) from a subject via a device (the sphygmomanometer) to an observer.[1]Although most common method for measuring blood pressure is palpatory, but only systolic pressure can be measured with this method.[7,11,12] Sphygmomanometry is an important clinical procedure that indirectly measures blood pressure and thereby provides information about the cardiovascular system in normal and diseased states. It estimates the blood pressure by noting the pressure that has to be applied circumferentially on the arm to occlude the blood flow in the underlying brachial artery.[2,8] Regarding the effects of various levels of mercury sphygmomanometer during BP measurements [5] and different postures like supine, sitting and standing have got any effect on BP [4] have been studied. Whether there is any difference in the systolic and diastolic blood pressure in home and office workers have also been studied. [3] The Conventional versus Automated Measurement of BP in the Office (CAMBO) study was also designed to evaluate the impact of AOBP measurement on the management of patients in routine, community-based, clinical practice.[9] Variability regarding different BP measurement first and second time in same occasion [6] and Relationship of 24-hour blood pressure mean and variability to severity of target-organ damage in hypertension have been studied already.[10]However, little information have been found in the literature regarding two different sitting postures have got any effect on blood pressure measurement or not. Therefore, this study has been undertaken.

MATERIALS AND METHODS:

Sphygmomanometer instrument and stethoscope were used for our study. The study was conducted in Guwahati city, Assam for a duration of 2 months. Hundred (100) healthy normotensive male individuals between 20-55 years were selected randomly from Guwahati city. Study was performed after obtaining full consent from them.

EXCLUSION CRITERIA:

1) Hypertension.
2) Positive family history of hypertension
3) Chronic renal disease
4) Any locomotors disorder or joint pain
5) Diabetes

The ethical clearance: The study was conducted after obtaining ethical clearance from institutional ethical committee.

Method: A total of 100 healthy normotensive male individuals who accepted to participate in the study were randomly selected. In all the individuals, I took the consent before doing the examination on them. At first, I took the conventional method for measuring the blood pressure. First of all, each individual was asked to sit on a chair. Sitting blood pressure was taken on the right arm by keeping the diaphragm of the stethoscope over the right cubital fossa which is flexed at the elbow and supported on a table. Sphygmomanometer was kept at the level of heart. The individual was asked to keep their feet flat on the ground, back was supported from behind by the chair and he was asked to remain relax during the measurement. After that, the same individual was asked to sit on the floor and after 5 minutes of sitting in that posture the blood pressure of the individual was measured again on right hand by keeping the diaphragm of the stethoscope over right cubital fossa. This time BP was measured by keeping the sphygmomanometer on the floor and the right hand is supported over the right knee joint. During both the occasions the Riva rocci cuff was at the level of heart to nullify any effect of gravity on blood pressure measurement. During the 2nd reading the calf muscles of both the legs were in touch with that of the floor and back of the individuals were not supported this time.

RESULTS:

Mean systolic BP in sitting on floor and sitting on chair postures were found as 127±11 and 121±11mm of Hg respectively. Mean diastolic BP were found as 82±7 and 75±7mm of Hg while sitting on floor and sitting on chair respectively. Values obtained in these two different sitting postures were compared by paired t-test, revealing statistically significant ($p<0.001$) difference in both systolic and diastolic BP.

TABLE 1-
BLOOD PRESSURE IN DIFFERENT SITTING POSTURE

Parameters	**Sitting on floor (Mean±SD) mm of Hg**	**Sitting on chair (Mean±SD) mm of Hg**	p-value
Systolic BP	127 ± 11	121 ± 11	<0.001
Diastolic BP	82 ± 7	75 ± 7	<0.001

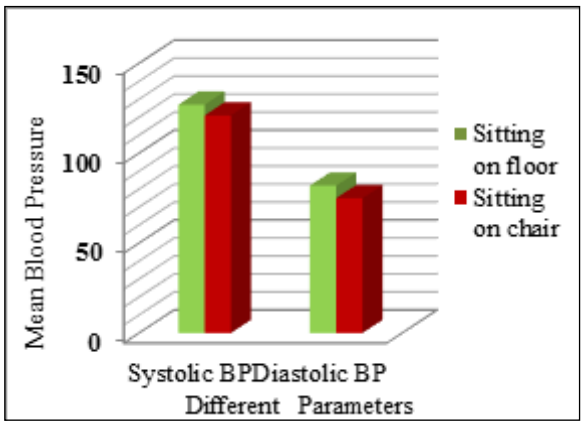

FIGURE 1: VARIATION OF BP IN TWO DIFFERENT SITTING POSTURES

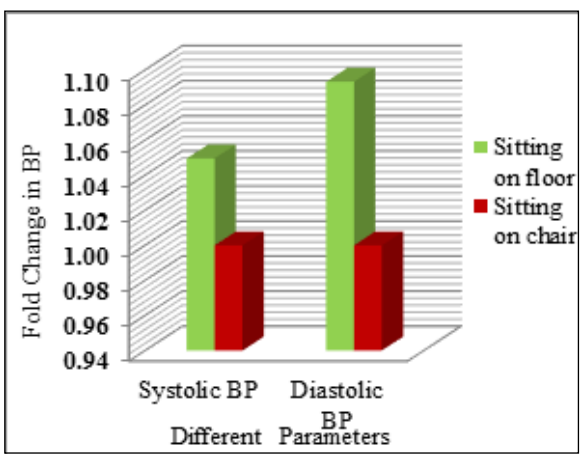

FIGURE 2: FOLD VARIATION OF BP IN TWO DIFFERENT SITTING POSTURES

DISCUSSION:

Blood pressure measurement is a huge topic of discussion. Accurate blood pressure should be known for any diagnosis related to cardiovascular system. With change in the sitting postures there is increase in the both systolic and diastolic BP.But it is found that diastolic BP is more affected than systolic BP, since fold increase in diastolic BP is more than systolic. So for accurate BP measurement along with the position of sphygmomanometer the right posture of the person should also be maintained .The conventional method of BP measurement give us the almost accurate value of the respective person's blood pressure**.**

CONCLUSION & FUTURE SCOPE:

Variation in the BP measurements in two different sitting postures is an important topic for discussion. Further studies and similar experiments with larger study groups, among known hypertensive persons, among different genders as well as ethnic comparison should be conducted to get more information related to significant variations of BP in relation to two different sitting postures.

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