COMPARISON OF AUTOMATED NON-INVASIVE BLOOD PRESSURE MEASUREMENT VS. MANUAL NON-INVASIVE BLOOD PRESSURE MEASUREMENT AMONG PATIENTS COMING FOR PRE-ANAESTHETIC EVALUATION

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ABSTRACT

Non-invasive Blood Pressure Measurement can be done by two methods. One is by using manual auscultatory sphygmomanometer and other is by automated oscillometric method. We compared both of these methods in measuring BP accurately.

METHODOLOGY

Fifty patients belonging to ASA grade I and II, aged between 18 to 65 years, who were coming to pre-anesthetic checkup were studied. They were made to rest for 15 minutes on the examination bed. Then manual mercury sphygmomanometer was used to measure first blood pressure reading by blind observer in sitting position in left arm. Three such recordings were made with 3 minutes interval in between and an average of the three was taken as the blood pressure of the patient. Then after an interval of 5 minutes, three readings of automated blood pressure was again measured in the same arm in sitting position using Philips MP20 monitor with 3 minutes interval in between.

RESULTS

The paired 't' test used to find out the statistical significance between the two groups. Statistical significance is considered when the p value is <0.05. Comparison of automated systolic BP and manual systolic BP 'p-value' < 0.001 suggesting systolic BP was over diagnosed grossly and significant. Comparison of automated diastolic BP and mean blood pressure, p value 0.934 and 0.212 respectively suggesting diastolic BP and mean blood pressure are accurate.

CONCLUSION

Systolic BP is over diagnosed with automated NIBP measurements compared with manual NIBP measurements, but there was no difference in mean BP measurements.

KEYWORDS

Automated NIBP, Manual NIBP, Pre-Anaesthesia Evaluation.

HOW TO CITE THIS ARTICLE: Venkatakrishnan, Syed Fazal Mahmood, Rammurthy. "Comparison of Automated Non-Invasive Blood Pressure Measurement vs. Manual Non-Invasive Blood Pressure Measurement Among Patients Coming for Pre-Anaesthetic Evaluation." Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 99, December 10; Page: 16444-16446, DOI: 10.14260/jemds/2015/2439

INTRODUCTION

Blood pressure measurement is an essential physiological measurement for all patients who come for pre-anaesthetic checkups in the hospital. Invasive blood pressure measurement is the most accurate method to record the blood pressure.[1] However, it is not possible to use invasive monitors in initial assessment of the patient. Other way of measuring blood pressure is Non-Invasive Blood Pressure Measurement (NIBP). NIBP can be obtained using either an automated oscillometric or manual auscultatory sphygmomanometer. Automated NIBP is one of the most extensively used method of measuring the blood pressure in the perioperative and intensive care settings.[2] The ease of use has made it more popular when compared to the manual auscultatory NIBP.

Financial or Other, Competing Interest: None.
Submission 11-11-2015, Peer Review 12-11-2015,
Acceptance 02-12-2015, Published 10-12-2015.
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DOI:10.14260/jemds/2015/2439

In this study, we assessed the accuracy of the automated non-invasive blood pressure monitor in comparison with standard manual auscultatory method using a sphygmomanometer in patients coming for pre-anaesthetic checkups.

METHODOLOGY

After obtaining approval from ethical committee, 50 patients belonging to "American society of Anesthesiology" (ASA) grade I and II, aged between 18 to 65 years, scheduled for elective surgeries who were coming to pre-anesthetic checkup were taken for the study. Once the patients are received in the Pre-Anesthetic Clinic, an informed consent was obtained from the patients. All the patients were made to rest for 15 minutes on the examination bed. Then manual mercury sphygmomanometer was used to measure first blood pressure reading by blind observer in sitting position in left arm. Palpatory method (Disappearing and reappearing of the radial pulse) was used first to detect the systolic blood pressure.

Later followed by auscultatory method, wherein the pressure level at which Korotkoff sounds is heard is taken as systolic blood pressure and the pressure level at which the Korokoff sound disappears is taken as diastolic blood pressure. Three such recordings were made with 3 minutes interval in between and an average of the three was taken as the blood pressure of the patient.

Then after an interval of 5 minutes, three readings of automated blood pressure was again measured in the same arm in sitting position using Philips MP20 monitor with 3 minutes interval in between. In both readings systolic-diastolic, mean blood pressure was noted and later statistically compared.

RESULTS

A total of 50 BP recordings were taken. The mean age group was 27.58±6.41 with 11 females and 39 males.

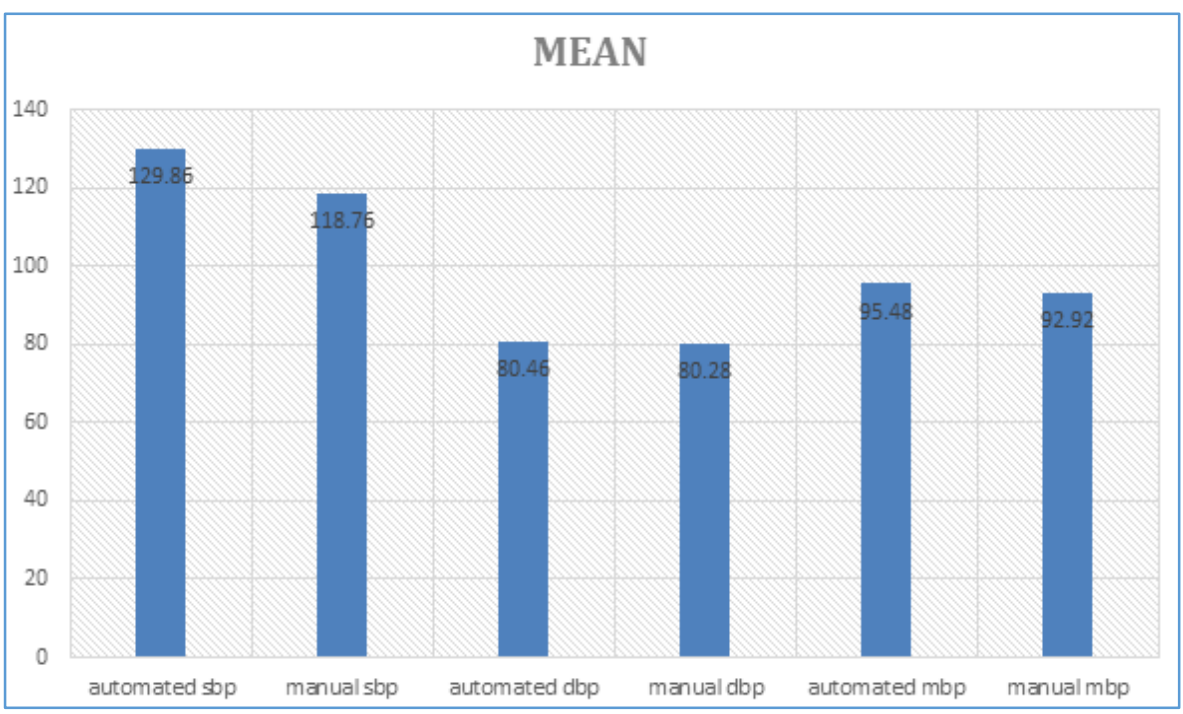
		Mean	Standard Deviation	Count	Column N %
Age		**27.58**	**6.41**		
Sex	F			11	22.0%
	M			39	78.0%

Table 1: Age and Sex Distribution

The paired 't'test used to find out the statistical significance between the two groups. Statistical significance is considered when thep value is <0.05. Comparison of automated systolic bp and manual systolic BP'p-value'< 0.001 suggesting systolic bp was over diagnosed grossly and significant. Comparison of automated diastolic bp and mean blood pressure p value 0.934 and 0.212 respectively suggesting diastolic bp and mean blood pressure are accurate.

		Mean	N	Std. Deviation	Paired Differences		t	df	P VALUE
					Mean Difference	Std. Deviation			
Pair 1	Automated sbp	129.86	50	13.166	11.1	15.367	5.108	49	<0.001
	Manual sbp	118.76	50	10.364					
Pair 2	Automated dbp	80.46	50	9.635	0.18	15.302	0.083	49	0.934
	Manual dbp	80.28	50	10.435					
Pair 3	Automated mbp	95.48	50	10.389	2.56	14.309	1.265	49	0.212
	Manual mbp	92.92	50	8.759					

Table 2: Paired 'T' Test Comparing the Measurements.



DISCUSSION

Accurate measurement of BP is important to classify individuals to ascertain blood pressure related risk and to guide management in various clinical settings.[3,4] Our study showed that systolic BP is over diagnosed grossly with non-invasive blood pressure monitoring compared to manual while diastolic BP and mean blood pressure are accurate. Significant difference existed between measurements. Patients between age of 18 and 65 were included excluding patients with arrhythmia, BMI >25 or BMI <18Kg/m2, diabetic, hypertensive, pregnancy and hemodynamic unstable patients. Our study emphasizes the importance of double confirmation of blood pressure reading with manual method in a patient who found out to have high blood pressure reading before starting on any medication. Thus requires standard monitoring techniques for blood pressure in routine set up.

CONCLUSION

Systolic blood pressure is over diagnosed with non-invasive blood pressure monitoring compared to manual reading while diastolic blood pressure and mean blood pressure remains accurate.

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