

## Original Article

# Ambulatory Blood Pressure Monitoring for Ideal Blood Pressure Control : A Kenyan Retrospective Review

Anthony Gikonyo<sup>1</sup>, Caroline Irungu<sup>2</sup>, David Kanyeki<sup>2</sup>, Stephen Omondi<sup>2</sup>, Ruot Teny<sup>2</sup>, Mikhail Basem<sup>3</sup>, Boniface Musila<sup>2</sup>, Erica Cimpaye<sup>2</sup>, Lamin Jeitah<sup>2</sup>, Premanand Ponoth<sup>4</sup>, Dan Gikonyo<sup>5</sup>

Ambulatory Blood Pressure Monitoring is a useful tool for the diagnosis and monitoring of hypertension. Its use is limited due to both access to the technology and financial constraints. We present our limited experience with it to expound on its strengths and utility. We had a total of 30 studies performed between November, 2018 to August, 2019. There were 26 patients with a diagnosis of hypertension, 17 on medication and 9 not on medication. 16 tests achieved the greater than 70 % required percentage of readings over 24 hours. The results showed that of the hypertensive patients with elevated office blood pressure were controlled by ambulatory blood pressure guidelines. More research is required to understand the full potential of ambulatory blood pressure monitoring to assess control of blood pressure.

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**Key words :** Ambulatory Blood Pressure, Hypertension, ABPM.

The high initial cost of Ambulatory Blood Pressure Monitoring (ABPM) devices has precluded their widespread use in low income settings in Sub-Saharan Africa. There is little information to assess the potential clinical and public health benefits of ABPM in such settings<sup>1</sup>. Owing to the relative availability and ease of use, office BP measurement is commonly used for the assessment of BP control in patients but over the last decade, several studies have shown that out-of-office BP measurements perform better and ABPM is recognized as the gold standard<sup>2</sup>.

High prevalence of white coat hypertension existed among participants studied. Hence, ABPM should be included as part of routine work-up for newly-diagnosed hypertensive patients in order to limit the number of those who may be committed to lifelong anti-hypertensive medications with its unwanted side effects<sup>3</sup>.

### MATERIAL AND METHODS

We had a total of 30 studies performed between November, 2018 to August, 2019. There were 26 patients with a diagnosis of hypertension, 17 on medication and 9 not on medication. 16 tests achieved

Department of Cardiac Sciences, The Karen Hospital, Nairobi, Kenya.

<sup>1</sup>MRCP, FACC and Corresponding Author

<sup>2</sup>MbChb, M Med

<sup>3</sup>MbChb, Msc

<sup>4</sup>MS, Mch, FACS, FACC, FICS, FIACS, FACP

<sup>5</sup>MbChb, M Med, FACC

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### Editor's Comment :

- Blood pressure monitoring out of hospital required to achieve target blood pressures.
- In addition to home blood pressure monitoring, ambulatory blood pressure monitoring is an essential tool to confirm appropriate blood pressure control.
- It's greater availability and utilization will improve patient care.

the greater than 70 % required percentage of readings over 24 hours.

ABPM provides the average of blood pressure readings over a defined period, usually 24 hours. The device is typically programmed to record BP at 15–30 min intervals, and average blood pressure values are usually provided for daytime, nighttime and 24 hours. A minimum of 70% usable BP recordings are required for a valid ABPM measurement session. The diagnostic threshold for hypertension is at least 130/80 mmHg over 24 hours at least 135/85 mmHg for the daytime average and at least 120/70 for the nighttime average<sup>4</sup>.

We collected ABPM data over a period of 12 months. The majority of patients were either undergoing the test to confirm a diagnosis of hypertension or were hypertensive and determining blood pressure or possible white coat hypertension. There were 30 tests performed, each preceded by an office blood pressure for comparison. Each participant was monitored for 24 hours.

### RESULTS

Only 16 of the 30 tests were valid based on the

70% criteria. There were 26 patients with a diagnosis of hypertension, of these 9 were not on medication and required a confirmation of the diagnosis. There were 17 patients with hypertension on medication who required to ascertain control of the blood pressure (Table 1).

The results as seen on Table 2, illustrated that of the 17 hypertensive patients with elevated office blood pressure on medication only 2 were controlled on based on ABPM analysis. The 9 patients not on medication with a diagnosis of hypertension, 7 were either normotensive or had borderline diastolic blood pressures.

Gender	Age	Diagnosis	Office Blood Pressure	Number of Total Measurement Overall	% Succeed Overall	Average Overall	Average Awake (mmhg)	Average A Sleep (mmhg)	Dipper (Yes/No)
F	38	HTN	146/102	29	51	115/82	115/82	0/0	
F	37	NO	128/70	44	81	115/75	117/76	105/67	NO
F	51	HTN	140/80	32	68	115/78	116/79	113/74	NO
F	36	HTN	120/71	41	85	137/96	142/99	122/85	NO
M	59	HTN	141/79	29	63	136/79	138/79	125/76	NO
F	47	NO	90/85	87	63	135/89	136/90	130/82	NO
M	60	HTN	145/98	34	59	128/79	127/79	132/77	NO
M	59	HTN	131/81	36	78	120/83	122/86	112/86	NO
M	59	HTN	145/90	43	14	138/99	140/101	127/91	NO
F	70	HTN	170/110	22	24	130/85	130/84	132/86	NO
F	43	HTN	120/66	42	91	142/94	142/96	139/86	NO
F	69	HTN	119/78	22	46	131/87	135/91	121/77	NO
M	35	HTN	145/83	32	64	139/95	143/98	126/87	NO
F	31	HTN	135/98	30	70	125/84	125/86	126/77	NO
F	78	HTN	168/71	42	89	135/78	135/78	137/76	NO
F	30	HTN	142/99	29	69	120/83	125/87	107/73	NO
M	48	HTN	149/89	40	83	126/86	128/88	118/79	NO
M	46	HTN	143/93	43	93	122/86	121/87	124/81	NO
M	32	HTN	154/114	41	87	132/96	134/96	125/94	NO
M	43	HTN	158/125	43	96	131/98	132/100	127/91	NO
M	52	HTN	141/102	24	56	123/86	130/91	110/78	YES
F	22	HTN	141/93	33	73	122/81	124/84	115/72	NO
M	37	HTN	150/87	37	97	127/82	129/82	121/79	NO
F	52	HTN	169/96	34	85	140/95	141/96	136/93	NO
M	51	HTN		34	74	134/92	139/96	120/81	NO
F	66	HTN	169/92	37	22	139/75	142/78	129/64	NO
F	48	NO		42	91	108/72	110/74	101/64	NO
F	47	HTN	152/71	28	57	112/72	116/77	105/61	NO
M	32	NO	125/72	33	67	110/73	111/74	106/69	NO
M	46	HTN	167/115	43	93	138/92	141/93	127/87	NO

**DISCUSSION**

Screening blood pressure measurement significantly overestimated hypertension prevalence while failing to identify approximately 50% of true hypertension diagnosed by ABPM<sup>1</sup>. Rates of hypertension were significantly lower when measured by 24-hours ABPM (55.7%) than by office blood pressure measurement (78.4%). White coat hypertension was observed in 54 participants (68.4%)<sup>5</sup>. This is reflected in our data with only 2 of the 9 patients being screened based on elevated office blood pressure being hypertensive. This may indicate that we may be overestimating the

Medication	Office blood pressure	Ambulatory blood Pressure
Bisoprolol	146/102	115/82
Verapamil	140/80	115/78
Methyldopa	120/71	137/96
Amlodipine, Losartan	141/79	136/79
Amlodipine, Bisoprolol, lbersartan, Methyldopa, Eplerenone	145/98	128/79
Telmisartan, Amlodipine	131/81	120/83
Telmisartan, Amlodipine, Bisoprolol	145/90	138/99
Amlodipine, Losartan, Hydrochlorothiazide	170/110	130/85
Amlodipine	120/66	142/94
Valsartan, Hydrochlorothiazide, Spironolactone	119/78	131/87
Bisoprolol, Spironolactone	168/71	135/78
Losartan	142/99	120/83
Telmisartan, Amlodipine, Nebivolol, Spironolactone	158/125	131/98
Amlodipine, Nebivolol, Hydralazine, lbersartan	169/96	140/95
Bisoprolol		134/92
Losartan, Spironolactone	169/92	139/75
Telmisartan, Amlodipine, Spironolactone, Nebivolol	167/115	138/92

actual disease burden based on only office blood pressure measurements. In addition, there was suboptimal blood pressure control of patients already on medication based on the ambulatory blood pressure results. This was partially driven by the average diastolic cut off being 80mmHg.

### CONCLUSION

More research is required to understand the full potential of ABPM to assess control of blood pressure.

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