MDMOUSE: A finger blood pressure monitor consistently underestimates blood pressure compared to an Omron home blood pressure monitor

David Kountz1, Yen-Hong Kuo2, Anne Detoro2, Sabrina Luisi2, Ahmad Abu Homoud1 and Urvish Patel1
1Jersey Shore University Medical Center, USA
2Office of Research Services, Meridian Health, USA
3Rutgers University, USA

Background: Self Blood-Pressure Measurement (SBPM) is a popular approach to help manage hypertension. Increasingly, it is recognized that SBPM is a better marker for future cardiovascular complications than clinic BP and corrects for potential "white coat effect". Finger devices have not been recommended due to inaccuracies that occur because of measurement distortion with peripheral vasoconstriction, the alternation in blood pressure the more distal the site of recording, and the effect of limb position on blood pressure. MDMouse is a finger recording device developed by Cal Health, Irvine, CA. The MDMouse monitor has the added convenience of serving as a computer mouse, allowing for routine use during the workday and eliminating the inconvenience of measurement with a separate device. Data can also be stored or send to the patient’s caregiver for feedback, counseling and medication management. In 2015 we compared MDMouse to an electronic upper arm sphygmomanometer, and found it to consistently underestimate blood pressure. The purpose of this study was to investigate the accuracy of MDMouse to an upper arm home blood pressure monitor among health adults with or without controlled hypertension.

Methods: The study design was a prospective trial of healthy adult volunteers recruited to the Clinical Research Center at Jersey Shore University Medical Center. The study was approved by the Meridian Health Institutional Review Board. Subjects provided consent and participated at the same sitting. After 5 minutes of rest subjects had their blood pressures measured by MDMouse and an Omron 3 Series Upper Arm home blood pressure monitor. Blood pressures were measured in both arms using both devices. Concordance of blood pressure between the finger and arm devices utilizing the same arm within 5 mmHg was considered accurate between devices. Accommodations were made to provide follow up for patients with Stage II or higher hypertension.

Results: A total of 104 subjects were invited to participate in this study. Among them, 91 subjects provided the complete data for all blood pressure measurements. Their mean age was 52.6 years; 71% were female; 9% non-Hispanic Black, and 32% hypertensive. Overall there was poor correlation between readings, with 69.2% (95% confidence interval [CI]: [58.7%, 78.5%]) of readings for SBP and 71.4% (95% CI: [61.0%, 80.4%]) of readings for DBP were > 5mm Hg different. The majority of readings from MDMouse were lower than those from the automated cuff.

Conclusions: The finger blood pressure device consistently overestimated a finger blood pressure readings compared to an automated upper arm home blood pressure monitor. At present, MDMouse cannot be recommended for blood pressure measurement blood pressure in healthy adults.