International Journal of Cardiology Hypertension 8 (2021) 100072

Contents lists available at ScienceDirect

International Journal of Cardiology Hypertension

journal homepage: www.journals.elsevier.com/international-journal-of-cardiology-hypertension/

Correspondence

Measuring blood pressure by a cuffless device using the pulse transit time

Moharram MA et al. aimed to evaluate the SOMNOtouch NIBP device, which calculates blood pressure (BP) by using pulse transit time (PTT). They reported a mean difference of about 30 mmHg between PTT-based and intra-arterial measurements of systolic BP during heart catheterisation [3]. These data and conclusions are in contrast to several other studies, which showed offset values <6 mmHg for systolic BP in the Bland Altman plots [1,2,4,5].

The study by Moharram MA et al. suffers from several methodical weaknesses. Main concerns refer to calibration procedure in PTT measurement. To obtain accurate absolute BP values using PTT-based methods, calibration is the most critical step. Remarkably, BP measured by the two methods deviated as early as 10 min after calibration. Authors do not provide original measurements for the period between calibration and first BP measurement, which would be extremely helpful to evaluate the reason for the deviation. Furthermore, information about acute medication before catheterisation is missing. It is not clear how many data points (pulses, PTT) were processed for each time point, and how the problem with depression of pulse waves by cuff inflation at the same arm was resolved. Remarkably, the comparison between the first and the second BP measurements shows that changes in PTT-based BP (difference + 3.3 mmHg) follow the values of invasive measurement (+5.5 mmHg) closely (see table 1 in Ref. [4]). Taken together, these facts suggest that the observed deviation in the BP (PTT) is caused by calibration failure.

Declaration of competing interest

A.P. consults SOMNOmedics Company as an expert in cardiovascular physiology. He received payment for attendance of congresses and lectures.

References

[1] S. Bartsch, D. Ostojic, H. Schmalgemeier, T. Bitter, N. Westerheide, S. Eckert, D. Horstkotte, O. Oldenburg, Validation of continuous blood pressure measurements by pulse transit time: a comparison with invasive measurements in a cardiac intensive care unit, Dtsch. Med. Wochenschr. 135 (2010) 2406–2412.

[2] G. Bilo, C. Zorzi, J.E. Ochoa Munera, C. Torlasco, V. Giuli, G. Parati, Validation of the Somnotouch-NIBP noninvasive continuous blood pressure monitor according to the European Society of Hypertension International Protocol revision 2010, Blood Pres. Monit. 20 (2015) 291–294.

[3] M.A. Moharram, L.C. Wilson, J.A. Williams, S. Coffey, Beat-beat blood pressure measurement using cuffless device does not accurately reflect invasive blood pressure, Int. J. Cardiol. Hypertens. 5 (2020) 100030.

[4] A. Patzak, Y. Mendoza, H. Gesche, M. Konermann, Continuous blood pressure measurement using the pulse transit time: comparison to intra-arterial measurement, Blood Pres. 24 (2015) 217–221.

[5] J. Zachwieja, A. Neyman-Bartkowiak, A. Rabiega, M. Wojciechowska, M. Barabasz, A. Musielak, M. Silska-Dittmar, D. Ostalska-Nowicka, Comparison of cuff-based and cuffless continuous blood pressure measurements in children and adolescents, Clin. Exp. Hypertens. 42 (2020) 512–518.

Andreas Patzak*

Institute of Vegetative Physiology, Charité-Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin and Berlin Institute of Health, Berlin, Germany

* Corresponding author. Institute of Vegetative Physiology, Charité-Universitätsmedizin Berlin, corporate member of Freie Universität Berlin, Humboldt-Universität zu Berlin and Berlin Institute of Health, Charitеplatz 1, Berlin 10117, Germany.
E-mail address: andreas.patzak@charite.de.

https://doi.org/10.1016/j.ijchy.2020.100072
Received 3 November 2020; Accepted 26 November 2020
Available online 8 December 2020