Accuracy of the Microlife large–extra large-sized cuff (32–52 cm) coupled to an automatic oscillometric device

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To determine the accuracy of the large–extra large-sized (L–XL) cuff (32–52 cm) coupled to a Microlife WatchBP Office ABI blood pressure measuring device tested according to the requirements of the International Protocol of the European Society of Hypertension. The L–XL cuff tested in this study is designed to provide accurate blood pressure measurements in patients with large arms (arm circumference ≥ 32 cm) over a wide range of arm circumferences using a single 145 ± 1 × 320 ± 1 mm bladder. The evaluation was made in 33 patients with a mean ± standard deviation age of 53 ± 17 years (range: 30–96 years). Their systolic blood pressure (SBP) was 142 ± 21 mmHg (range: 110–180 mmHg), diastolic blood pressure (DBP) was 87 ± 14 mmHg (range: 62–106 mmHg) and arm circumference was 36 ± 5 cm (range: 32–50 cm). Blood pressure measurements were made in the sitting position. The L–XL cuff coupled to the WatchBP Office ABI passed all three phases of the European Society of Hypertension protocol for SBP and DBP. Mean blood pressure differences between device and observer were −1.3 ± 5.1 mmHg for SBP and −1.8 ± 5.8 mmHg for DBP. Similar device–observer differences were observed in patients divided into two subgroups according to whether their arm circumference was above or below the median in the group. These results indicate that the L–XL cuff coupled to the WatchBP Office ABI monitor provides accurate blood pressure readings in patients with large arms over a wide range of arm circumferences. *Blood Press Monit* **16:99–102 © 2011 Wolters Kluwer Health | Lippincott Williams & Wilkins.**

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Introduction

Appropriate cuff size is essential for accurate measurement of blood pressure (BP). However, recent results indicate that more than one-third of the upper arm devices sold in medical markets and electronic stores do not have any information about cuff sizes [1]. Automated sphygmomanometers for self-BP measurement are often purchased without any medical advice and the use of a standard size cuff in people with large arms may lead to inaccurate readings [2,3]. Obesity is an emerging problem in developed countries [4], and overweight and obese patients often require the use of large-sized cuffs [5]. The regular adult cuff size is too short for individuals with an arm circumference of 32 cm or larger, and many patients will have inaccurate measures of BP if BP monitors do not have correct cuff sizes [2–5]. However, even for obese patients the cuff should be tailored according to the arm circumference and several patients will require the use of an extra large-sized cuff. In patients with very large arms, measurement with a cuff of an appropriate size is often difficult in the presence of a short humerus length because the elbow end of the cuff may extend past the elbow by several centimeters. Therefore, there exists a need for a large cuff, which can provide accurate measurements in obese patients over a wide range of arm circumferences of up to 50 cm or more. The Microlife Company recently developed large–extra large-sized cuff (L–XL cuff) intended for self-BP measurement in patients with arm circumferences ranging from 32 to 52 cm. This study reports on the accuracy of this cuff coupled with the WatchBP Office ABI monitor (Microlife AG, Espenstrasse 139, CH 9443, Widnau, Switzerland) validated earlier [6], evaluated according to the 2002 protocol of the Working Group on Blood Pressure Monitoring of the European Society of Hypertension (ESH) [7].

Participants and methods

Participants were selected from outpatient clinics and wards at the University of Padova, Italy. Forty-five patients were taken into consideration based on the baseline BP until each of the required bins was filled. Twelve patients were excluded because BP ranges were complete ($n = 9$); Korotkoff sounds were of poor quality ($n = 2$) or there was atrial fibrillation ($n = 1$). Thus, the L–XL cuff coupled with the WatchBP Office ABI monitor was evaluated in 33 patients (13 women) with a mean ± standard deviation age of 53 ± 17 years (range: 30–96 years). Their systolic BP (SBP) was 142 ± 21 mmHg (range: 110–180 mmHg), diastolic BP (DBP) was 87 ± 14 mmHg

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