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## GENERAL CARDIOLOGY: HYPERTENSION, PREVENTION AND LIPIDS

**PULSE TRANSIT TIME FOR BLOOD PRESSURE MEASUREMENT UNDER POSITIVE AIRWAY PRESSURE VENTILATION**

ACC Poster Contributions

Ernest N. Morial Convention Center, Hall F

Tuesday, April 05, 2011, 9:30 a.m.-10:45 a.m.

Session Title: Secondary and Resistant Hypertension

Abstract Category: 16. Hypertension

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**Background:** Blood pressure (BP) measurement using pulse-transit time (PTT) is increasingly used to monitor cardiac patients with sleep-disordered breathing undergoing positive airway pressure (PAP) therapy. However, PAP ventilation might influence pulse wave velocity and PTT. Aim of this study was to validate BP measurement via PTT at various degrees of PAP therapy.

**Methods:** 78 patients of a cardiological sleep lab underwent PAP using 0, 4, 8 and 12 cm H<sub>2</sub>O for 10 minutes at every level and with simultaneous BP measurement using a PTT-based method (SOMNOscreen, SOMNOmedics GmbH, Germany) as well as the oscillometric method (OM) on the upper arm. Quality of signal perception was acceptable to convert PTT into BP values in 64 patients (82%).

**Results:** When comparing both methods we found no significant difference of systolic and diastolic BP. At baseline (0 cm H<sub>2</sub>O) systolic BP measured by PTT was 123 ± 14 mmHg and by OM 121 ± 14 mmHg, diastolic BP was 70 ± 10 vs. 68 ± 10 mmHg and mean arterial pressure (MAP) was 87 ± 10 mmHg vs. 86 ± 10 mmHg. Under PAP of 12 cm H<sub>2</sub>O systolic BP was 121 ± 15 vs. 120 ± 14 mmHg and diastolic BP 69 ± 11 vs. 70 ± 10 mmHg, while MAP was 86 ± 11 mmHg measured by PTT vs. 86 ± 10 measured by OM (n.s.). Mean difference was at baseline 4.1 ± 3.2 mmHg for systolic and 2.3 ± 2.2 mmHg for diastolic BP. With increasing PAP, PTT and OM measurements differed continuously up to a systolic difference of 6.6 ± 4.9 mmHg and a diastolic difference of 4.4 ± 3.5 mmHg.

According to the European standard that pretends a systolic and diastolic deviation limit of ≤ 5 mmHg ± 8 mmHg for the validation of an incoming device, measurement via PTT shows very accurate results for systolic BP up to 4 cm H<sub>2</sub>O and for diastolic BP up to 12 cm H<sub>2</sub>O.

**Conclusions:** BP values were obtained in appr. 80% of PTT-based measurement. Without PAP or with low PAP levels, there is a close agreement between OM- and PTT-based BP measurements. However, with higher PAP, differences between both methods increased.