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Comparison of high-definition oscillometry – a non-invasive technology for arterial blood pressure measurement – with a direct invasive method using radio-telemetry in awake healthy cats

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Abstract

This study compared indirect blood pressure measurements using a non-invasive method, high-definition oscillometry (HDO), with direct measurements using a radio-telemetry device in awake cats. Paired measurements partitioned to five sub-ranges were collected in six cats using both methods. The results were analysed for assessment of correlation and agreement between the two methods, taking into account all pressure ranges, and with data separated in three sub-groups, low, normal and high ranges of systolic (SBP) and diastolic (DBP) blood pressure. SBP data displayed a mean correlation coefficient of 0.92 ± 0.02 that was reduced for low SBP. The agreement level evaluated from the whole data set was high and slightly reduced for low SBP values. The mean correlation coefficient of DBP was lower than for SBP (ie, 0.81 ± 0.02). The bias for DBP between the two methods was 22.3 ± 1.6 mmHg, suggesting that HDO produced lower values than telemetry. These results suggest that HDO met the validation criteria defined by the American College of Veterinary Internal Medicine consensus panel and provided a faithful measurement of SBP in conscious cats. For DBP, results suggest that HDO tended to underestimate DBP. This finding is clearly inconsistent with the good agreement reported in dogs, but is similar to outcomes achieved in marmosets and cynomolgus monkeys, suggesting that this is not related to HDO but is species related. The data support that the HDO is the first and only validated non-invasive blood pressure device and, as such, it is the only non-invasive reference technique that should be used in future validation studies.