Conical Blood Pressure Cuffs

In veterinary medicine, oscillometric units and Doppler ultrasonography detectors are commonly used to obtain noninvasive blood pressure (BP) measurements. BP cuffs used in small animal patients are based on cylindrical cuffs for humans, who have a relatively cylindrical brachium. However, most dogs have a conical, tapering antebrachium; thus, a conical cuff would theoretically result in a better fit, less slippage, and more uniform inflation.

This study investigated the agreement between invasive BP measurements via the median sacral artery and indirect measurements using either a cylindrical or conical cuff placed at the middle third of the antebrachium in anesthetized hound-type research dogs (n = 17).

A conical cuff was designed whereby the distal border had a circumference of 80% of the proximal border circumference based on measurements taken on a subset of the dogs (n = 14) before the study. Four sets of BP measurements, paired with invasive measurements, were taken with the cylindrical cuff. The same process was repeated with the conical cuff. The cylindrical cuff met all guidelines for validation of indirect BP measurements set by the American College of Veterinary Internal Medicine. The conical cuff met most of the guidelines but failed the correlation analysis. The authors note the correlational analysis has been questioned for its appropriateness for comparison of 2 techniques evaluating a single variable. The conical cuff did not provide better agreement with invasive blood pressure measurements as compared with the cylindrical cuff, and therefore the authors do not recommend its use.

Global Commentary

I routinely perform noninvasive blood pressure measurement by the Doppler (cats and dogs) or oscillometry (dogs) method using cylindrical cuffs in patients with suspected systemic hypertension, along with CBC, chemistry, urinalysis (including urine culture and UPC), and ophthalmic examination. In confirmed hypertension cases, the presence of target organ injury (eg, ocular changes, depression and/or obtundation, proteinuria, azotemia, left ventricular hypertrophy) would warrant further investigation of the cause so that treatment could be tailored to the underlying disease. In “white coat” hypertensive cases, I usually remeasure the blood pressure 1 to 2 weeks later in a nonstressful setting (eg, in a consultation room with the owners after a 10-15–minute acclimation period), which seems to work well!—Alice Tamborini, DVM, MRCVS, DECVIM-CA (Internal Medicine)

Source