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Do foetal biometric measurements in late gestation have potential in predicting readiness for caesarean section in bitches?

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Correct assessment of readiness (puppies having reached sufficient maturity to survive extra-uterine live) for caesarean section is essential for timing elective caesarean section during late pregnancy in the bitch. Ultrasound is widely and frequently used in the clinical setting in women to measure foetal dimensions (foetal biometric measurements) such as biparietal diameter (BPD) with sufficient accuracy to plan elective caesarean sections\textsuperscript{1}. The aim of the current study was to determine whether the BPD of dog foetuses in late gestation could be used to accurately predict readiness for caesarean section by having exceeded a minimum value as had been suggested\textsuperscript{2}. The BPD of 36 English bulldog litters (227 puppies) and 79 Boerboel litters (673 puppies) were measured immediately after delivery by caesarean section at full term using an electronic digital calliper. First appearance of a dilated cervix on vaginoscopic examination confirmed a bitch being at term. Most were also weighed with an electronic scale to record birthweight. With a caesarean section all pups in a litter are delivered simultaneously and readiness for caesarean section must be determined for a litter as a whole; therefore litters and not puppies were the experimental units. The range in the minimum, median and maximum BPD were 21.09 – 47.77, 32.93 – 49.97 and 34.19 – 58.24 mm, respectively, in English bulldog litters and 18.35 – 48.74, 35.52 – 49.70 and 39.77 – 54.33 mm for Boerboel litters. Among the 36 English bulldog litters, the smallest BPD of each of 11 litters were larger than the median of each of 11 others and the smallest BPD of each of six litters were larger than the maximum of each of six others. Among the 79 Boerboel litters the smallest BPD of each of 22 litters was larger than the median BPD of another 22 and the smallest BPD of nine litters were larger than the maximum BPD of nine others. Similarly, large variation in birthweight was recorded. The mean birthweight of Boerboel and English bulldog puppies respectively was (514.65 ± 124.23, SEM = 6.62, range, 196–873, \( n = 352 \)) and (342.51 ± 67.90, SEM = 5.10, range, 132–538, \( n = 177 \)). Results of this study show that even with the most precise measurement of BPD or volumetric measurement to estimate birthweight, the variability of these parameters within breed and even within litter, close to time of spontaneous parturition, is so great in the canine foetus that it renders these methods unsuitable to predict readiness for CS. Because birthweight is well correlated with BPD and other foetal biometric measurements\textsuperscript{3}, it is speculated that they all may be too variable to be of any use in the dog.

