Ultrasonographic Assessment of Gestational Age in Rabbit

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Introduction

Although the rabbit is an important experimental model in human reproduction studies, conclusive evidence of pregnancy is difficult to obtain in this animal. Palpation under anesthesia may cause breeding errors and result in problems such as maternal or offspring death. Because of these considerations ultrasonography could be a good instrument to detect and investigate pregnancy in the rabbit (1-5).

Ultrasonography as a medical tool in Veterinary Medicine is really used for diagnosis in many animal species, whereas in rabbit production is focused in early pregnancy studies (4). An ultrasonography pregnancy diagnosis in female rabbits is made after the 7th day of pregnancy, when ultrasound given images are clear and sharp even in the blastocyte step of the embryos. This ultrasonography diagnosis method can be precise and accurate establishing the parameters or indicators units of the fetus size, this tool may be useful in rabbit production at near future when its application become widely used in a practical way, but even now the most usual way for detecting pregnancy is manual examination.

In this assay some results are show about ultrasonography investigation and measurements of embryos in-uterus in pregnant New Zealand white rabbits.

Materials and Methods

A total of 10 female rabbits of different ages (New Zealand White) were selected. An ultrasound linear array real-time trasducer (6, 8 MHz) was employed (PIE MEDICAL, 100vet). The abdomen was shaved from the costal margin to the os pubis for good sonic coupling, and the rabbits were scanned while in the dorsal recumbency. All the animals included in this experiment were lodged under the same food and reproductive management conditions. Natural mating was performed in a natural way by placing the females in companion with the males individually for 24 hours and considered it as the zero time.

Ultrasonographic study started at 4th day after mating and continued for 6 days up to the 10th day to find the earliest time of pregnancy detection. Then it was done every other days from the 10th to the 30th day individually (in the odd days, odd numbered rabbit and in the even days even ones were examined). It was found that scanning from the abdomen produced the best images as the pregnant uterus is more cranial than is shown in anatomic texts.

Once the images were clear and sharp on screen, they were kept and saved in electronic media, to be measured later. At the end of the study 1 useless rabbits were euthanized in order to measure the fetal through a surgical dissection.

Measures size records were valid after taking an ellipse figure control (standard ultrasonography data apparatus) and were: Embryonic Vesicle, Crown-Ramp Length (CRD), Biparietal Diameter (BPD), Orbital Foramen (OF), Thoracic Depth (TD), Stomach Diameter (SD), and Thoraco-abdominal Length (TL).

Results and Discussion

In 8 rabbits (80%), in the 8th days of pregnancy, embryonic vesicles (EV) were clearly seen. In this gestation step the identified images were built by round areas that were anechoic, and these images indeed permit diagnose pregnancy in this period. In each of 10 rabbits, ultrasound has accurately predicted pregnancy with no false negatives or positives. In the same day, on 8th day of gestation, it was possible to identify two hypoecoic structures in the inner part of vesicles that correspond to the placenta formation and the embryo. In 4 rabbits, fetal parts budding were clearly identified at the 12th day and in the rest it they were seen at the 15th. Heart beating was able to be noticed on the 11th day in all cases whereas the heart could be seen as a differentiated organ on the 18th day in 8 cases and on the 19th in the others. The best day for counting the number of the fetuses seemed to be on the 11th day of pregnancy.

Fig. 1 Mean values±SD of the embryonic vesicle (EV) in the duration of measurement.
As Ypsilantis (1999) showed the above data let us determine the gestational age of internal products and demonstrated the ability to make diagnosis as early as at 8 days of pregnancy, which is important in rabbit production, because it is possible to know the number of carried embryos and finally to establish standard data in rabbit production to evaluate the gestation age but he has introduced the 7th day as the starting point of pregnancy detection. In contrast to this project, it is important to say that Ypsilantis has just measured the embryonic vesicle in New Zealand white rabbits.

It was found that ultrasonography provides a useful assessment of gestation in the rabbit, and that this is a valuable technique when such knowledge is crucial to experimental models and also the use of ultrasound test in rabbits is an alternative method of pregnancy diagnosis in rabbits. At the 8th day of pregnancy, diagnosis can be obtained by ultrasound tests.

Regarding to the result of this study, some morphometric values were provided by which the gestational age could be estimated in this breed.

**References**