Ministry of Higher Education and Scientific Research
University of Al-Qadisiya
College of Veterinary Medicine

USE OF ULTRASONOGRAPHY FOR PREGNANCY DIAGNOSIS IN LOCAL AWASSI SHEEP

A Research Project
Submitted to the council of Department of the Surgery and Obstetrics College of Veterinary Medicine/ University of Al-Qadisiyah in Partial Fulfillment of the Requirements for the Degree of Bachelor in Veterinary Medicine & Surgery

By

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بسم الله الرحمن الرحيم

وَقُلْ رَبِّ زِدْنِي عِلْمَاً

صَدَقَ اللهُ العَلِّيُ العَظِيمِ

سورة طه (١١٤)

Certificate of Instructor

We certify that ***DUAA MOHAMMED HASSAN*** has completed the fulfillment of her graduation project entitled ***USE OF ULTRASONOGRAPHYFOR PREGNANCY DIAGNOSIS IN LOCAL AWASSI SHEEP***

for the year 2016/2017 under our construction.

Instructor

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Dr. MuthannaHadiHussain

2017

Certificate of supervisor

I certify that ***DUAA MOHAMMED HASSAN*** has completed the fulfillment of her graduation project entitled ***USE OF ULTRASONOGRAPHYFOR PREGNANCY DIAGNOSIS IN LOCAL AWASSI SHEEP*** for the year 2016/2017 under my construction.

Assist. Prof.

Dr. KHALID MOHAMMED KARAM

2017

ABSTRACT

The present study was conducted to determine the earliest stage of gestation at which pregnancy could be detected through trans-abdominal ultrasonography, to describe development characteristics of pregnancy from day 26 to day 60 of gestation, and to assess the accuracy of flock pregnancy diagnosis on day 75 after ram introduction in “Awassi sheep”. A real time B-mode ultrasound scanner equipped with a 3.5 MHz probe was used for this purpose. A 100% accuracy of the pregnancy diagnosis was achieved at day 42 of gestation. Placentomes and leg buds were visible in 100% cases between 45 and 50 days of gestation, and vertebral column was apparent in 100% ewes between 51 and 55 days of gestation. Accuracy of flock pregnancy diagnosis was assessed by once only ultrasono- graphy at 75^{th}day after introduction of ram in 71 ewes over two breeding seasons. Flock pregnancy test performed at this day was 97% accurate.

INTRODUCTION

Early diagnosis of pregnancy in livestock is useful to make culling / rebreeding decisions, for food allotment, and clinical and research purposes. Traditional methods for pregnancy diagnosis in small ruminants are palpation through external abdomen and noting udder enlargement. However, these methods are applicable only in late pregnancy. The technique of trans-abdominal ultrasonography has been used with great accuracy as a means for pregnancy diagnosis and estimation of fetal numbers in sheep (Buckrell, 1988; Garcia *et al.,* 1993), goat (Martínez*et al.,* 1998; Gonalez*et al.,* 2004), deer (Revol and Wilson, 1991), and reindeer (Vahtiala*et al.,* 2004). However information in this regard is meager on sheep and goats in developing countries. The Present study was designed: (i) to determine the earliest stage of gestation at which pregnancy could be detected through trans-abdominal ultrasonography, (ii) to describe development characteristics of pregnancy up to day 60 of gestation, and (iii) to assess the accuracy of flock pregnancy diagnosis on day 75 after ram introduction in “Awassisheep” of Iraq.

MATERIALS AND METHODS

Animals

The study was conducted on mixed age Awassi ewes maintained at the Animal housing of the College of Veterinary Medicine - University of Al-Qadisiyah and private clinic. Breeding was carried out with two fertile rams starting from the last week of September. Rams were separated from the flock after two months.Observations were made for two years i.e. 2015 and 2016 (year 1 and 2).

Ultrasonography

A real time B-mode ultrasound scanner equipped with a 3.5 MHz probe (EDAN DUS 6 Vet, CHINA) was used for diagnosing pregnancy. Food and water were withheld overnight for 12 hours before scanning early in the morning. Scanning was performed in the fleece–less inguinal region of the animal.

The animal was lightly restrained by one person against railing in standing position. One of the hind legs of the ewe was folded up at the time of scanning for proper placement of the probe. An ultrasound coupling gel was applied each time to the probe to develop good contact and to remove air between probe and animal skin.

Early pregnancy diagnosis and characteristics of pregnancy

This part of the study was performed during study period Eleven animals were imaged twice weekly from day 26 to day 60 following observed mating to determine the earliest day of pregnancy diagnosis. An ewe was designated pregnant by imaging apparent conceptus (anechoic, elongated structure) within uterine fluid. Accuracy of pregnancy test was determined by comparing the pregnancy status with lambing.

For the study of growth characteristics of fetus, 60 observations were available from 10 pregnant ewes. The characteristics studied included time of evidence of placentomes, legs and vertebral column.

Flock pregnancy diagnosis

The ewes were examined only once at 75^{th} day after introduction of rams. Thirty-three Awassi ewes were scanned for pregnancy in the breeding season of year 1 and 38 ewes were examined in the breeding season of year 2. Lambing was considered as confirmatory for pregnancy diagnosis.

RESULTS AND DISCUSSION

Early pregnancy diagnosis

Ten ewes were detected pregnant by day 42 of gestation(Fig.1). The eleventh one was detected non pregnant until day 60 post mating; she did not lamb and was not included in calculating accuracy of pregnancy diagnosis. Three ewes (out of ten) were detected pregnant first time at day 26-30 of gestation, 5 ewes at day 31-35, one ewe at day 36-40 and one at day 42. So, accuracy of pregnancy detection was 30% at day 26-30, 80% at day 31-35, 90% at days 36-40 and 100% at day 42 of gestation by trans-abdominal ultrasonography using a 3.5 MHz probe. External probes of frequency 3.0 to 3.5 MHz have been found most suitable to cover a wide range of stages of pregnancy in sheep (Wilkins and Fowler, 1984). A 95% accuracy in the diagnosis of pregnancy from 40 to 50 days has been reported using a 3 MHz probe (Fowler and Wilkins, 1984).

Characteristics of pregnancy

The chronological sequence of ultrasonographic observations of placentomes, leg buds and vertebrae are shown in Table 1 and Fig. 2. Placentomes and leg buds were visible in 100% cases between 45 and 50 days of gestation, and vertebral column was apparent in 100% ewes between 51 and 55 days of gestation. Russel (1989) reported that placentomescould be identified from about day 40 as echoic circular structures in sheep.

Flock pregnancy diagnosis

The results of flock pregnancy test conducted 75 days after introduction of ram are presented in Table 2.

The accuracy of pregnancy diagnosis at this stage as confirmed by lambing over two years was 97%. The lambing dates and service records revealed that 97% of ewes conceived within 27 and 34 days after introduction of rams in year 1 and 2, respectively. One of the ewes received three services to become pregnant on day 54 after ram introduction during year 1, and one of the young ewes was served 48 days after ram introduction during year 2. Both of these animals lambed later on, however they were diagnosed non pregnant at 75 days after ram introduction. According to Buckrell (1988), majority of pregnant ewes are at the ideal stage for an ultrasound evaluation at 75 days from first introduction of the ram to the flock. Russel (1989) recommended that a flock should be scanned from 80 to 105 days after the beginning of mating, as majority of ewes will be mated within 35 days. This finding is in agreement with the present study where 97% of the Awassi ewes became pregnant within 34 days after introduction of ram.

It is concluded that a 100% accuracy of pregnancy diagnosis in Awassi ewes may be achieved at day 42 of gestation by trans-abdominal ultrasonography using a 3.5 MHz probe, and flock pregnancy test on Awassi ewes conducted 75 days after introduction of ram was 97% accurate.

Table 1: Development characteristics of early pregnancy in Awassi ewes observed by trans-abdominal ultrasonography.

Days post mating	Placentomes	Leg buds	Vertebral column
26-30 days	0/10 (0%)	0/10 (0%)	-
31-35 days	3/10 (30%)	0/10 (0%)	-
36-40 days	5/10 (50%)	2/10 (20%)	-
41-45 days	8/10 (80%)	6/10 (60%)	0/10(0%)
46-50 days	10/10 (100%)	10/10 (100%)	4/10 (40%)
51-55 days			10/10 (100%)

* The columns indicate = Number of ewes showing the character/total ewes examined (percent ewes depicting the character).

Table 2: Accuracy of flock pregnancy diagnosis in Awassi ewes by transabdominal ultrasonography at day 75 after ram introduction.

Years	No. of ewes scanned	Reproductive status		Accuracy $
		P/C*	NP/C**	
1	33	27/28	5/5	32/33 (97%)
2	38	29/30	8/8	37/38 (97%)

Total	71	56/58	13/13	69/71 (97%)

* P/C = declared as pregnant on day 75/ confirmed pregnant at lambing.

** NP/C = declared as non pregnant on day 75/ confirmed nonpregnant at lambing.

$ Accuracy=number of correctly diagnosed ewes at day 75/total ewes scanned (percentage).

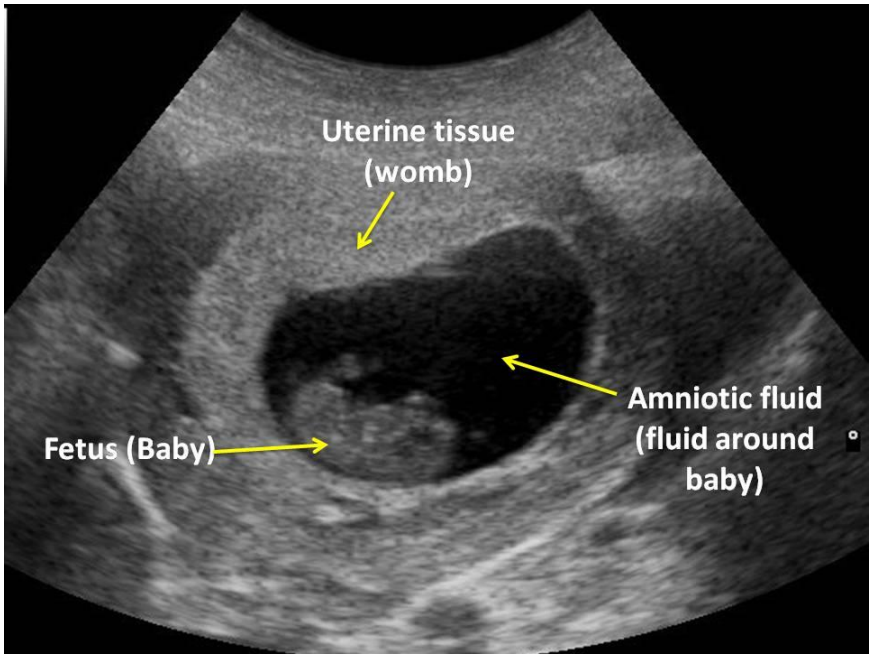

Fig.1 showing early embryo at 25 days post insemination

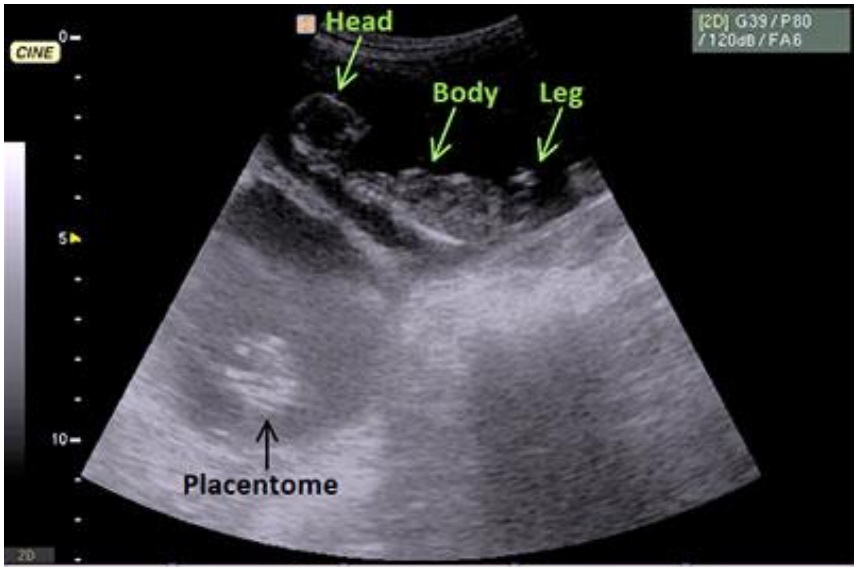

Fig.2 showing developing characteristics of fetus and placentomes at 45 days post insemination

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