

Comparison of The Bimanual, Abdominal Palpation Technique and Urine Test Kit as Methods For Pregnancy Diagnosis In Does

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ABSTRACT

This study was planned to compare the bimanual, abdominal palpation and urine test kits home made for assessment of pregnancy diagnosis and approximate stages of gestation in does. This work was performed on 30 does (2 nonpregnant and showed pathological lesions and 28 inseminated and checked for gestation stage). Out of the 28 does after 30 day's gestation, were checked by bimanual palpation technique, 22 (78.57%) of them had clear distension of the uterus, while 6 (21.42%) did not. The urine test kits showed that, 24 (85.7%) does were considered positive and 4 (14.28%) were negative (non pregnant). The results was confirmed by the date of breeding and the changes of reproductive tract were monitored at 15 day's intervals and the findings were categorized by the stage of gestation.

Study showed that the bimanual palpation technique is very effective for examining the genital tract of does. It offers a simple, effective and rapid clinical method for diagnosis early pregnancy and enables assessment of the approximate stage of gestation as well as for prediction of genital affections which is useful in fertility management in does.

Key words: bimanual palpation technique, pregnancy diagnosis in does, steroid hormone analysis in urine.

INTRODUCTION

Large proportion of small ruminants are slaughtered at various stages of gestation (1) and this is attributed to the lack of simple rapid accurate method for pregnancy diagnosis. As well as, separation of small ruminants flock into pregnant and nonpregnant allows better control of management and improved nutrition for the pregnant animals (2). In addition separation might reduce reproductive and productive losses such as abortion, still birth and weak lambs (3). Therefore, suitable method for pregnancy diagnosis is needed and must be quick and easy to carry out. It must combine the merits of safety, accuracy over a wide range of pregnancy and of low cost (4, 5). Reliable technique for early detection of pregnancy aids in culling or rebreeding of barren does and provides a valuable tool for controlled breeding program. Inability to detect early pregnancy can result in economic losses in milk and lamb production due to longer lambing intervals (6). Methods commonly used for pregnancy diagnosis in small ruminants like external abdominal palpation and palpation of cervix (7), as well as

techniques based on radiography ultrasonography and hormonal assays (8-11) and the bimanual palpation is recently developed (12-14).

Laboratory diagnosis of pregnancy in any mammal depends upon the quantitative analysis of one or more hormones in blood, urine, milk (15) and faeces (16). Steroid hormones are used for pregnancy diagnosis in does, ewes, mares and cattle (15). Of these tests, the most reliable is the quantitation of progesterone. This test is based upon the normal cyclic functioning of the mammalian ovary. After, each ovulation, a corpus luteum secretes progesterone until the doe, cow or mare is about to come into heat again. If the animal is not pregnant, the corpus luteum disappears and the progesterone concentration in blood, urine, faeces and milk become quite low. However, if the doe is pregnant corpus luteum lives throughout the pregnancy (15) and the progesterone concentration remains elevated until one to two days before kidding. Therefore, if blood or milk is assayed progesterone 19-24 days after breeding, a high progesterone concentrations means that she is pregnant, but a low progesterone means that the still is open.

Oestrogens can be used as an indicator for pregnancy diagnosis in animals species in which the foeto-placental unit is the source of large quantities of oestrogen (17). Estrone sulphate is the major estrogen produced by the concepts and can be measured in maternal plasma, milk or urine in all farm animals. The estrone sulphate levels in goats begin to rise above the highest level recorded in an unmated goat 30 to 50 days post-insemination, and this very high level continued after days 50 (18).

Steroid hormones (much smaller type of hormones) are used to detect pregnancy in does, ewes, mares, and cows (15). Steroid hormones are secreted not only by ovary, but also by the placenta (19). It has a basic or common nucleus, the cyclopentanoperhydrophenanthrene nucleus, consisting of three six-member fully hydrogenated (Perhydro-) phenanthrene rings designated A, B and C and one five membered cyclopentane ring designated D. The phenolic A ring and the substituents associated with C17 determine the biologic activity of steroid hormones (20).

The purpose of this work was to study the urine test kits home made for pregnancy diagnosis in does guided by abdominal palpation and the bimanual abdominal technique to evaluate the accuracy of gestation.

MATERIALS AND METHODS

1. Animals

Thirty Balady does 3-6 years old purchased from the local market were used in the present study. The supplied ration consisted of 1kg concentrates (cotton seed cake 65%, wheat bran 17%, rice polish 15%, common salt 1%, and lime salt 2%), in addition, Barseem (*Trifolium alexandrinum*) was supplied during the green season (November to May) in a quantity of 3kg. daily for each animal, while one kg. darris was afforded daily during the dry season. The does were marked and given numbers. Each doe was checked for pregnancy by abdominal palpation, bimanual palpation technique (13) and detection of urine steroid hormone (21). Each doe was separated

and kept in a clean box away from other animals. When signs of estrus appeared, the doe which in heat was left for mating with a buck about 8 hours. The data of mating were registered. Inseminated does were checked for pregnancy weekly by using urine test kit home made. Does that did not return to estrus after breeding were examined for pregnancy at days 30, 45, 60, 75, 105, 120 and full term by abdominal palpation, bimanual technique and urine test kit home made.

2. Methods

a-Urine test kits home made.

Urine sample was collected from each doe used immediately for detection of steroid hormone as an induction of pregnancy. The technique for detection of steroid hormone in urine was used with modification (21). Briefly, a bacteriological swabs (double jack swab) made from cotton were used after being impregnated with solution composed of one gram ferric chloride + 980 ml. D.W. + 20 ml conc. HCl or H₂SO₄. Such swabs were remaining for one month. In pregnant cases the cotton swab changed into purple within five minutes and indicating a positive result.

b-Bimanual technique.

The method includes digital palpation per rectum combined with abdominal manipulation in which the doe was restrained in standing position by an attendant holding the head. The examiner's pre-lubricated gloved index finger of the left hand and introduced into the rectum. The right palm was held vertically with the finger tips touching the ventral floor of posterior abdomen, it was then lifted upwards to move abdominal organs forward. Then using regulated forward, upward and backward movements, the reproductive tract within the pelvic cavity could be held in the palm of the right hand. The size, shape, consistency and surface characteristics of the vagina, cervix, uterine horns and adjacent structures were then assessed. Palpation of the ovaries was performed in the same manner, pressing the index finger per rectum against the right fingers. Once the uterine horns were palpated, the ovaries were easily located and palpated

lateral to the center of the coils as well as oval bodies on each side. Palpation was continued to assess their size, shape, mobility and any gross structural abnormalities. Before performing the bimanual abdominal technique the following precautions were observed : 1- Examination before feeding and watering. 2- Fecal pellets were cleared out of the rectum. 3- The distended urinary bladder was evacuated by gentle recto abdominal pressure before examination.

RESULTS

The does (n=30) examined by bimanual abdominal technique showed that, 28 had non gravid uterus, evidenced by the absence of any criteria of uterine distension and the cervix was very firm, conical and almost cartilaginous. Two does had a rough and very thick uterine wall with restricted mobility. Post slaughter verification revealed pyometra. Both ovaries could be palpated in 18 non pregnant does. Urine test kits and abdominal palpation gave negative results (Table, 1).

Table (1) Examination of does by the three different techniques (n= 30).

Diagnostic technique	Clinical examination					
	Palpated ovaries		Uterus rough and very thick wall with restricted mobility (Pathology)		absence of any criteria of distension of uterus and cervix is very firm (nonpregnant)	
	No.	%	No.	%	No.	%
Bimanual technique	18	60	2	6.66	28	93.33
Abdominal palpation	0	0	0	0	0	0
Urine kit strep	0	0	0	0	0	0

Table 2 showed the changes in the tubular genitalia along the whole gestation period using the bimanual abdominal, abdominal palpation technique and urine steroid hormone detection. Out of 28 does checked by bimanual palpation for pregnancy at day 30 after breeding, 22 does had marked distension of the uterus and were considered pregnant. The vaginal wall was relaxed and both cervix and uterus were located in pelvic cavity without any cervical hypertrophy or uterine asymmetry. The remaining 6 does had no marked distension of the uterine horns and hence were judged to be non-pregnant. However, out of 28 does checked by abdominal palpation at the same period, non of the does showed evidence of pregnant and were considered non pregnant. The urine steroid test was positive in 24 dose (pregnant) and 4 dose showed negative test.

At 45 days of gestation using bimanual abdominal technique, the vaginal wall become

slightly stretched, the cervix is located at the pelvic brim and very soft without hypertrophy but the uterus was located in front of the pelvic brim with clear distension of its wall. By abdominal palpation technique showed that, 18 does showed distension of uterus and were considered pregnant. The remaining 10 does had no market distension of the uterine wall and hence were judged to be non pregnant. Using urine test kits, 27 does gave positive results and one doe was negative .

At 60 days gestation, the clinical examination by the bimanual technique showed that moderately stretched forward vaginal wall and the cervix was slightly hypertrophied and soft but there was a marked uterinedistension with indistinguishable uterine horn, the bimanual technique, abdominal palpation and urine kit home steroid detection were positive for pregnancy 28 does.

At 75 days gestation , the vaginal wall became highly stretched forward and cervix

Table 2. The number and percentage of pregnant and non pregnant does using bimanual, abdominal palpation or urine test kits (n = 28)

Stage/ day	Bimanual palpation							Abdominal palpation				Urine kits			
	Non pregnant		Pregnant		Clinical examination of pregnant			Non pregnant		Pregnant		Non pregnant		Pregnant	
	No.	%	No.	%	Vagina	Cervix	Uterus	No.	%	No.	%	No.	%	No.	%
30	6	21.42	22	78.57	Relaxation of vaginal wall	Within pelvic cavity	Within pelvic cavity, symmetry harder in consistency	28	100	0	0	4	14.28	24	85.7
45	0	0	28	100	Slight stretching	At pelvic prim	In front of pelvic brim clear distention of uterus.	18	46.85	10	35.7	1	3.57	27	96.4
60	0	0	28	100	Stretched forward	Hypertrophied and soft	Palpation of posterior part of uterus.	0	0	28	100	0	0	28	100
75	0	0	28	100	"	"	Palpation of posterior part of uterus placentome could be paplated	0	0	28	100	0	0	28	100
90	0	0	28	100	"	"	Within the abdominal cavity fetal part and placentomes were palpated	0	0	28	100	0	0	28	100
105	0	0	28	100	"	"	"	0	0	28	100	0	0	28	100
120	0	0	28	100	Moderately stretched	In front of pelvic brim	Only posterior aspect of the uterus palpable and fetal parts, placentomes were palpated	0	0	28	100	0	0	28	100
135	0	0	28	100	Relaxation of vaginal stretching	Difficult to be palpated	Fetal part palpation within the pelvis	0	0	28	100	0	0	28	100
Full term	0	0	28	100	"	"	"	0	0	28	100	0	0	28	100

became hypertrophied and soft and the uterus within the abdominal cavity and the placenta could be palpated. With advancement of gestation starting from the 3rd month to full term, the quantitative changes in the tubular reproductive tract become obvious, the cervix was hypertrophied and soft and in front of pelvic brim from 90 to 105 days and it became difficult to be palpated. The uterus within the abdominal cavity and internal ballotment with palpation of placenta and fetal parts.

DISCUSSION

Laboratory diagnosis of pregnancy in any mammal depends upon the quantitative analysis of one or more hormones in blood, milk, urine (15) and Faeces (16). Steroid hormones are used to determine pregnancy in does, ewes, mares and cattle (15). These hormones (much smaller type of hormones) are secreted not only by the ovary, but also by placenta (18), conceptus (17). Pregnant goats can be identified by estrone level in milk and plasma at 30 to 50 days gestation (18).

The available literature dealing with the role of chemical determination of steroid hormones in urine of goats is scarce. The concept of the present study arises from the fact that the steroid nucleus, which forms color complexes in the presence of ferric ion (F^{+3}) where six molecules of the phenolic A ring of steroid nucleus combined with one atom of iron to form a complex anion (22) and during pregnancy 60-100 mg pregnandiols may be excreted in urine per day (23, 24). The results revealed that does ($n = 30$) were checked by urine kits home steroids detection for pregnancy diagnosis. The does had negative results test. However out of 28 does checked at 30 days gestation 24 (85.7%) does were considered pregnant (positive test) and 4 (14.28%) showed negative test. At 45 days gestation 27 (96.4%) does gave positive test and judged to be pregnant and one (3.57%) was negative and considered non-pregnant. At 60 days gestation urine kit home steroid detection showed that 28 (100%) does were pregnant. This is lower than that obtained in bovine (21), where 100% of pregnancy could be diagnosed at day 35 post coital from natural service by detection steroid hormone in urine.

Although the abdominal palpation technique is simple, cheap and quick, it has a low accuracy in diagnosing, specially at early stage (25), the sensitivity of abdominal palpation in small ruminant at early stage of pregnancy was low. But with progressing of the gestation the technique reaching the highest accuracy (100%) at day 85-109 after mating (9). Results revealed that out of 28 does checked by abdominal palpation technique at 30 day's gestation, zero does were considered pregnant. At 45 days gestation 10 (35.7%) does were considered pregnant and 18 (64.3%) were judged non-pregnant. But at 60 days gestation abdominal palpation technique showed that 28 (100%) does were pregnant. These results is early than recorded after 80 days (26). The highest accuracy (100%) was recorded at days 85-109 after mating (9), but coincided with that which reported at the early stage (45-80 days) the positive 2.5% pregnant in ewes, but increasing with progressing of pregnancy, it reached the highest accuracy (100%) more than 80 days in ewes (27).

Bimanual palpation technique made possible palpation of tubular genitalia of does. Palpation of both ovaries was successful. It may be useful in detection of gross structural changes like cystic enlargement, adhesion and even tumors (14). The most prominent criteria of bimanual palpation technique at 1st month is marked by uterine distension and this distension when compared with per rectum diagnosis of pregnancy in large animals, where the accuracy of diagnosis at 1st month is much lower in large animals since uterine distension is not marked at this stage compared with that in small ruminants (13). The results of this study indicated that palpation of the uterine is one of the best method together with the distension of the its wall detected by bimanual examination. At 45 days gestation, the distension of uterine wall becomes clear with slight stretching of the vaginal wall indicating the progress of gestation. A similar results were obtained in goats (12) and ewes (28). At 75 days gestation, the vaginal wall becomes highly stretched forward and the cervix become hypertrophied and soft with the uterus within abdominal cavity and placenta could be palpated. This changes indicated that the

pregnancy is progressed (9, 13, 28). With the advancement of gestation starting from the 3rd month to full term, the quantitative changes in the tubular reproductive tract become obvious, the cervix was hypertrophied and soft and in front of pelvic brim from 90 to 105 days and it become difficult to be palpated from 120 days to full term (28), the uterus within the abdominal cavity and internal ballotement with palpation of palcentome could be done from 90 to 105 days. Similar findings was also previously recorded (14, 28). Therefore, it could be concluded that the bimanual palpation technique is very effective for examining the genital tract of does. It offers a simple, effective and rapid clinical method for diagnosis of early pregnancy in does and enables assessment of the approximate stage of gestation as well as for prediction of genital affections which will be useful in fertility management.

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المقارنة بين الجس عن طريق البطن والجس عن طريق المستقيم والبطن وشريط اختبار وجود الهرمونات الاستيرودية في البول كعوامل لتشخيص الحمل في الماعز توفيق بركات

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هذه التجربة أجريت على ٣٠ ماعز تم التوثيب على ٢٨ منها وتم التحقق من فترات الحمل بواسطة شريط اختبار وجود الهرمونات الاستيرودية في البول ومقارنتها بالجس عن طريق البطن والجس عن طريق المستقيم والبطن .

وأثبتت النتائج أنه عند اليوم الثلاثون من الحمل و باستخدام طريقة المستقيم والبطن وضوح في زيادة حجم الرحم لعدد ٢٢ (٧٨,٧٥%) وأعتبرت عشاراً وأن ٦ (٢١,٤٢%) ماعز اعتبرت غير عشار بينما باستخدام شرائط الحمل وجد أن ٢٤ ماعز أعطت نتيجة إيجابية وأربع حالات أعطت نتيجة سالبة هذه النتائج تمت مقارنتها مع يوم التوثيب ثم متابعتها كل ١٥ يوم لاستبيان التغيرات والتي حدثت في فترات الحمل المختلفة .

ولقد خلصت النتائج بأن الحمل المبكر أمكن التعرف عليه بالفحص باليدين وتقدير مراحل المختلفة بالإضافة إلى استخدام شرائط الحمل للبول للتأكد من حدوث الحمل .