The validation of transrectal palpation of genital organs versus hormonal and post slaughter gross findings in bovine

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Summary

This study was conducted on sixty seven cows of different breeds and ages (non-descriptive cows). The female genital organs were examined carefully through the rectum before slaughter. Blood samples were also collected prior to slaughter to estimate the levels of progesterone and estrogen level. Gross examination of the same genital organs was approved post slaughter. A comparison has been done to assess the accuracy of rectal palpation for diagnosis of some normal and abnormal conditions. The incidence of findings in rectal palpation were 39 (58.2%) normal non-pregnant, 16 (23.88%) normal pregnant and 12 (17.91%) abnormal conditions. While the findings in gross examination were 32 (47.76%) , 18 (26.86%) and 17 (25.37%), respectively , giving a total error of 20.5% divided in to 10.04% for the normal non-pregnant cows , 3% for the normal pregnant cows and 7.46% for the abnormal conditions. In comparison hormonal levels of estrogen and progesterone were highly suggestive to the gross findings. In conclusion, the validity of rectal examination and diagnosis of various conditions in the genital organs was approximately 80%, which is not suggestive and accurate enough to compare with the hormonal and gross findings.

Key words: Rectal palpation, ovarian hormonal levels, Genital organs.

Introduction

Rectal palpation of the genital organs is usually carried out for detection of pregnancy and gynecological purpose. This approach has been experienced since decades ago (1 and 2) and yet still used since it is a quick, safe, cheap and reliable method in obtaining a satisfactory results (3).

The whole information from present experience give the impression that standard values and figures reported by previous authors does not exactly match the actual reproductive efficiency and performance of cattle (4). Rectal palpation in bovine is usually performed by veterinarians for pregnancy diagnosis and assessment of infertility. This approach needs skilled and qualified person since wrong diagnosis may cost money and reputation (5).

Slaughter houses have been used as the valuable sources for studying the pathological conditions of female reproductive tracts, which determine the causes of infertility and/or sterility (6).

The aim of this study was to focus on the validity of rectal palpation of the genital organs and to get acceptable percentage of accuracy in using such method of diagnosis in normal and abnormal conditions.

Materials and Methods

During the period from November 2012 to January 2013, sixty seven cows of different breeds and ages at Al-Qasim abattoir were examined ante mortem rectally for diagnosing different types of abnormal conditions as well as normal non-pregnant and pregnant cows according to (7). Blood samples were collected from all cows within an hour of slaughtering for estimation of estrogen and progesterone levels (8).

Gross examination of the genital tracts have been done immediately post mortem to establish the normal and abnormal condition of each organ and compare it with those results obtained from rectal palpation . Each genital tract opened longitudinally using scalpel and scissors to register all the pathological findings from the uterus to the vagina. PH of the uterine contents was assessed using Litmus or pH paper of scale from 1-12 (Johnson of Hendon LTD). Oviductal patency was achieved by passing an Indian ink into each oviduct after tying the tip of each uterine horn

(using a syringe and 18 gage needle) according to (9).

Results and Discussion

The results in (table, 1) shows that 39 out of 67 cow examined rectally were recorded as normal non-pregnant as compared to 32/67 examined grossly , this means that there is a degree of error between the sensation of the hand and the sense of vision recorded as 10.04% . Error was also recorded in pregnancy diagnosis as 3%, and in diagnosing abnormal conditions as 7.46% resulting in a total error of 20.5% in rectal palpation.

These results agreed with the results obtained by (10) while not agreed with others (11). This might be due to some such as Country, Breed, Parity, degree of nutrition, housing, diseases (12). However all the cows examined in this study were of non- descriptive history.

Table(2) showed some variations in the cervix examined pre and post slaughter in the normal non-pregnant and in pregnant cows as well as in cases of pathological conditions. The number of annular rings of the cervix were recorded grossly as 3-4 rings in all conditions. 4 rings were recorded as 77.77% in the pregnant cows as compared to 58.82 in the non-pregnant and 53.33% in the pathological conditions. However this result not agreed with the findings of (13) Who observed in Zebu cows an average number of annular rings as 4.62±0.09 perhaps due to differences in breeds or cross breeding .The higher percent of 4 rings in pregnant cows could be attributed to the tight closure of the internal and external cervical rings in order to maintain safe pregnancy. The external diameter of the cervix is nearly the same in ante and post mortem without significant difference. A relatively thick sticky mucous was manifested in the cervix of pregnant cows which may represents the mucous seal of pregnancy and yellowish brown exudates in two might be pathological conditions which originated from the metritis.

The cervix has been felt rectally in the pelvic cavity in almost all the normal and pathological conditions but in pregnant cows it was frequently stretched towards the abdominal cavity as pregnancy advance.

The table,3 showed that uterine horns were found asymmetrical in 16 cow at rectal palpation as compared to 18 examined grossly two of them were at early pregnancy. Diameter of the uterine horns near the bifurcation was almost the same in normal non-pregnant and pathological conditions , but enlargement was recorded rectally as12 in the right horn as compared to 14 in gross view since there was an early pregnancy of about 25-35 days in two cows .

The uterine wall was found thin in normal cases and almost thin in pregnant cows since it depends on the parity, stage of pregnancy, tension and quantity of fetal fluids.

In the pathological conditions the thickness was variable according to the severity of inflammation, since it was thicker in chronic conditions (9).

In rectal palpation it was difficult to feel the contents of the uterus in normal cows but it was possible to feel the fetal fluids, fetal membranes and even the fetus in most stages of pregnancy. Concerning the pathological conditions, the uterine contents were of variable texture depending on the type of exudates and thickness of uterine wall.

In gross examination, there was no significant difference in uterine contents in majority of normal cases, never the less thin sticky mucous has been detected in some of them which represents estrus mucous. The pH of uterine contents in normal cases ranged between 7-8 PH. In pregnant cows the pH was 8 in the majority and checked first before the rupture of fetal membranes. Fetal age was estimated by measuring the crown rump length (CRL) of the fetus in (cm) and applying the equation of age estimation (14). In the majority of the pathological conditions, there was no marked uterine contents, however two cases showed abnormal yellowish or yellowish brown exudates in their lumen to indicate for uterine inflammation and the PH of the contents was(9).

Table(4) showed that the number of functional corpora lutea examined rectally in the normal non-pregnant cows were 10 on the right ovary and 2 on the left ovary as compared to 12 on the right ovary and 4 on the L.O. in the pregnant cows . Only one corpus

letum (C.L) on both ovaries of the pathological samples. Obviously there is an increase in the activity of the right ovaries in both normal and pregnant cows which agree with (4). Grossly the number of CLs in normal conditions was 12 on the R.O and 4 on the L.O. which means that the validity of rectal palpation is not precisely dependable since grossly the number of CLs in the pregnant cows was also 13 on the R.O. and 5 on the L.O. compared to 12 and 4 respectively palpated rectally and these results agrees with the findings of (15). Four follicular cysts were rectally palpated on the R.O. and 2 on the L.O., Those cysts were found 6 on the R.O. and 2 on the L.O. when examined grossly depending on the precise measurement of the cyst in which its diameter is usually exceeds 2.5 cm and occur as a result of hormonal insufficiency particularly LH (16).One para-ovarian cyst, measured 3.5 cm was located beside the R.O. when viewed grossly. Obviously it was undetectable rectally. The ovaro-bursal adhesions of variable degrees were grossly detected in 3 cases on the right side and in one case on the left side as compared to one on both sides rectally. This condition occur as a result of excessive follicular hemorrhaging during ovulation, trauma of the ovary or bursa caused by rectal examination , an infection from the uterus ,or damage during calving (17). Ovaro-bursal adhesions generally do not cause reproductive problems in affected cows, unless, in severe cases, where the adhesion is so large that the fallopian tubes are blocked and fertilization of the ovum is prevented (18). Or by its effect on ovulation by masking the surface of the ovary. One case of hydro-salpinx was seen grossly on the right side since it wasn't accessible rectally.

One oviduct was found blocked since it doesn't allow the dye (ink) to pass through. A periovarian adhesion usually results from ovarian trauma or peritonitis that may lead to blocking the transport of ova from the ovaries and embryo through the tubular tract. This abnormality may also occur when some veterinarians practice manual expression of the corpus luteum and cyst rupture. Therapy with uterine lavage with an irritant fluids in large volumes may leak to the bursa and provoke an inflammatory response which, when organized, leads to adhesions. (19).

The table 5 showed that the correlation of steroid hormones with the ovarian structures were demonstrated and highlighted for validation in both rectal and gross examination.

The range of progesterone and estrogen levels in 16 normal non-pregnant cows with functional CLs was 2.8-10 n mol/ L and 57-63 p mol/L respectively , which are representative results since the level of progesterone exceeds 2 n mol/L.(9) . The absence of functional CLs in 16 normal non pregnant cows was reflected hormonally by (0.1- 1.1 n mol/L) progesterone and (39-90) p mol/L) estrogen. In the pregnant cows progesterone was estimated as 2.3-3.3 n mol/L and estrogen as (42-64) p mol/L. These results are representative to indicate functional CLs.

In cases of follicular cysts on L.O, R.O. or both ovaries progesterone levels were (0.5-0.9 n mol/L) which suggest the absence of adequate luteal cells to secrete progesterone

In conclusion the validity of rectal examination and diagnosis of genital organs in normal, pregnant and pathological conditions was nearly 80%, which is not suggestive and accurate enough to compare with the hormonal estimation and gross findings.

Table, 1: Classification of non-descriptive cows examined pre and post slaughter.

Classification of cows	No. of cows examined rectally	No. of cows examined grossly	Degree of error
Normal (non-pregnant)	**39 (58.2%)**	**32 (47.76%)**	**7 (10.04%) a**
Normal (pregnant)	**16 (23.88%)**	**18 (26.86%)**	**2 (3%) c**
Abnormal conditions	**12 (17.91%)**	**17 (25.37%)**	**5 (7.46%) b**
Total	**67**	**67**	**14 (20.5%)**

S.D. = P<0.01

Table, 2: Pre and post slaughter findings in the examination of the cervix.

	Pre slaughter (Rectal palpation)			Post slaughter (Gross examination)		
Parameters examined	Normal	Pregnant	Pathological conditions	Normal	Pregnant	Pathological conditions
No. of annular rings				3(41.17% 4(58.82%	3(22.2% 4(77.7%	3(46.6%) a 4(53.3%) b
External diameter	2-3 cm	2-3 cm	2.5-3 cm	2.5-3 cm	2.5-3 cm	2.5-3.5 cm
Contents				Non	Sticky mucous	Yellowish brown exudates(2)
Position	Pelvic cavity	Pelvic and abdominal cavity	Pelvic cavity			

S.D. = P < 0.01

Table, 3: Pre and post slaughter findings in examination of the uterus .

	Pre-slaughter (Rectal palpation)			Post-slaughter (Gross examination)		
Parameters examined	Normal	Pregnant	Pathological conditions	Normal	Pregnant	Pathological conditions
	39	16	12	32	18	17
Symmetry of horns	Symmetry	Asymmetry	Almost symmetry	Symmetry	Asymmetry	Almost symmetry
Diameter at bifurcation	2-3 cm	12 R.H larger and 4 L.H. larger	2-4 cm	2-3 cm	13 R.H. pregnancy 5 L.H. pregnancy	3-4 cm
Contents	Non	Fetal fluids and fetus 16	Almost non	Non	Fetal fluid and fetus 18	Yellowish brown exudates 2
PH of contents				7-8	8	9

Table, 4: Pre and post slaughter findings in examination of the ovaries and oviducts.

	Pre-slaughter (Rectal palpation)			Post-slaughter (Gross examination)		
Parameters examined	Normal	Pregnant	Pathological conditions	Normal	Pregnant	Pathological conditions
	39	16	12	32	18	17
No. and position of CLs	10 R.O. 2 L.O.	12 R.O. 4 L.O.	1 on both R. and L. O.	12 R.O. 4 L.O.	13 R.O. 5 L.O.	1 on both R. and L. O.
Follicular cysts			4 R.O. 2 L.O.			6 R.O. 2 L.O.
Para-Ovarian cysts						1 R. side
Adhesions			1 R. side 1 L. side			3 R. side 1 L. side
Hydrosalpinx						1 R. oviduct
Blocked oviducts						1 L. oviduct

Table, 5: A comparative aspects of hormonal levels with the ovarian structures examined grossly.

Ovarian structures	Physiological condition	Progesterone N mol/L	Estrogen Pmol/L
Pregnancy with functional CL (18)	Pregnant	2.43±1.03 a	54.16±8.42 a
Non-pregnant with functional CL (16)	Di-estrus	2.11±0.24 a	50.16±8.46 b
Non-pregnant with out functional CL (16) case	Follicular phase or N.P.S.	1.1±0.12 b	68.75±11.13 c
Pathological conditions : Follicular cysts on both ovaries 4 case		0.9 a	36 a
Follicular cyst on R.O. 3 cases		0.7 a	42 b
Follicular cyst on L.O. 1 case		0.5 a	70 c

S.D. = P<0.01
N.P.S. = No palpable structure

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فعالية الفحص عبر المستقيم للاعضاء التناسلية في الابقار بالمقارنة مع الفحص الهرموني والعياني بعد الذبح

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الخلاصة

اجري البحث على 67 بقرة ذات اعمار و سلالات غير محددة . تم فحص الاعضاء التناسلية لكل بقرة عن طريق الجس عبر المستقيم بعناية قبل الذبح ثم اخذت عينات دم من كل بقرة لغرض تحديد مستوى هرموني البرجستيرون والاستروجين . بعد الذبح تم فحص الاعضاء التناسلية لكل بقرة عيانياً ومقارنتها بسابقتها قبل الذبح وتحديد نسبة التوافق بين الفحصين . كانت نسب الحالات التي فحصت قبل الذبح هي 58.2% طبيعية و 23.88% حوامل و 17.91% غير طبيعية . اما بعد الذبح فكانت 47.76% طبيعية و 26.86% حوامل و 25.37% غير طبيعية . مما يؤكد بان نسبة الخطا بين الفحصين هو 20.5% موزعة الى 10.04% خطأ في الحالات طبيعية و 3% في الحالات الحوامل و 7.46% قي الحالات غير الطبيعية . اما نسبة هرموني البروجستيرون و الاستروجين مقنعة بالنسبة للفحص العياني. نستنتج من الدراسة ان فعالية الجس عبر المستقيم في تشخيص الحالات المختلفة كانت حوالي 80% وهي نسبة لا ترتقي الى مستوى الفحص العياني والهرموني ولا يمكن الاعتماد عليها كلياً.

الكلمات المفتاحية : جس الابقار عبر المستقيم , مستوى الهرمونات المبيضية , للاعضاء التناسلية.