

ABNORMALITIES OF REPRODUCTIVE ORGANS IN EWES: A PROSPECTIVE HISTOPATHOLOGICAL STUDY

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ABSTRACT

This study was conducted on the genital tract of 214 ewes in Basrah province. The specimens were randomly collected from Basrah slaughter house within the period from December 2003 to April 2004.

The study aimed to evaluate and describe the different types of abnormalities affecting the genital tract of ewes both grossly and microscopically. The gross examination of collected specimens was confirmed by histological examination. Pathological changes were found in 46% of the total cases.

Uterine abnormalities comprised (70%) whereas ovarian abnormalities comprised (24%) and oviduct abnormalities were (6%).The commonest pathological conditions of the uterus was endometritis which comprised (24.76%) of pathological conditions, followed by endometrial hyperplasia(2.33%) and pyometra (1.86 %).

The commonest abnormalities of the ovary are ovarian cysts (4.2%), followed by Para ovarian cysts (3.27%) and ovariobursal adhesion (2.8%).

The abnormalities of the oviduct were less common and hydrosalpinx was the commonest lesion (0.93 %).

Neither congenital nor neoplastic abnormalities were detected in this study.

The study concluded that acquired pathological conditions are the major causes of abnormalities of the genital tract, of which endometritis is the most common. Thus, the low reproductive rate of ewes may be attributed to that fact.

INTRODUCTION

A rapidly growing population is frequently associated with insufficient human nutrition and low intake of food of animal origin (1) . In Iraq Between 1990 and 1995 the number of cows declined by 34%, the number of buffaloes by 46%, the number of sheep by 42% and the number of goats by 81% (2).

The main causes of this decline are the shortage of required equipment, feed, veterinary services and vaccinations (2). In Iraq the population of sheep is around 10.800.000 million with a very low growth rate of (- 2.8 %) compared to Saudi Arabia (2.2 %), Egypt (1.4 %), Sudan (2.1 %), UAE (5.1 %), and Iran (0.2 %) (3) .

The animal diseases situation in Iraq has been aggravated by collapse of the veterinary infrastructures, disease investigation, surveillance and diagnostic services in the country (3). Sheep contribute significantly to meat, milk, and wool production in the world and Iraq especially.

The major reproductive problems of small ruminants (sheep & goat) include abortions, stillbirths, mastitis, metritis, dystocia and perinatal mortality (4). Many of these problems are associated with systemic diseases that lower the overall performance of the animal or cause fetal mortality and abortions. Diseases of the reproductive system are common problems that cause reproductive wastage (1).

The aim of this study is to find out the types of disorders affecting the reproductive organs of ewes in Basrah /Iraq.

MATERIALS AND METHODS

A total of 214 female genital tracts (ovary, oviduct and uterus) were obtained from Basrah slaughter house in the period from December 1st 2003 to April 31st 2004. This total did not include seventy pregnant ewes that were excluded from the study.

The specimens were collected three times per week. Ewes were of non-description breed, and were 1-6 years age. Details of gross examinations of collected specimens were recorded.

Samples of the lesions were fixed in 10% formol-salin for 3 days and prepared for histopathological technique (5).

Cases with more than one pathological lesion in different organs were regarded as mixed pathology conditions.

RESULTS AND DISCUSSION

Reproductive wastage due to mortality, morbidity and poor reproduction significantly reduce flock productivity and may make small ruminants rearing uneconomic (1).

In the present study the results of examining 214 specimens showed 98 abnormal cases (Fig. 1). Gross and histopathological examination of these cases showed different pathological conditions as listed in table 1.

The pathological cases which were diagnosed macroscopically comprised (56.12 %) of the total pathological conditions. The most affected part of tract was uterus which comprised 70% followed by ovary 24%, and oviduct 6% (Fig.1).

The increased pathological conditions of uterus in the present study may be attributed to the fact that the uterus is constantly influenced by many factors such as hormonal and physical effects, which may have an influence on the uterus, in addition to that, the endometrial epithelium is more easily damaged in mild inflammation than the uterine tubes or ovaries that are more resistant (8,9,10).

Congenital disorders of the genital tract were not recorded and that is consistent with others who mentioned that congenital abnormalities of the reproductive tract of sheep appear to be uncommon (11,12). Neoplasia was absent in the present study. Smith showed that tumors are very rare in sheep as only one case of tumor (granulose cell tumor) was recorded in that study (13).

Endometritis; in the present study endometritis comprised (24.76%). It was more than similar condition reported by other researchers who found (13.7%), and (2%) in Turkish ewes (7, 14). Only on the other hand our result was consistent with others who reported (24%) in Australia(15) and less than (55.7%) and (40%) in other studies(17,18).

Pathological changes of endometritis in this study were similar to the changes in goat, cow and camel (17,18). Most of endometritis in the present study were shown in the luteal phase or postpartum ewes, this is consistent with previous studies which explained that uterine immune function is suppressed during the luteal phase in ewes and cattle (20,21,22) Only a small increase in progesterone, presumably luteal, is necessary to initiate the onset of uterine infection by suppressing proinflammatory molecules and eicosanoid synthesis (23-27). Most follicular or anestrus ewes in present study didn't reveal

endometritis and this conform with many researchers who mentioned that uterine immune function is enhanced during follicular phase of ewes and cattle (28, 29, 30).

Other studies showed that during estrus, eicosanoid $\text{PGF}_{2\alpha}$ (prostaglandin $\text{F}_{2\alpha}$) and LTB_4 (leucotrien B_4) are increased and they are important to prevent infection of the uterus (9,20,31). Uterine infection may be caused by specific and non specific organisms (32). Previous studies showed that *Escherichia coli* is the most important bacteria in acute endometritis, followed by *Streptococcus* and *Staphylococcus*. *Actinomyces pyogenes* was isolated frequently with chronic endometritis and it may be combined with *E. coli* to induce endometritis (6,15,33,34). Endometritis is considered an important cause of embryonic loss by disruption of uterine tissue or by direct cytotoxicity of embryo. Absorption of bacterial component from the uterus can prevent the growth of graafian follicle and ovulation (32, 35,36,37,38,39). See figures 2 and 3

Pyometra; the incidence of pyometra (1.86%) was more than others who reported (0.8%), (0.11%) and (0.48%) (15,14,41) respectively, and consistent with (1.8%) (6). Other authors did not record pyometra in their studies in the same field (11,42,43).

Pyometra may be caused when sufficient damage of endometrium occur by endometritis and that prevent $\text{PGF}_{2\alpha}$ (prostaglandin- $\text{F}_{2\alpha}$) production to lysis corpus luteum; so, persistent production of the progesterone makes the uterus more susceptible to infection and cause functional closure of the cervix; thus, when an infection already exist in the uterus, pyometra may occur (9,20,44,45,46,47).

In two cases, cystic glandular hyperplasia was found, which may reveal that exogenous or endogenous sources of estrogen may result in pyometra (48, 49). An increased incidence of pyometra in ewes was observed with clover diseases (15, 49). See figure 4.

Hydrometra: in the present study hydrometra comprised (1.4%). It was higher than that reported in similar studies (0.6%), (0.14%), (0.9%), (0.23%), (0.34%) and (0.4%) (15,11,6,13,14,50,41 respectively).

The percentage of hydrometra in the present study was similar to that in cow (51). Small amounts of free fluid in the uterine lumen at various stages of estrus cycle occur in many species including horses (52), but it is unusual to find free fluid in uterine lumen of sheep (13).

Obstruction of the cervix which was found in one case is considered an important cause of hydrometra in the animals and women (53,54). The estrogenic stimulation (i.e. phytoestrogen) is an important cause of hydrometra in ewes and hydrometra induced in mice by estradiol administration (49).

Hydrometra has significant effect in the infertility and subfertility by the interference of intraluminal fluid, cystic glandular changes and embryotoxic substances presence in the fluid with the attachment of embryo to the endometrium and the success of pregnancy (54, 55).

Endometrial hyperplasia; in the present study (2.33%) was more than reported by others who recorded (0.36%) (14) and (0.04%) (11).

Uterine cysts were found in (0.93%) which was much lower than that reported by others of (56.5%), (5%) and (18%) respectively, who conducted their studies in common phytoestrogen areas of Australia (15,56,57).

Adenomyosis (0.93%) was much lower than other studies who reported (14%) (15). However, Acland(10) mentioned that adenomyosis is occasionally encountered in domestic animals and its effect is negligible.

Endometrial hyperplasia commonly is associated with chronic estrogenic stimulation, clover diseases, endocrine imbalance (11,58,59,60). One of toxic plants can cause uterine hypersecretion and adenomyosis (61). Phytoestrogens cause widespread clinical infertility

that is mostly unrecognized, because the reduced levels of fertility are accepted as normal (62,63).

Ovarobursal adhesions were (2.8%). They were more than many authors who reported (0.4%), who reported (2.1%), (2%) and (0.2%) (43,13,33,31), however they were consistent with that of others (2.57%) and (2.75%) (41,6). This condition in the present study was lower than in cow (51,62).

The strands between the ovary and the fimbria were regarded as ovulation tags when there is no effect on the ovulation (13,51), however others regarded them as ovaro-bursal adhesion (16,64).

Paraovarian cysts in the present study were (3.27%). They were more than that of similar condition mentioned by who reported (1.32%), (0.28%), (2.7%), (0.4%), (2.41%), (2%) and (2.48%) (42,66,11,6,43,14,33,31 respectively), but less than (5%) and (4.9%) reported by others (15,41). However, Roberts(63) showed that paraovarian cysts are less common in cows than ewes.

Cytic calculi :this condition which comprised (0.93%), was not recorded by many authors who surveyed the same field. A study described this case as calcified lesion and considered it as outcome of known lesions including abscesses, broad ligament hemorrhages, old salpingitis, tuberculosis and cambylobacteriosis(67). However, another study regarded cystic calculi as lesions of parasitic origin arising from calcification of *Cysticercus tenuicollis* cyst and from calcified paraovarian cysts(13). The significance of this lesion is in occlusion of the oviductal lumen (13).

Regarding the cases of **mixed pathology**, the persistence of extensive infection was observed to be an important characteristic. Parametritis, bilateral ovarobursal adhesions and hydrosalpinx were found in one case while the other two cases showed endometritis which had spread to oviducts causing salpingitis. Two studies considered ascending genital tract infection to cause subfertility and infertility due to salpingitis(10,68).

The association of suppurative endometritis and ovarobursal adhesion is attributed to uterine infection(12). The ovarobursal adhesion in the mixed cases produce extensive fibrous tissue which conceals the ovaries, impedes ovulation and forms luteinized follicles (12,51). We believe that this is different from the ovarobursal adhesions mentioned previously which don't interfere with ovulation.

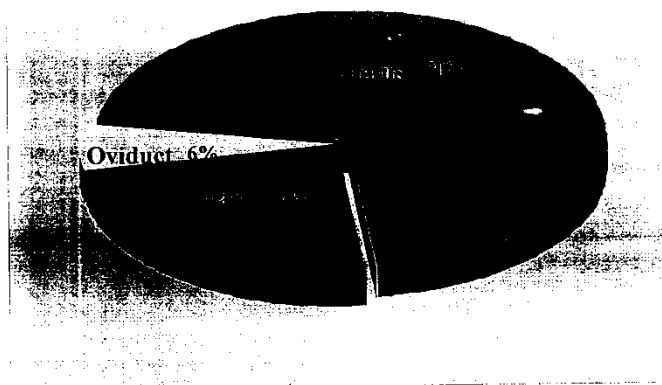


Fig.1: Frequency distribution of cases according to the organ.

Pathological conditions	number	% of path. conditions	% of total
Endometritis	53	54.0	24.76
Parametritis	1	1.0	0.46
Pyometra	4	4.0	1.86
Hydrometra	3	3.0	0.93
Endometrial Hyperplasia	5	5.1	2.33
Mummified fetus	1	1.0	0.46
Macerated fetus	1	1.0	0.46
Hydro-salpinx	2	2.0	0.93
Ovaro-bursal adhesion	6	6.12	2.8
Paraovarian cysts	7	7.14	3.27
Ovarian cysts	9	9.18	4.2
Cystic calculi	2	2.0	0.93
Mixed conditions.	4	4.0	1.86
Total	98	100%	46%

Table 1: Frequency distribution of pathological conditions.

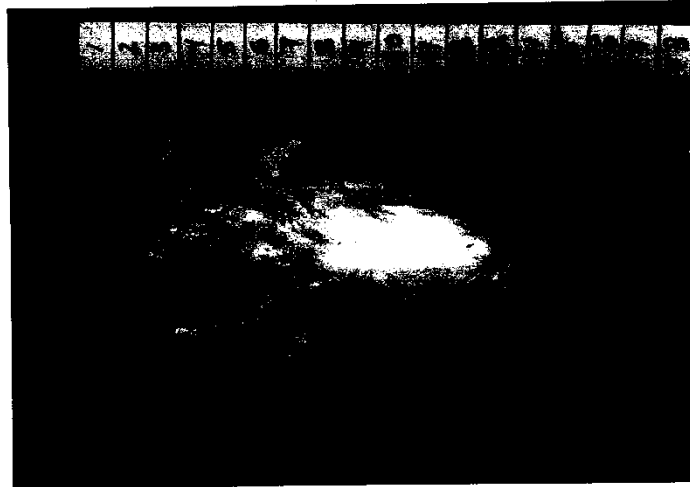


Fig.2; Uterus- Gross appearance of endometritis showing edematous thickening with congestion of the uterine wall.



Fig3; Uterus- showing acute endometritis with glandular inflammation and destruction of epithelium. (H&E X400).

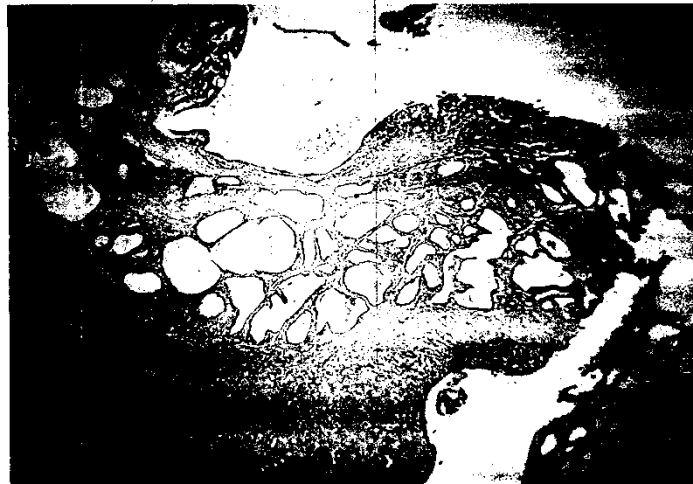


Fig. 4; Uterus- pyometra with cystic glandular hyperplasia and atrophy of glandular cells. (H&E X40).



Fig. 5; Uterus- endometrial glands and stroma within the myometrial muscle fibers: a case of uterine adenomyosis.(H&EX100)



Fig. 6; Ovarobursal adhesion: showing fibrous tag between the ovary surface and perioviductal region.

آفات الجهاز التناسلي لآناث الخراف: دراسة نسيجية امراضية مستقبلية

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الخلاصة

ركزت هذه الدراسة على الجهاز التناسلي لـ ٢١٤ نعجة . جمعت العينات بصورة عشوائية من مجزرة البصرة للفترة من كانون اول ٢٠٠٣ الى آذار ٢٠٠٤ . تهدف الدراسة الى تقييم ووصف مختلف انواع الاصابات التي تحصل في الجهاز التناسلي الانثوي للنعاج عيانا و بالفحص المجهرى. حيث تم تعزيز التشخيص العيني بالفحص النسيجي. وجدت التغييرات المرضية في ٩٨ حالة من عينات البحث. تشمل الاصابات الرحمية ٧٠% بينما امراض المبايض ٢٤% وقنات البيض ٦%. كان تشخيص الحالات المرضية في الرحم كما يلي : التهاب بطانة الرحم ٢٤,٧% ثم فرط نمو بطانة الرحم ٢,٣% و تقيح الرحم ١,٨%. اما اصابات المبيض فكانت كما يلي : اكياس المبايض ٤,٢% تلوها اكياس جنب المبيضية ٣,٢% و الالتصاقات المبيضية ٢,٨%. بينما كانت اصابات قنات البيض هي الاقل اذ بلغت ٠,٩٣%. لم يشخص في هذه الدراسة اية تشوهات خلقية او سرطانية. يمكن الاستنتاج بان الحالات المرضية المكتسبة هي اهم اسباب الآفات المرضية للجهاز التناسلي الانثوي حيث كان التهاب بطانة الرحم اكثرها تكرارا. ومن خلال النتائج المذكورة يمكن تفسير الانخفاض الحاصل في معدل الانجاب والتكاثر في النعاج في هذه المنطقة.

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