Sudan University of Science and Technology

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Study of Infertility Cases Presented in Alselate farms in East Nile at Khartoum State

دراسة حالات عدم الخصوبه الموجوده في مزارع السليت بمنطقه شرق النيل في ولاية الخرطوم

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اهدائي الأول والأخير لمعلمي هادئ البشرية أجمعين (محمد صلى الله عليه وسلم)

إلى التي قالت لي ذات ليله، وأنا في السابعة من عمري هل صليت العشاء فقلت لها كاذبا نعم ،فنظرت إلي نظره شك ،وقالت قل ما شئت ولكنه قد رآك ،فأفزعتني قد رآك هذه ،وجعلتني أنهض رغم إدعائي الكاذب ،الى التي علمتني أن اخلص كل شي لله، إلى (أمي)

إلى ذلك الرجل الوقور الذي دنا قطاف زرعه (إلى أبي العزيز جدا)

أيا :

ميما: مزجت العلم بالأخلاق يوما فأتزن

جيما: جعلت عقولنا دررا تلألأ ضوؤها

دالا: دثرت عقلا بالعلوم فأتبعت أغصانه علما وفن.

ياءا: يلوز الجهل عن امم تقيم حضاره الاخلاق قبل علومها

إلى ابي ومعلمي الدكتور مجدي...

أخص بالاهداء كل اساتذتي بالكليه...

كل يد أخذت وأعطت ،وكل عين باتت وسهرت ،،

لك عقل سعى وفكر وكل من له فضل علينا..

إلى زملائي الذين لمست منهم صدق الاخاء وحسن المعشر ..

I

Dedication

For who's said something at night when I was seventh years old, did you pray ISHAA prayer, I said laying yes! And she see to me doubt seen and said: say what did you wants but ALLAH watch you, she was scaring me (ALLAH watch you), and she made me up although of laying, for whose learn me to extricates every think to Allah, to my Mother …

For that dignified a man whose is pigging a nut from his farm´s (to my cherish able father).

Acknowledgment

Praise and unlimited thanks to ALLAH, who gave us the strength and patience to sees our respect and humble works. My first and last gift to teacher and guider for all mankind the Prophet Mohammed peace be upon him.

Letter M stand for (mixed the knowledge with faithful same day and balanced).

Letter G stands for (gets our minds spangles bright).

Letter D stand for (downloaded our minds with knowledge that guide known nest and arts).

Letter y stand for (the ill iteration escape from nations whose established sincere moral before our sciences).

To my Doctor, Teacher and father MAGDY…

I would like to extend my grateful thanks to all teachers in my college …

To all hands takes and gives, to all eyes stay wake and didn´t sleep …

To whom has vantage point in our lives …

I indebted to my friends, colleagues and neighborhood for their help and following this work. Deepest thank to those guides, support and help us, our words can´t fulfills of all their gives.

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Abstract

This study was conducted in some Alselate farms (7 farms)in East Nile area in Khartoum state in order to diagnose and determine the cases of infertility in cattle species. A total number of 20 cases were recorded in these farms from May to August 2017 . The most common causes of infertility were cystic ovarian disease 10 cases (50%) , followed by pyometra 3cases(15%) , inactive ovary 3 cases (15%) , repeated breeder disease 2 cases (10 %) , freemartinism 1case (5%) , and adhesion of the uterus 1 case (5%).The common methods used for treatment were hormonal treatment (75%), antibiotic (15%),untreated (10%).

Keywords:

Cows, fertility, infertility ,rectal examination, treatment.

مستخلص الاطروحة

أجريت هذه الدراسة في بعض مزارع مشروع السليت (7 مزارع) بمنطقه
شرق النيل في ولاية الخرطوم بغرض تشخيص ومعرفه حالات عدم الخصوبة في الفصيلة
البقريه. رصدت عدد 20 حالة في الفترة من مايو إلى أغسطس 2017. كما أوضحت النتائج أن
تكيس المبايض هو الاكثر شيوعاً (50%) وتبعه تقيح الرحم (15%) خمول المبايض(15%)،
متلازمه الرجوع للتزاوج (10%)، التخنس (5%)، التصاق الرحم (5%). وكانت طرق العلاج
المستخدمة هى العلاج الهرموني (75%) ،المضادات الحيويه (15%) والتي لم تعالج (10%).
يمكن أن نخلص من هذه الدراسة بأن اغلبيه حالات عدم الخصوبه سببها تكيس المبايضوان معظم
الحالات تم علاجها بواسطة العلاج الهرموني.

الكلمات الرئيسية :

الأبقار,الخصوبة,عدم الخصوبة,الفحص عن طريق المستقيم:العلاج

Introduction

infertility is in ability of the animal to produce living off-spring due to temporary causes (Hatem Atalla.,2014) .Also infertility defined as delayed or irregular of annual calf in cow (Noakes *et al* .,2009). The causes Infertility in farm animals is due to various causes such as nutrition, physiological disturbances and infectious causes, which may work separately or in combination (Chakurkar *et al*., 2008).

Diagnosis and Treatment of each cause must be accurately diagnosed and treated according to condition found in examination.

Recent studies showed that some metabolized and nutritional factors are responsible for infertility .The energy shortage in postpartum period led to decrease in luteinizing hormones secretions frequency and dynamic follicle diameter, however, increase calving intervals time (Chakurkar *et al.,*2008)

Objectives:-

1. To determine cases of infertility those presented in ALselate farms.

2. To diagnose and treat these cases of infertility in Alselate farms.

CHAPTER 1

LITERATURE REVIEW

1.1 Incidence of infertility:

Across sectional survey was carried out in dairy farms in the four states in Sudan to determine prevalence of reproductive health disorder that affect dairy cattle industries in country that located in Khartoum, Gezira, Sennar and White Nile States, the results indicated that 24.4 % of animals were affected with one or more reproductive health disorder. Abortion represented the major health problem affecting calf yield followed by infertility, retained placenta, metritis and repeat breeder (Elhassan *et al.*, 2015).

1.2 Cases of infertility

1.2.1 Cystic ovary:

The definition of a follicular cyst is a fluid filled structure on the ovary greater than 2.5cm in diameter (Chakurkar *et al.*,2008).

The ovarian cyst result from failure of production adequate amount of LH. Hereditary cause and increased feeding especially with ration high in protein stimulates lactations and the development of cystic ovaries.Also, adrenal hyper-function may cause cystic ovary in cattle (Hatem.,2014)

Ovarian cyst could be treated by allowing spontaneous regression, manual rupture oral administration of therapeutic drugs (Hatem.,2014).

1.2.2Pyometra:

A pyometra is uterus filled with pus that has a closed cervix and acorpus luteum on the ovary (Chakurkar *et al*., 2008).

The pus prevent the normal luteolytic mechanism for happening. This results in anestrous. The fluid in the uterus mimics a pregnancy, so the cow do not return to heat. Treatment for this condition is administration of prostaglandin to regress the corpus luteum(Chakurkar *et al*.,2008).

1.2.3Repeat breeder:

Repeat breeder refers to an infertile condition of unknown cause in which inspite of the normal estrous cycle and normal results of examination of the ovary and accessory reproductive organs. No conception occurs after three times of mating at each estrus(Yoshihiro.,2002).

The cause of the disease vary but fertilization failure and early embryonic death are considered to be the main cause .Because of a lack of definitive diagnostic criteria to infertile, cows are indiscriminately diagnosed as disease in some case .Examination preformed from different angles may reveal that some of these cases are caused by other disorders such as ovulation failure,atretic oviduct and latent endometritis. Treatment includes improving the feeding environment and breeding management which are thought to be predisposing factors (Yoshihiro.,2008).

1.2.4Freemartin:

It is a distincted for intersexuality which arises as a result of avascular anastomosis of the adjacent chorioallantoic sacs of heterozygous fetuses in multiple pregnancies (Noakes *et al*., 2009). About 92% of female's fetuses fail to have normal sexual differentiation and are likely to have anomalies of reproductive organs that lead to absolute sterility. This sterile cow is referred to as a freemartin (Yoshihiro.,2002).

The cause has not yet been clarified, however,one suggested reason is that the blood vessels of females fetal membranes are anatomized with the blood vessels of male fetal membranes in the early embryonic phase to produce an exchange of blood so that the sex-determining region Y(*sry*) deriving from the male,which masculine reproductive organ, masculinizes the ovarian primodium of the undifferentiated females fetus and induces the secretion of androgen(Yoshihiro.,2002).

Finding in clinical diagnosis include the length of the vagina being 1\3 the normal length or less,hypertrophy of the clitoris and rough and long pubic hair. Intra-vaginal examination of calves. Latest tube 2cm in diameter and 20cm long can be inserted 12-18cm into vagina in normal calves but only 8-10 into the vaginal vestibule in freemartin since they lack a vagina by rectal palpation, a hard cylinder/cone shaped object is

normally felt 5-10cm in front of the vaginal vestibule but the cervical canal, uterus and ovary are not palpable (Yoshihiro.,2002)

Detailed examination include examination of chimeras of XX/XY by chromosome test of cultured leukocytes and chimeras of blood types. By detecting Y chromosome-specific repetitive sequence by PCR(polymerase chain reaction),accurate diagnosis can be made in short period by using an extremely small amount of blood. There is no cure and conception is not possible(Yoshhiro.,2002).

1.2.5 Uterine adhesion:

A troublesome sequel to the caesarean operation is adhesion of the omentum, intestines or abdominal wall.A similar lesion may follow uterine rupture. Such lesion may accompany ovarobursal disease and may follow tardy involution of the uterus and metritis. They are frequency associated with sterility (Noakes *et al*.,2009)

1-6 Anovulation(inactive ovary):

Associated with those conditions which can predispose to true anoestrus it is in some time observed that before this occurs it is preceded by an anovulatory oestrous, with the follicle regressing and becoming atretic.Similarly, during the puerperium, before the onset of normal cyclic ovarian activity, a similar situation may arise which is comparable with that observed in seasonal polyoestrous species at the start of the breeding season. If cows are examined per rectum during the first few weeks after

calving, a number of enlarged an ovulatory follicle can often be detected; they are incorrectly described as being cysts but they are transient and do not persist even if no treatment is given(Noakes *et al*.,2009).Sometimes, however, a follicle does not regress but,having reached its maximum size of 2-2.5cm in diameter,forming luteinized follicle in the wall. This structural function is the same as acorpus luteum either regressing after 17-18 days or frequently, much earlier so that the cow returns to oestrus at a shorter than normal interval. After the demise of the luteinized follicle, the subsequent oestrus will probably be followed by anormal ovulation such structure will be < 2.5cm in diameter, fluid filled, with antrumm of luteal tissue lining the follicle and with no evidence of a point of ovulation(Noakes *et al*.,2009).

Evidence of this occurring in a living animal comes from a report by Watson and Harwood (1984).They found that in a friesian cow ovulation failed to occurs after the second oestrus 68 days after calving,as determined by twice weekly rectal palpation. Frequent sequential blood samples demonstrated abnormal LH peak, lasting about 10 hours and reaching a maximum concentration of 24 ng/ml, which was preceded by a normal pre-ovulatory oestradiol-27petapeak the day before oestrus. Thus there was apparently no extra-ovarian endocrine abnormality and the cow ovulated and conceived at the subsequent oestrus 22 days after the previous anovularty. Obviously it could have been confused with aluteal

cyst,but it was not larger than a mature follicle and did not persist.Other may also confuse it with a cystic corpus luteum which is anormal corpus luteum containing a central fluid lacuna and hence has an ovulation papilla. Cystic corpus lutea are not abnormal; they accounted for 25% of the corpora lutea examined in ovaries obtained from the abattoir. They contain the same amount of progesterone as non cystic corpora lutea(Donaldson and Hansel.,1968).Perhaps to avoid confusion, the term vacuolated corpus luteum would be preferable. These can often be identified using trans-rectal ultrasound imaging (Noakes *et al*.,2009). Diagnosis of anovulation can only be made retrospectively by noting on rectal palpation that afollicle persists longer than one would have suspected. In the case of the luteinized follicle it will remain for 17-18 days before regressing; the ovary containing it will be rounded,smooth and fluctuating rather than irregular and solid as it is with acorpus luteum. There is no information on the incidence of this conditions (Noakes *et al*.,2009).

Treatment is directed toward ensuring that ovulation occurs at the next oestrous; hence hCG or GnRH administered as described for delayed ovulation is indicated. If ovarobursal adhesions are present there is no treatment (Noakes *et al*.,2009).

CHAPTER TWO

MATERIAL and METHODS

2.1 Study Area

The study was conducted in local East of the Nile, in the period from May to August 2017. Local East of the Nile which is far from Khartoum North about 510 Km between 8-15N and longitudinal 36-25E. Its border extend from the Blue Nile to the South and to the Qari area on the Nile River border on the north side. The total area extends over approximately 5060 square kilometer (www.Khartoum.gov.sd).

The climate is not different from Omdurman or Khartoum in nature where temperatures range from (25-45 C) in the summer between April - June , and (20-30 C) between July- October . In winter is(15-20 C) between November- March . It's more convenient to divide they are into:

1. cool dry season

2. hot dry season

3. hot wet season

2.2 Animals

A total of 20 multiparous crossbred cows were used in this study in 7 farms(Table 1) in Alselate East Nile. The weight of cows range from 250-350 kg and the age range from 7-12 years old.

Table (1): Number of farms examined for infertility in East Nile – Khartoum state

No	Farms	Animals
1	Sideeg	4
2	Abd-almonem	4
3	Ahmed Mohamed	4
4	Yousif	3
5	Nahid	2
6	Ministry of finance	2
7	Al-atrak	1
	Total	20

2.3 Method of Diagnosis

2.3.1 General Examination

Temperature (36-39 C), respiratory rate (15-20) cycle /minute ,heart rate (65 -70) peat/minute and pulse rate(64-70) peat /minute were measured.

2.3.2 Detailed Examination of Genital Tract

These include rectal palpation to examine uterus for hydrometra, pyometra, endometritis and tumors. Also palpation of two ovaries to detect types of structures(cystic ovary , small ovaries and ovarian tumors). Rectal examination of cows is a very time-honored technique for the diagnosis of pregnancy. The proximity of the reproductive tract of the cow to the rectum and its elasticity allows a trained operator to detect characteristics of the tract that coincide with either pregnancy or nonpregnancy(Whittier.,2013). The procedure was done by using long a plastic sleeve by introduce the hand through the rectum, and the first step was empting the rectum from the faces and then examined the tract start with the cervix until reach to the ovaries(Fig 1).

2.4 Bacteriology

The media used for culturing the swab(20 swabs) were blood and nutrient agars to detect the cause of bacterial agents in metritis and pyometra (Fig 2, 3).

Figure1: Rectal examination technique (whittier,2103)

RESULTS

A total number of 20 cases of infertility were presented in different farms in Alselate in East Nile-Khartoum state during period from May to August 2017. Four cases (20%) were recorded in Sideeg farm , Abd-almonem farm and Ahmed Mohamed farm followed by Yousif farm (3 cases,15%), Nahid and Ministry of finance farm (2 cases,10%). Only one case was found in Al-atrak farm (5%)(Table.2).

The most causes of infertility (Table 3) were cystic ovarian disease (10 cases 50%) ,followed by pyometra (3cases 15%) , inactive ovary (3 cases 15%) , repeated breeder disease (2 cases 10 %) , free-martinism (1case 5%) , and adhesion of the uterus (1 case 5%).

The methods of treatment for cases of infertility were used shown as in table 4. In all farms, the hormones was commonest treatment (15 cases, %) followed by antibiotic (3 cases 15%). There were two cases does no treated (10%).

Microscopic examination of the growth of bacteria in blood and nutrient agars (fig 4, 5) showed that different type of gram positive and negative bacteria.

Table (2): Cases of infertility presented during period from May to August 2017 in Alselate farms East Nile-Khartoum state

Farms	Number of cases
Sideeg	4(20%)
Abd-almonem	4(20%)
Ahmed Mohamed	4(20%)
Yousif	3(15%)
Nahid	2(10%)
Ministry of finance	2(10%)
Al-atrak	1(5%)
Total	20(100%)

Table (3): Causes of infertility recorded in Alselate farms in East Nile at Khartoum state(5/5/2017 to15/8/2017).

Farms	Cystic ovary	pyometra	Inactive ovary	Repeat breeder	Free-martin	adhesion of uterus	total
Sideeg	2(10%)	0	0	2(10%)	0	0	4(20%)
A.A	4(20%)	0	0	0	0	0	4(20%)
A.M	1(5%)	1(5%)	1(5%)	0	0	1(5%)	4(20%)
Yousif	1(5%)	0	2(10%)	0	0	0	3(15%)
Nahid	2(10%)	0	0	0	0	0	2(10%)
M.O.F	0	1(5%)	0	0	1	0	2(10%)
Al-atrak	0	1(5%)	0	0	0	0	1(5%)
Total	10	3	3	2	1	1	**20(100%)**

Table (4): Methods of treatment of infertility recorded in Alselate farms in East Nile at Khartoum state

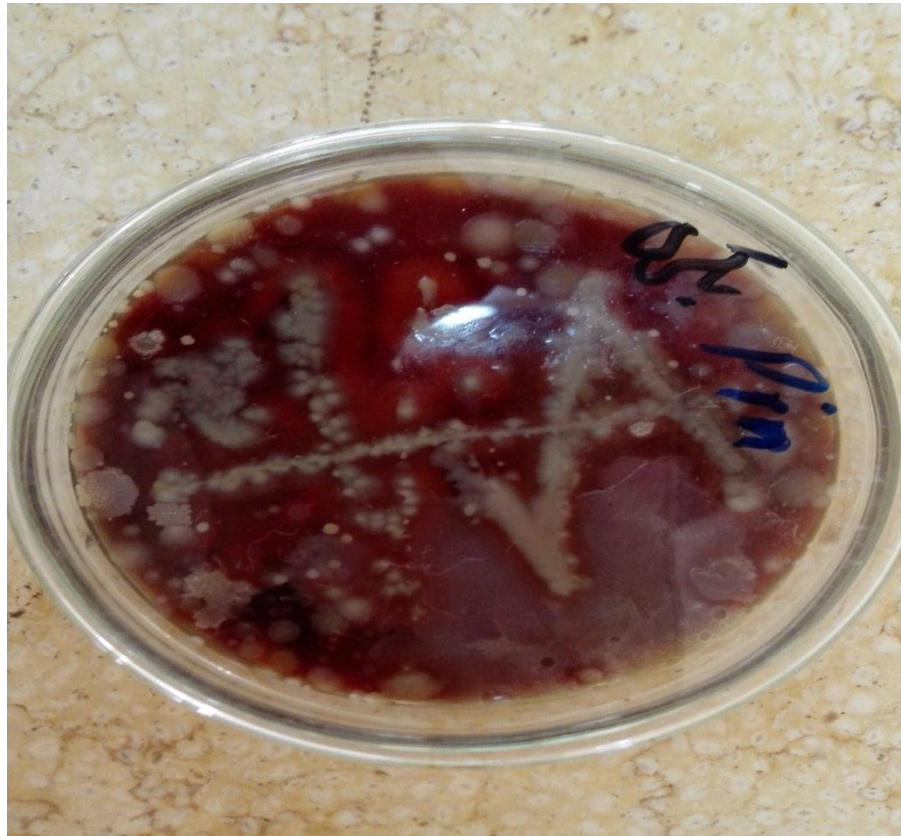| Farms	Hormonal	Antibiotic	Untreated	Total
Sideeg	4	0	0	4
Abd-almonem	4	0	0	4
A.M	2	1	1	4
Yousif	3	0	0	3
Nahid	2	0	0	2
M.O.F	0	1	1	2
Al-atrak	0	1	0	1
Total	15(75%)	3(15%)	2(10%)	20(100%)

Figure 2:Bacterial culture in blood agar from cows(n=20)suspected metritis and pyometra in East Nile-Khartoum state.

Figure 3:Bacterial culture in Nutrient agar from cows(n=20)suspected metritis and pyometra in East Nile-khartoum state.
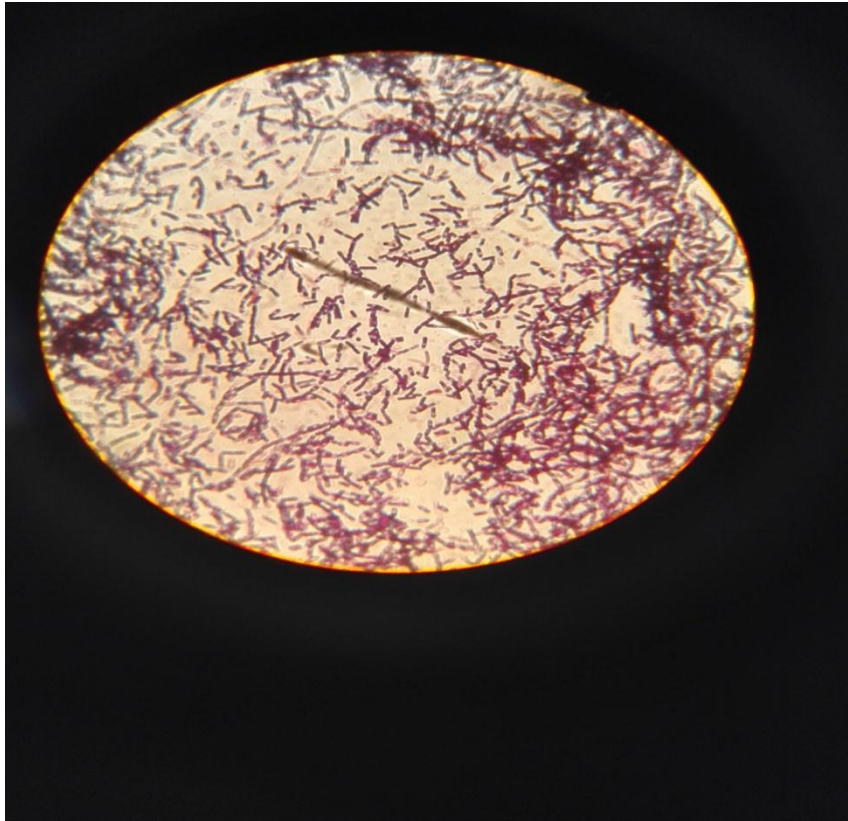
Figure4: Microscopic examination of bacteriagrowth in blood agar from cows(n=20)in East Nile-Khartoum state.
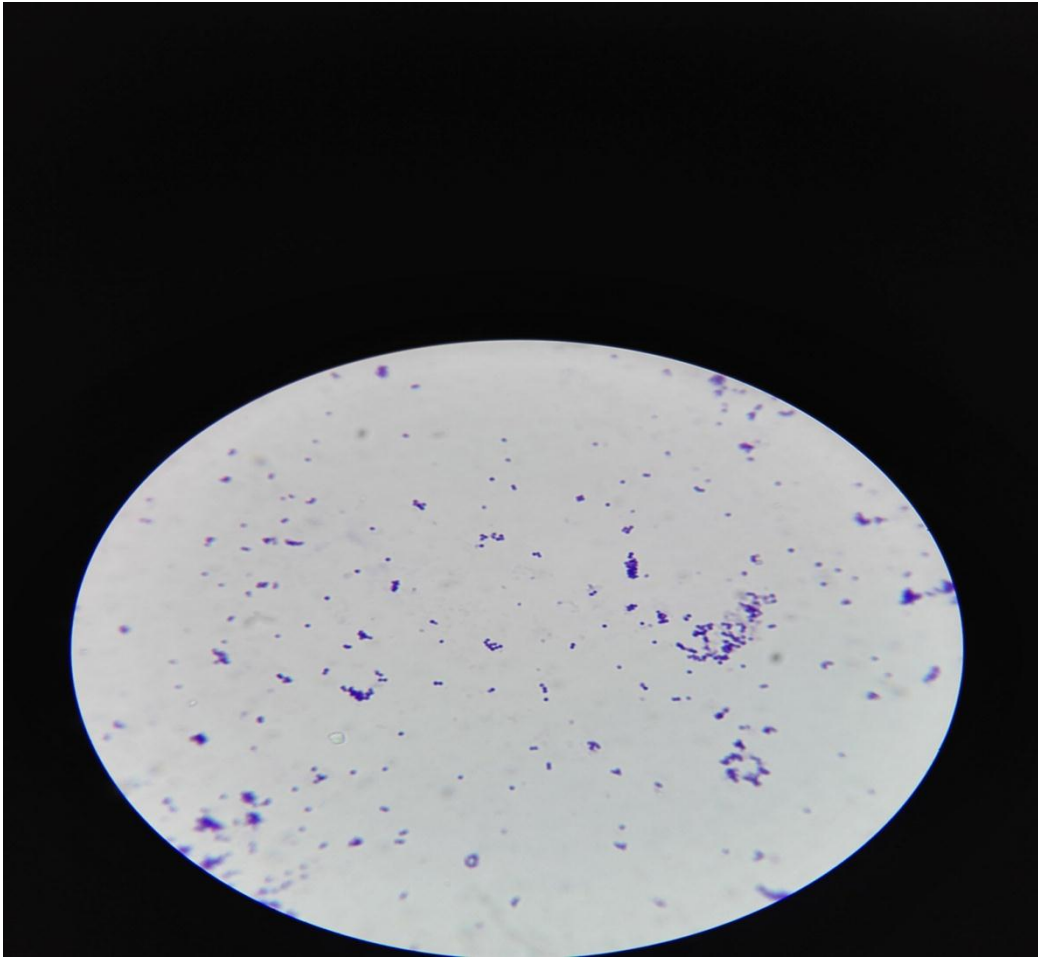
Figure5: Microscopic examination of bacteria growth in nutrient agar from cows(n=20)in East Nile-Khartoum state.

CHAPTER 4

DISCUSSION

The study was conducted in Alselate farms in the local East of the Nile at Khartoum state. Many cases of infertility in cattle were recorded from May to August 2017. In the present study, the largest number of cases diagnosed as cystic ovary (50%).Similarly,Watson and cliff (1997) who recorded the large number of infertility cases were cystic ovary (62-85%)..The results also demonstrated that pyometra was a second common cause of infertility (15%). This finding is in agreement with Abusara and Abdelgadir (2014) who reported that metritis (21.7%) was common cause of infertility in cases that presented in veterinary hospitals at Khartoum state. In the present study, few cases of repeat breeder(10%),freemartitnism (5%) and adhesion of the uterus (5%) were reported as causes of infertility. These finding is similar to that observed by Noakes *et al*, (2009).

In this study, hormones and antibiotic were used for treatment of cystic ovary and pyometra, These findings are consistent with previous study of Hatem (2014) who recorded that cases were treated by hormonal methods.

CONCLUSION AND RECOMMENDATIONS

It could be concluded that:

The infertility represents an economic problem for the owners and producers. Cystic ovary is the most common cause of infertility in the cows in Alselate farms in local East Nile. There is no cases of retained placenta, hermaphroditism, abortion, endometritis, tumor, hydrometra and uterine prolapsed were reported in Alselate farms during period of study.The hormones were commonly used for treatment of infertility cases.

It is recommended that:

i. The farmers should be selected high fertility animals to establish farm.

ii. Further studies will be conducted about genetic improvement for control of diseases that causes infertility in cow.

iii. The farmers should be treated the cases of infertility in the early stages to avoid progress the diseases.

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