Research Article

ISOLATION OF SOME PATHOGENS OF FEMALE REPRODUCTIVE TRACT INFECTIONS WITH ANTIBIOTIC SENSITIVITY TEST IN GOATS

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Abstract: The study was designed to diagnose some causes of reproductive tract infections in goats with an antibiotic sensitivity test. Twenty-eight goats suffering from various infections of the genital tract. The results showed show the common causative agents of genital tract infection are gram-negative coccus, coccobacilli, and E. coli. The antibiotic sensitivity test shows a drug that was affected was Enrofloxacin 10% (+++), and Doxycycline 30% (++). The results were shows that the response to treatment for cases in the fourth group (Enrofloxacin injection + sulfa-trimethoprim lotion) was the highest, and this was shown in the success of fertilization and pregnancy for 6/7 cases (85.7%) comparative with (33.3%) to the 3rd group (Gentamicin injection + vaginal lotion of potassium permanganate solution), (50%) to the 1st group (Oxytetracycline injection + iodine lotion), and 2nd group (Penicillin-streptomycin injection + vaginal lotion of iodine solution). The study concluded the isolated bacteria found proved to be highly resistant to Oxy-tetracycline, Penicillin-streptomycin, and Gentamycin while using Enrofloxacin 10% was very effective on these microorganisms. The high percentage of resistance found in this study highlights the importance of the responsible use of antibiotics in extensive goat production. The early verdict of various pathological affections of female reproductive organs will help veterinarians for proper diagnosis and treatment of diseases and approve suitable preventive and control dealings for optimum fertility, reproduction, and production in goat farming.

Keywords: Isolation, pathogens, reproductive tract, Antibiotic sensitivity, goats


1. Introduction

The bacteria and viruses that live in the animal epithelia create an ecosystem called residents, inhabitants, or transients (Pascale et al., 2018). Types of bacteria are the most prevalent creatures in this environment. These bacteria typically coexist with their hosts in an associational state. Inequality in the environment and the immune system can also hurt the health of the hosts, and some bacteria have the potential to develop into pathogens (Belkaid et al., 2013). It has been discovered that the vaginal bacteria in ruminants vary depending on breed, estrous cycle, and physiological and reproductive states (Giannattasio et al., 2019).

Due to the employment of reproductive technology (progestogens, prostaglandins, and gonadotropins), particularly in extensive livestock, the investigation of the vaginal microbe in small ruminants has become more important recently (Manes et al., 2018). Goat vaginal bacteria’ makeup is only partially understood. According to reports, Gram-positive bacteria make up the majority of it, with Gram-negative bacteria making up the remainder (Manes et al., 2013). Infertility and vaginitis in goats have been linked to a change in the

composition of vaginal bacteria brought on by the use of vaginal devices containing progestogens (Penna et al., 2013).

Although goats are simple creatures who can adapt to a variety of environmental situations, production goats frequently experience fertility and conception issues (Salinas et al., 2016). The opportunistic bacterial population, which may cause clinical and subclinical vaginitis, can be identified by studying the vaginal microbes of Creole goats. This information can serve as the foundation for estimating the extent to which reproductive system illnesses in goats are responsible for production issues. Also, understanding the VM bacteria’s chemotherapeutic susceptibility profile aids in optimizing the management of these infections (Manes et al., 2018).

2. MATERIALS AND METHODS

Animals

Twenty-eight goats suffering from various infections of the reproductive tract (vaginitis, cervicitis, and metritis) serve as study groups. The study was conducted in Al-Muthanna province (2023). Clinical symptoms included increased rectal temperature (40-42 c°), lack or loss of appetite, vaginal secretions with a color between milky white and grey-red, and some animals that have failed to fertilize and repeat breeders. Samples of genital secretions were collected and sent to the laboratory to diagnose the causative agent and conduct antibiotic sensitivity tests. The animals were treated with various types of antibiotics, and divided into four groups:

- Group 1: Oxytetracycline injection + iodine lotion (n=7)
- Group 2: Penicillin-streptomycin injection + vaginal lotion of iodine solution (n=7).
- Group 3: Gentamicin injection + vaginal lotion of potassium permanganate solution (n=7)
- Group 4: Enrofloxacin injection + sulfa-trimethoprim lotion (n=7)

Collection the Samples

A sample of genital secretion was collected by inserting a sterile swab in the vagina, gently rubbing on the walls of the vaginal mucosa to future be located in a sterile transport medium (Amies transport medium with charcoal). The swabs were kept refrigerated till examination (<12 hours). All the bacteriological processing of the samples was carried out in the Al-Noor Diagnostic Laboratory in Basra City. For the isolation and identification of the microorganisms, the swabs were sown on broth media (USA). The samples were incubated under aerobic conditions, 37° C for 24 to 48 hours. The different isolates were identified both macroscopically (colonial morphology and microscopically (Gram stain) (Barrow and Feltman, 2004).

Laboratory examinations

The samples of genital secretion are stained by using the gram stain and then a broth bacterial culture to conduct the type of bacteria. An antibiotic sensitivity test was performed to choose the affected drug used for treatment.

3. RESULTS

Gram stain examination shows gram-negative cocci and coccobacilli, and the broth bacterial culture shows E. coli, (Figure 1). The antibiotic sensitivity test shows a drug that was affected by these infections is Enrofloxacin 10% (+++), and Doxycycline 30% (++), (table 1), (Figure 2).

<table>
<thead>
<tr>
<th>Type of Examination</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gram Stain</td>
</tr>
<tr>
<td>2</td>
<td>Broth bacterial culture</td>
</tr>
<tr>
<td>3</td>
<td>Antibiotic sensitivity test</td>
</tr>
<tr>
<td></td>
<td>Gram-negative cocci and coccobacilli</td>
</tr>
<tr>
<td></td>
<td>E. coli</td>
</tr>
<tr>
<td></td>
<td>Enrofloxacin 10% (+++)</td>
</tr>
<tr>
<td></td>
<td>Doxycycline 30% (+++)</td>
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</tbody>
</table>
The animals were treated, and the results were shows that the response to treatment for cases in the fourth group (using Enrofloxacin injection + sulfa-trimethoprim lotion) was the highest, and this was shown in the success of fertilization and pregnancy for 6/7 cases (85.7%) comparative with (33.3%) to the 3rd group (Gentamicin injection + vaginal lotion of potassium permanganate solution), (50%) to the 1st group (Oxytetracycline injection + iodine lotion), and 2nd group (Penicillin-streptomycin injection + vaginal lotion of iodine solution) (Table 2).

Table 2. Response to treatment and fertilization success rate with different treatment programs

<table>
<thead>
<tr>
<th>Study group</th>
<th>Systemic Antibiotic</th>
<th>Dose and administration route</th>
<th>Vaginal lotion</th>
<th>Healing percent</th>
<th>Fertilization rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st (n=7)</td>
<td>Oxytetracycline 30%</td>
<td>1ml/30 kg (I/M)</td>
<td>Tincture iodine</td>
<td>2/7 (28.5%)</td>
<td>1/2 (50%)</td>
</tr>
<tr>
<td>2nd (n=7)</td>
<td>Penicillin-streptomycin</td>
<td>1ml/20 kg (I/M)</td>
<td>Tincture iodine</td>
<td>2/7 (28.5%)</td>
<td>1/2 (50%)</td>
</tr>
<tr>
<td>3rd (n=7)</td>
<td>Gentamycin 10%</td>
<td>1ml/10 kg (I/M)</td>
<td>Potassium permanganate</td>
<td>3/3 (50%)</td>
<td>1/3 (33.3%)</td>
</tr>
<tr>
<td>4th (n=7)</td>
<td>Enrofloxacin 10%</td>
<td>2ml/10 kg (I/M)</td>
<td>Sulfatrimethoprim</td>
<td>7/7 (100%)</td>
<td>6/7 (85.7%)</td>
</tr>
</tbody>
</table>

Figure 1. Gram-negative cocci and coccobacilli at the Gram Stain
4. DISCUSSION

According to the results of this study; such prolificacy often fails to be attained on account of pathological problems related to the genital tract in female goats. Genital abnormalities play an important role in animal breeding either by causing infertility or sterility agree with (Azzawi et.al., 2011), which also show that female goats suffer from genital pathologies predominated by diseases of the uterus followed by ovary, cervix, fallopian tubes, and vagina. The inflammatory lesions and signs in the genitalia generally occur together, and in most of the cases, cervicitis and vaginitis were seen in association with endometritis in the present study agree with (Hatipoglu et al., 2002).

It may be concluded from the study that out of most cases of goats affected with pathological conditions of the genital tract. The most affected organ was the uterus with endometritis being the major condition, followed by the ovary and cervix. As the pathological lesions in the genital tract result in sub-fertility, infertility, and sterility among female goats, regular monitoring and sampling for disease diagnosis will help in proper treatment (selection of the drug of choice) of the conditions as well as for adopting suitable preventive and control measures for better reproduction and production agree with (Beena et al., 2015).

During the study and after isolating some of the factors that cause diseases of the reproductive system, it was observed that the animals responded to treatment using Enrofloxacin (100%), and this appeared clearly through the high rate of fertilization and pregnancy rates, and this is consistent with the (Harrenstien et al., 2000) that was show the Enrofloxacin remains an important antibiotic for treating bacterial infections, and veterinarians using this drug should reserve it for cases when a powerful bactericidal compound is required.

5. CONCLUSIONS

The reproductive tract infections were caused by many microorganisms that cause different genital inflammations in goats and are composed mainly of gram-negative cocci and coccobacilli bacteria and to a lesser extent by gram-negative bacteria (Escherichia coli). The isolated bacteria found proved to be highly resistant to Oxy-tetracycline, Penicillin-streptomycin, and Gentamycin while using Enrofloxacin 10% was very effective on these microorganisms (confirmed in this study by the antibiotic sensitivity test). The high percentage of resistance found in this study highlights the importance of the responsible use of antibiotics in extensive goat production. The early verdict of various pathological affections of female reproductive organs will help veterinarians for proper diagnosis and treatment of diseases and approve suitable preventive and control dealings for optimum fertility, reproduction, and production in goat farming.

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References


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