Investigation into gyneco-pathological disorders and identification of associated bacteria from the genital organs of cows in Dinajpur, Bangladesh

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ABSTRACT

The present study was aimed to investigate the gynaeco-pathological disorders by post-mortem and histopathological examination, and to identify the associated bacteria. A total of 310 genital tracts of cows were collected from slaughter house of Dinajpur Sadar Upazilla during April 2009 to March 2010. Among the 310 samples, 31.29% (n=97/310) were affected with endometritis. Similarly, 8.37% (n=26/310) cystic ovary, 6.77% (n=21/310) ovary hyperplasia, 4.84% (n=15/310) pyometra, 4.84% (n=15/310) parovarian cyst, 4.52% (n=14/310) hydrometra, 4.84% (n=15/310) ovary hypoplasia, 3.55% (n=11/310) ovaro-bursal adhesion, 1.29% (n=4/310) vaginal cyst and 0.66% (n=2/310) hemorrhagic uterine horn were detected by post-mortem examination, the cases were reconfirmed by histopathological studies. Uterine fluid (n=50) samples were collected, and were subjected for conventional bacteriological culture and biochemical analysis. *Escherichia coli* and *Salmonella* sp. could be identified from 30% (n=15/50) and 8% (n=4/50) samples, respectively. In conclusion, various pathological disorders in the female reproductive system of cows are prevalent, that may cause reduction of calf production.

Keywords

Bacteria, cows, genital organs, histopathology, identification, post-mortem

INTRODUCTION

Livestock is an integral part of agriculture, and cattle provides important source of animal protein. Nowadays, most of the people in Bangladesh rears crossbred (local breed x foreign breed) cows for both milk and meat purposes. Sometimes the cross breed, local breed and foreign breed cows become infertile due to defective breeding program, inadequate knowledge of rearing system, and faulty ration formulation. Inadequate nutrition is the major cause of ovarian atrophy and subsequent anestrus and bacterial infection. According to Hossain et al. (1986) and Farooq (2000), gyneco-pathological disorders and found mostly in cross breed animals as compared to local cows. Infertility disorder in cows of Bangladesh is commonly seen because of poor nourishment, and using of low quality semen.

Following calving, the uterus of cow may become infected due to presence of infectious or non-specific microorganisms. Several bacterial, protozoan, viral and mycoplasmal infections are common in postpartum period. The most common and economically important bacteria for uterine infection are *Actinomyces* spp., *Escherichia coli*, *Fusobacterium* spp., *Pasteurella* spp.,
Clinical endometritis is associated with delayed uterine involution and poor fertility. Bacterial pathogens are the potential cause when cows fail to conceive on one or more cycles in the same season. Nibret et al. (2013) isolated and identified S. pyogenes, E. coli and Streptococcus spp. as most frequently associated bacteria for fertility problem. Sulake et al. (2013) isolated and identified microflora species at different parts of the female genital tract (cervix, body of uterus, horns of uterus and oviducts) of ewes and indicated that there were different types of bacteria distributed throughout genital system as E. coli (37.83%), Salmonella (21.62%), Klebsiella (10.81%), Staphlococcus aureus (6.75%), Streptococcus spp. (6.75%), Proteus (6.75%), Micrococcus (5.4%) and finally others such as S. epidermidis and Pseudomonas spp. (4.05%). Rahman et al. (1993) carried out a study on the incidence of reproductive disorders with 2280 cows and heifers in six Artificial Insemination (AI) pocket areas namely Hazirhat (Rangpur), Puthia (Rajshahi), Avoyngar (Jessore), Comilla, Manikganj and Moshurikholo (savar) during the period from July 1990 to June 1991. However, to the best of our knowledge, there is no report on the study of reproductive health problem in Dinajpur area of Bangladesh. Therefore, the present study was designed to investigate the gynecopathological disorders of cows and identification of the associated bacteria with genital organs of cows in Dinajpur, Bangladesh.

**RESULTS AND DISCUSSION**

Detailed post-mortem examination was performed on 310 freshly collected female genitalia of cows. On post-mortem examination, 31.29% (n=97/310) cases were detected as endometritis followed by 8.37% (n=26/310) cystic ovaries, 6.77% (n=21/310) ovarian hyperplasia, 4.84% (n=15/310) pyometra, 4.84% (n=15/310) parovarian cyst, 4.52% (n=14/310) hydrometra, 4.84% (n=15/310) ovarian hypoplasia, 3.55% (n=11/310) ovarian hypotrophic cysts, 1.29% (n=4/310) vaginal cyst, and 0.65% (n=2/310) hemorrhage in ovary (Table 1 and 2); these findings were in agreement with the findings of Alam and Rahman (1979) who reported that 90% animals showed abnormalities in Dhaka slaughter house in which the most common abnormalities were recorded as ovarian cysts and pyometra. On the other hand, Shamsuddin et al. (1988) and Mollah et al. (1989) reported that about 8 to 27% cows suffered from endometritis among the principal causes of reproductive failure in cows. Borsberry and Dobson (1989) recorded 14.80% incidence of endometritis alone or in combination with other periparturient disorders, which were lower than the present study. This variation might be due to improved health management and nutritional status of the animals. Other gross abnormalities detected in uterus...
Table 1: Pathological disorders encountered at post-mortem examination of Uterus of cows.

<table>
<thead>
<tr>
<th>No. of uterus observation</th>
<th>Endometritis</th>
<th>Pyometra</th>
<th>Hydrometra</th>
<th>Vaginal cyst</th>
<th>Hemorrhage in uterine horn</th>
</tr>
</thead>
<tbody>
<tr>
<td>310</td>
<td>97</td>
<td>15</td>
<td>14</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>(%)</td>
<td>31.29</td>
<td>4.84</td>
<td>4.52</td>
<td>1.29</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Table 2: Pathological disorders encountered at post-mortem examination of ovary of cows

<table>
<thead>
<tr>
<th>No. of ovary</th>
<th>Ovarian cyst</th>
<th>Parovarian cyst</th>
<th>Ovarian hyperplasia</th>
<th>Ovarian hypoplasia</th>
<th>Ovarobursal adhesion</th>
<th>Hemorrhage in ovary</th>
</tr>
</thead>
<tbody>
<tr>
<td>310</td>
<td>26</td>
<td>15</td>
<td>21</td>
<td>15</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>(%)</td>
<td>8.37</td>
<td>4.84</td>
<td>6.77</td>
<td>4.84</td>
<td>3.55</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Figure 1: (A) Pyometra. (B) Hydrometra (D) Parovarian Cyst in ovary (E) Hemorrhage in uterine horn (F) Hyperplastic ovary.

Figure 2: (A) A case of pyometra exhibiting presence of huge reactive cell infiltration (H&E x10). (B) A case of chronic endometritis exhibiting infiltration of inflammatory cells and moderate fibrosis (H&E x10). (C) Hyperplastic ovary characterized proliferation of fibrous tissue (H&E x10). (D) Higher magnification of hypoplastic ovary (H&E x10).

Table 3: Isolation and identification microorganism from female genital tracts (n=50) of cattle.

<table>
<thead>
<tr>
<th>Organisms</th>
<th>No. of affected uterus</th>
<th>% of infection</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Escherichia coli</em></td>
<td>15/50</td>
<td>30</td>
</tr>
<tr>
<td><em>Salmonella spp.</em></td>
<td>4/50</td>
<td>8</td>
</tr>
</tbody>
</table>

were pyometra (4.84%; n=15/310), hydrometra (4.52%; n=14/310), vaginal cyst (1.29%; n=4/310), and hemorrhage in uterine horn (0.65%; n=2/310) and in ovary, ovarian cyst (8.37%; n=26/310), parovarian cyst (4.84%; n=15/310), ovarian hyperplasia (6.77%; n=21/310) ovarian hypoplasia (4.84%; n=15/310), ovariobursal adhesions (3.55%; n=11/310) and hemorrhage in ovary (0.65%; n=2/310) (Figure 1). The results obtained in our study were likewise higher as compared to those of formerly documented data repert by Chaudhari et al. (2000), in which the gross abnormalities of the genitalia included ovarian cyst (3.35%), parovarian cyst (0.26%), ovarian hypoplasia...
Table 4: Cultural and biochemical characteristics of isolated organisms

<table>
<thead>
<tr>
<th>EMB agar</th>
<th>SS agar</th>
<th>Staining character</th>
<th>MIU</th>
<th>TSI</th>
<th>Organism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green metallic sheen</td>
<td>No</td>
<td>Gram negative</td>
<td>+</td>
<td>+</td>
<td>E. coli</td>
</tr>
</tbody>
</table>


(2.2%), ovarobursal adhesion (2.9%), and endometrocervicitis (1.7%), pyometra (0.48%), hypoplastic uterus (0.24%) and uterine cyst (0.08%). However, Ali et al. (2006) found the similar abnormalities in the reproductive tracts of descriptive cows.

In this study, massive infiltration of lymphocytes, macrophages, monocytes and plasma cells in the endometrial mucosa, stroma and uterine glands was found (Figure 2). On the other hand, massive infiltration of neutrophils was found in the cases of pyometra which was supported by Rahman et al. (2002), Farooq (2000) and Manda et al. (2007). According to Kotowski (2001), the pathological changes more commonly found in the uterus as compared to those of ovaries.

The microbiological examination performed on 50 freshly female genitalia collected from slaughter house revealed that 30% (n=15/50) of genital organs were affected with E. coli, and 8% (n=4/50) were affected with Salmonella spp. (Table 3 and 4). These findings were in support of the findings of Nibret et al. (2013), Sulake et al. (2013) and Erin et al. (2005).

CONCLUSION

Various pathological disorders in the female reproductive system may affect the reproduction performance. Further, it may be pointed out that various pathological disorders in female reproductive system are increasing menacingly along with introduction of cross breeding program through artificial insemination. The problem may be aggravated due to inadequate veterinary coverage and gynecological knowledge, which needs more attention.

REFERENCES


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