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PREVALENCE OF ENDOMETRITIS IN DAIRY COWS IN EASTERN ALGERIA

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ABSTRACT

This epidemiological study was carried out by distribution of questionnaire among veterinary practitioners managing some dairy farms in Eastern Algeria. The frequency of endometritis according to other pathological entities, the epidemiological analysis according to the race, the season and the rank of the calving, the complications, the therapeutic protocols applied by the veterinarians as well as the prophylactic measures were the object of our study. The results of the survey showed that the per centage of endometritis in relation to other health problems is between 10 and 15 per cent. According to the degree of intensity of the symptoms, it was noted that the first degree endometritis represented 29.54 per cent of the cases surveyed while the second and the third degree endometritis represented 27.87 per cent and 20.45 per cent respectively. Most of the clinical cases were treated with prostaglandin F2α, with a frequency of 72.72 per cent, while 22.72 per cent of the cases did not undergo any hormonal treatment. The systematization of the epidemiological study of endometritis in cows should guide the therapeutic approach to better control infertility in intensive dairy farms.

Keywords: Survey, Endometritis, Dairy Cow, Algeria, Treatment.

INTRODUCTION

Endometritis significantly affects fertility and milk production, which reduces the profitability of dairy cattle. The study of the risk factors that cause endometritis has become essential in order to control and command the production performance in dairy cattle (Adnane, 2017). The data collected at the level of the Ministry of Agriculture and Rural Development in 2015; depicted the positive evolution in quantities of raw milk produced, at an evolution rate of 36 per cent. In addition; it was noted that the problems of sterility were due mainly to endometritis and it

dramatically affected the performance of reproduction and milk production of the cow in Algeria. Endometritis is an inflammation of the endometrium, the lining of the uterus. It is usually diagnosed in cows that are more than 21 days into their lactation (Boisclair and Dubuc, 2011), that occurs in response to bacterial aggression, caused by occasional, non-specific invading germs such as *Corynebacterium pyogenes, Escherichia coli* and *Fusobacterium necrophorum* (Ball and Peters, 2004).

MATERIALS AND METHODS

In the present study a descriptive statistical analysis was carried out on the basis of data collected from practicing veterinarians (Annexure 1) from six wilayas of the country, located in the East of Algeria; which is known as "dairy herd areas". The aim was to carry out an analytical approach on the context of evolution of endometritis in dairy cows; and highlight the constraints that deter the development of the "milk" sector in Algeria. The data collected were analysed statistically using software Microsoft Excel 2020. The following parameters were analysed; the importance of endometritis in different species (cattle, sheep, goats and equine), the frequency of uterine infections in relation to the pathological entities, the epidemiological presentation according to the breed, season and rank of calving, the complications, the therapeutic protocols applied by the veterinarians.

RESULTS AND DISCUSSION

Frequency of endometritis in species

The survey was carried out among 550 cows distributed in 44 livestock farms located in six wilayas of East of Algeria (Constantine, Jijel, Oum bouaghi, Batna, Mila and Skikda). The list of farmers were provided by the local veterinarians. The number of cows per farm in the present study ranged from three for small farms to 120 cows for large farms.

According to the results obtained through the questionnaire distributed to 44 practicing veterinarians, 81.39 per cent of veterinarians (36 of 44 veterinarians) reported that the bovine species were the most affected by endometritis in areas where the bovine livestock was the most widespread (Constantine, Jijel, Mila and Skikda). 16.6 per cent of veterinarians (7 of 44 veterinarians) reported that the sheep species was the most affected in zones where the number of the sheep species was more (Oum Bouaghi and Batna). Goats and horses were less affected because of their limited numbers compared to sheep and cattle according to the statistics. Sagartz and Hardenbrook (1971) found that 77 per cent of infertile cows showed signs of endometritis on histopathological

examination, confirming the over-frequency of this disease entity in bovine.

Frequency of endometritis compared to other infections

According to the results of clinical diagnosis based on vaginoscopy and registered on data bases of farms owners; 41.86 per cent of veterinarians (18 of 44 veterinarians) reported that the frequency of endometritis is 10 to 15 per cent compared to other infections, while 37.21 per cent of veterinarians (16 of 41 veterinarians) estimated that this frequency does not exceed 10 per cent, however 13.95 per cent (06 of 44 veterinarians) and 6.98 per cent of veterinarians (4 of 41 veterinarians) estimated it successively between 15 to 30 per cent and 30 to 40 per cent. Stevenson and Call (1988) conducted a review of eight (08) surveys in the USA; and revealed that genital infections alone reach an average of 36.9 per cent of dairy cows with a range of 19.9 to 81.6 per cent. According to these authors, genital infections compete in the USA with mastitis, metabolic diseases and foot diseases.

Influence of the breed

90.70 per cent of veterinarians reported that the breeds with high milk yield were the most affected by endometritis but 9.30 per cent of them reported that the meat cattle were the most affected. It was reported that the condition of giant fetus caused dystocia and consequently endometritis. According to Eldesuqi (2006), excess energy at dry-off leads to excessive fattening at calving (fat cow syndrome) which might cause the lack of uterine muscle tone, delayed parturition and placenta expulsion, leading to infection. An unbalanced diet lacking in selenium, vitamin A and E, trace elements and minerals increased the incidence of endometritis (Meyer, 2009). Vitamin A deficiency blocked ovarian cycles, lead to discrete heats, embryonic mortality, abortions, and the birth of stunted or stillborn calves. According to Hanzen *et al.* (1996), the frequency of uterine infections which was 29 and 36.5 per cent respectively consisted of 4856 dairy and 6084 meat type cows in Belgium. According to Hanzen (2008) the frequency of endometritis according to speculation and types of chronic endometritis during post partum (d21 to d50) in dairy cows was as follows: 24 per cent for 1st degree metritis, 43 per cent, for the 2nd degree, and 33 per cent for the 3rd degree metritis.

Influence of the season

Since calving existed during the whole year, the season factor was taken into consideration by the majority of veterinarians. The frequency of endometritis was high in winter (46.51 per cent), moderately high in spring (27.90

per cent), 16.27 per cent in summer and less acceptable in autumn (9.30 per cent). According to Paccard (1981) the autumn and winter calvings were generally followed by poor fertility, in contrast to those of spring where there was an improvement in fertility due to the photoperiod. Cows that were fed with low digestible nutrients or those that received poor hay showed lower fertilization rate at first calving than that of cows that were overfed (Craplet, 1952).

Influence of the number of calving on endometritis

The veterinarians systematically performed a vaginal examination after each calving, complemented by a rectal ultrasound examination to detect the presence or absence of endometritis. The rate of endometritis was found to be 62.5 per cent after the first calving, 15 per cent after the third calving, 12.50 per cent after fourth calving and 5 per cent after second and fifth calving. This incidence of increased appearance at first calving, could be explained by the fact that the heifers were serviced too young and had an insufficiently developed pelvis, which lead to dystocia. According to Craplet (1952), the genital organs were small, atrophied and the ovaries showed a reduced activity, due to which parturition was difficult and tears were frequent during first calving.

Influence of postpartum problems on the occurrence of endometritis

The retention of foetal membranes was the most frequent post partum problem that preceded endometritis with a rate of 81.81 per cent; while 18.18 per cent of endometritis was due to dystocia. According to Jegou *et al*. (2005), the risk of placental retention increased if the cow had the feeding pattern of forage such as "corn silage then pasture" or "grass silage: then mixed pasture/corn rations" or by a ration deficient in selenium and vitamin E. According to Doulaïmi (2003), this risk also increased if the cow has had an abortion, twins and retained placenta the previous year.

Complications

In the present study, 81.81 per cent of veterinarians reported that the complications observed in endometritis were infertility and infecundity, 18.18 per cent of them found that septicaemia represented a major complication. According to the degree of intensity of the symptoms, it was noted that the first degree endometritis represented 29.54 per cent of the cases surveyed while the second and the third degree endometritis represented 27.87 per cent and 20.45 per cent respectively. Bruyas *et al.* (1993a,b) also reported endometritis as the major etiological factor responsible for the "Repeat-Breeding".

Therapeutic protocols used for endometritis

According to the data obtained, the therapeutic protocols used by the most of veterinarians were as follows:

Protocol 1: Tetracycline added to corticoids (56 per cent);

Protocol 2: Tetracycline added to non-steroidal anti-inflammatory (22 per cent);

Protocol 3: Betalactamines added to corticoids or peni-streptomycin and non-steroidal anti-inflammatory drugs (19 per cent);

Protocol 4: sulfonamides added to corticoids (3 per cent).

The therapeutic uses of tetracyclines in the treatment of bacterial mammary and genital affection were because of their broad spectrum activity, their excellent distribution and tumor fixation (Fantaine, 1992).

Hormone therapy used in endometritis

Present survey revealed that most clinicians used estrumate (72.72 per cent), 22.72 per cent did not use any hormonal treatment and 4.54 per cent treated the animals with estrogens. Mazouz and Nass (1999) reported that in Morocco two groups of hormones were used: Prostaglandin F2α (Estrumate)ND, (Prosolvin)ND, (Prostavet)ND and estrogens (Estradiol benzoate). Prostaglandin F2α and estrogens were favorable to the rapid elimination of infection during uterine involution (Airieau, 2000).

CONCLUSION

The present study aimed to help veterinarians and breeders to identify the strengths and weaknesses of the "milk sector in Algeria" and to better identify the methods of diagnosis governing the therapeutic protocols of endometritis, such as antibiotic therapy and hormonal therapy as well as the means of prevention taken in this sense, in order to reduce infertility in cows.

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ANNEXURE 1:

1. How many dairy farms are there in your region? .....
2. What is the number of dairy cows on each farm? .....
3. Rank the frequency of endometritis by species from 1 to 4:

   Equine [ ] - Sheep [ ] - Cattle [ ] - Goats [ ].
4. Frequency of endometritis in dairy cows compared to other disease entities (Choose one answer only)?

   - > 10 % - 10 à 15 % - 15 à 30 % - 30 à 40 %
5. Are the majority of cases treated?
   (Rank in order of importance from 1 to 2): meat cattle [ ] dairy cattle[ ]
6. Which season did you report the most cases? :

   - Winter [ ] - Spring [ ] - Summer [ ] - Autumn [ ]
7. Highest frequency of endometritis according to calving rank (Tick one box only)

Calving rank	Calving 1	Calving 2	Calving 3	Calving 4	Calving 5
Maximum cases observed					

8. Circumstances of appearance of endometritis
   (Rank in order of importance from 1 to 3)

   - Non-dystocic calving [ ] - Dystocic calving [ ] - Non-delivery [ ]
9. Complications of uterine infection (Rank in order of importance from 1 to 2)

   septicaemia [ ] infertility and infecundity [ ]
10. Antibiotics and anti-inflammatory drugs often administered systemically (Only one answer)

    Protocol 1: Tetracycline added to corticoids [ ]

    Protocol 2: Tetracycline added to non-steroidal anti-inflammatory [ ]

    Protocol 3: Betalactamines added to corticoids or peni-streptomycin and non-steroidal anti-inflammatory drugs [ ]

    Protocol 4: sulfonamides added to corticoids [ ].
11. Hormone-based products used for the treatment of endometritis (One answer only)?

    - Synthetic analogues of prostaglandins F2α (Estrumate®) [ ]

    - Estrogens [ ]

    - No hormonal treatment [ ]