Ovarian cysts in cattle: a survey among veterinary practitioners in Algeria

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Abstract

Ovarian cysts (OC) are among the major factors affecting dairy cattle fertility due to their impacts on reproductive performance. Extension of the calving-calving interval and the costs of treatment associated with this pathology are the main sources of economic losses for the dairy industry. This study involved conducting an epidemiological survey relating to ovarian cysts in cows based on the observations of veterinary practitioners in Algeria. This survey was performed using a questionnaire distributed to 103 practicing veterinarians in different regions of Algeria. According to the responses, OC dominated all ovarian diseases, followed by smooth ovaries and ovarian adhesions. Ovarian tumours were encountered very rarely. In general, veterinarians considered any follicular structure greater than 20 mm in diameter and persisting for at least 10 days to be cystic. The aetiology was multifactorial, and the following were cited: alimentation, high milk production, puerperal pathologies (metritis, retained placenta), postpartum, age, and winter season. Anoestrus was often the most observed behaviour in cystic cows, accompanied by changes in the genital tract, namely the cervix and uterus. As a consequence, in most cases, OC was associated with a delay of first insemination and conception. The use of hormones, especially $PGF_{2\alpha}$ and GnRH, to treat OC was the most widely used method in the field. Clinical recovery was obtained approximately 11-15 days after the beginning of treatment, though the risk of recurrence was appreciable. The majority of vets interviewed promoted the prevention of OC. They advised breeders to improve feeding and hygiene conditions, especially during calving. Medical prevention was based on the use of hormones ($PGF_{2\alpha}$ and GnRH). Though the survey showed varying results, they were generally consistent with the literature.

Key words: *cystic; ovary; cows; survey; veterinarian*

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Introduction

Reproductive performance of cows is among the major concerns of breeders and their technical supervisors, especially since performance has tended to decrease over the years in dairy farms around the world (Samardžija et al., 2006; Diskin and Morris, 2008; Dobranić et al., 2008; Kočila et al., 2013; Szenci et al., 2018; Folnožić et al., 2019a, 2019b; Đuričić et al., 2020; Kovacs et al., 2020).

Performance plays a key role in farm economics, not only in determining animal performance but also in decisions concerning selection and culling. Ideally, the calving-calving interval should be around one year in order for the animal to be more profitable (Vanholder et al., 2005; Yousefdoost et al., 2012; Đuričić et al., 2020). However, the evolution of this parameter shows a clear deterioration, which will inevitably lead to an increase in operating costs: economic costs of additional inseminations, loss of time due to insemination failures, and the treatment of animals with reduced performances. These poor results can be linked, in the majority of cases, to the deterioration of fertility. This has particularly been observed in animals of the Prim'Holstein breed. This could be a consequence of genetic improvement for milk production and changes in husbandry conditions (Lucy, 2001; Jeengar et al., 2014).

Research on issues of infertility and infecundity is complex. These two parameters are considered examples of pathological entities with a negative economic impact, qualified as "production diseases", and characterized by their subclinical manifestation, multifactorial origin, and often questionable economic consequences (Hanzen, 1994; Samardžija et al., 2008; Folnožić et al., 2016). Under the best breeding conditions, 4 to 8% and even up to 15.6% of dairy cows suffer from infertility (Nadeau, 1968). Epidemiological studies have suggested that pathological factors (mastitis, placental retention, ovarian cysts) have a greater impact on fertility compared to other non-pathological factors, including BCS and milk production (Lucy, 2001; Kočila et al., 2009; Đuričić et al. 2012a,b, 2013, 2014; Folnožić et al., 2015; Aladrović et al., 2018). In Algeria, although reproductive pathologies constitute a major problem in the cattle industry (Nadeau, 1968), very little is currently known about the nature of these pathologies and their true incidence on Algerian farms. Among these pathologies are ovarian cysts (OC), one of the major factors affecting the fertility of dairy cattle, with repercussions on reproductive performance (Mimoune et al., 2017). The lengthening of the calving-calving interval and the costs of treatment associated with this pathology are a source of economic losses for the dairy industry (Vanholder et al., 2005; Turk et al., 2016; Turk et al., 2020).

In recent decades, OCs have been the subject of several studies linked to their clinical characteristics (Mimoune et al., 2017), aetiology and pathogenesis (Mimoune et al., 2019a,b), and diagnosis and treatment (Brito and Palmer, 2004). Despite this research, certain aspects of OC remain unknown and inconclusive, such as the lack of a precise definition (Vanholder et al., 2005). Therefore, the aim of this study was to implement an epidemiological survey relating to ovarian cysts in cattle, based on the observations and knowledge of practicing veterinarians. It aimed to compare published data and field results, as expressed by these veterinarians.

Materials and methods

This survey was carried out as a questionnaire distributed to 180

veterinary practitioners throughout the different regions of Algeria: Jijel, Constantine, Bordj Bouarreridj, Saïda, Laghouat, Sétif, Ain Defla, Médéa, Blida, Chlef, Tiaret, Adrar, Boumerdès, Tizi ouzou.

Description of the questionnaire

The questionnaire was prepared according to the plan and the following parameters (annex):

- information about the veterinarians (identity and years of exercise). All veterinarians with more than 5 years of experience in the field were included in the study;
- ranking the different ovarian diseases in order of frequency (to show the importance of OC);
- definition of the type(s) of OCs encountered in current practice;
- aetiology of OC;
- clinical description of OCs and their consequences;
- curative and preventive treatments commonly prescribed by veterinarians, and their results.

In general, this questionnaire used the multiple-choice system, the veterinarian having (with the exception of a few spaces to add comments if desired), only to tick the box corresponding to the appropriate choice. This system had the advantage of allowing better subsequent use of the data obtained.

Interpretation of the questionnaire

After the completed questionnaires were submitted, they were classified according to the responses given for each of the parameters treated (above). The results were put in tables showing the number and frequency of responses.

Statistical analysis

Statistical analysis was carried out using STATISTICA software (Version 10, Stat Soft France, 2003). Statistical differences in the responses obtained from the interviewed veterinarians and data containing the description of the different aspects of OCs were analysed by Chi-square test. The results were expressed as a percentage. The level of significance was set at $P<0.05$.

Results

In this study, among the 180 questionnaires distributed to the veterinary practitioners, 103 were returned. However, several empty boxes (no answer) and or even a percentage greater than 100 (several answers for the same question) were observed in some questionnaires.

Table 1. Distribution of responses concerning the frequency of ovarian diseases

Ranking	Ovarian diseases	%
1	Ovarian cysts	62
2	Smooth ovaries	25
3	Ovarian adhesions	18
4	Ovarian tumours	3
5	Persistence of corpus luteum Ovaritis Abscess	2 1 1
***P* Value**		<0.001

Ovarian diseases ranking in order of frequency

Table 1 presents the different ovarian conditions with approximate frequencies according to the responses of veterinary practitioners.

According to these results, the most frequent ovarian disease encountered was OC, followed by smooth ovaries and adhesions. Tumours and other afflictions, such as persistent corpus luteum, oophoritis and abscesses, were infrequently observed.

OC definition

According to Table 2, more than half of vets (50.48%) described OC as a structure with a diameter greater than 20 mm. However, around (30%) proposed a diameter greater than 17 mm, while others (19.42%) considered that the diameter of OC was > 24 mm.

In most responses (89.32%), the cyst on the ovary persisted for at least 10 days. On the other hand, in 10.68% of cases, it did not exceed 7 days. The right ovary was more affected (69.90%) by OC than the left ovary (30.09%).

According to the veterinarians, the incidence of follicular cysts (FC) was higher than that of luteal cysts (LC) (60.19% *vs.* 39.80%) and polycystic ovary was less common than the single cyst ovary (25.24% *vs.* 74.76%), where OC type was determined based on wall thickness).

OC aetiology

The analysis of responses received from veterinarians, as presented in Table 3, showed that the factors responsible for OC were many and diversified.

The main aetiological factors were considered alimentation and high milk production, at nearly equal frequencies (90.29% and 85.43%, respectively).

Metritis, postpartum, retained placenta and age were also cited with relatively high frequencies and therefore were important aetiological factors at the origin of OC (with frequencies of 67%, 60.19%, 58, 25%, 55.33%, respectively).

For season, winter was the most frequent season for the appearance of OC (52.42%), followed by autumn (19.42%) and summer (13.59%), and finally spring (8.74%).

Other factors were cited in decreasing order of frequency: hygiene (30.10%), heredity (26.21%), twinning (16.50%), climate (10.68%) and limping (6.79%).

Some veterinarians added other factors with lower frequencies including hormonal disorders (8.74%), followed by poor control of reproduction

Table 2. Distribution of responses concerning the definition of ovarian cyst

OC		Number	%	*P* Value
Diameter	> 17 mm > 20 mm > 24 mm	31 52 20	30.09 50.48 19.42	<0.001
Persistence	> 7 days >10 days	11 92	10.68 89.32	<0.001
Affliction	Right ovary Left ovary	72 31	69.90 30.09	<0.001
Type	FC LC	62 41	60.19 39.80	<0.001
Number	Unique Polycystic	77 26	74.76 25.24	<0.001

Table 3. Distribution of responses according to the factors causing OC

Factors	%	Factors	%
Alimentation	90.29	Climate	10.86
Milk production*		Season:	
high	85.43	Winter	52.42
Low	14.56	Summer	13.59
		Spring	8.74
		Autumn	19.42
Age	55.33	Hygiene	30.10
Heredity	26.21	Artificial Insemination	1
Twinning	16.5	Poor reproduction control	1
Post-partum	60.19	Medication use	1
Metritis	67	Hormonal disorders	8.74
Lameness	6.79	Lack of cobalt	1
Retained placenta	58069		
P Value: The difference was statistically significant ($P<0.05$)			

(*According to the veterinarians, the threshold value for high or low production is 35 litres per day)

Table 4. Distribution of responses according to the symptoms associated with OC

Symptom		Number	%	*P* Value
Behaviour				
	Permanent anoestrus	37	35.92	< 0.05
	Permanent oestrus	21	20.39	
Cervix				
	Open	38	36.89	<0.05
	Closed	58	56.31	
	Secreting	35	33.98	
	Normal	41	39.80	
Uterus				
	Oedematous	29	28.15	<0.05
	Toned	16	15.53	
	Flaccid	14	13.59	
	Little or no change	58	56.31	

parameters, artificial insemination, use of drugs and lack of cobalt, each with a frequency of 1%.

Clinical study

Observed signs

According to the responses of veterinarians (Table 4), anoestrus was the most frequently observed behaviour in cystic cows (35.92%), followed by hyperoestrus (20.39%).

Regarding changes to the genital tract, the cervix was closed in 56.31% of cases. It was normal, open or secreting at similar frequencies (39.80%, 36.89%, 33.98%, respectively). During OC, the uterus was

modified little to not at all in most cases (56.31%). Some vets palpated an oedematous uterus in 28.15% of cases. A toned or flaccid uterus was palpated in 15.53% and 13.59% of the cases, respectively.

OC consequences

The first consequence of the OC observed by veterinarians was a delay in first insemination and conception, as revealed in 67.96% of cases. The second parameter was definitive sterility (17.47%) (Table 5). However, 13.59% of the veterinarians observed no effects of OC on cow fertility. Other observed consequences are listed in decreasing frequency: repeat breeding (4.85%), poor general condition and a drop in milk production, and metritis and a retained placenta (each 2.91%).

OC treatment

Non-hormonal curative treatment

The non-hormonal curative treatment most used by veterinarians was manual rupture in 37.86% of the cases. Transrectal puncture was rarely performed (3.88%). Other treatments were cited by the practitioners, such as stimulation of the clitoris during permanent oestrus (5.82%) (Table 6).

Hormonal curative treatment

According to the responses, $PGF_{2\alpha}$ was the most widely used hormone in the field with a frequency of 54.37%, followed by GnRH (45.63%) (Figure 1). hCG (Human Chorionoc Gonadotropin) and progestogens were less frequently used (34.95% and 33%, respectively). The Ovsynch protocol was the last resort for practicing veterinarians, with a frequency of 8.73% ($P<0.05$).

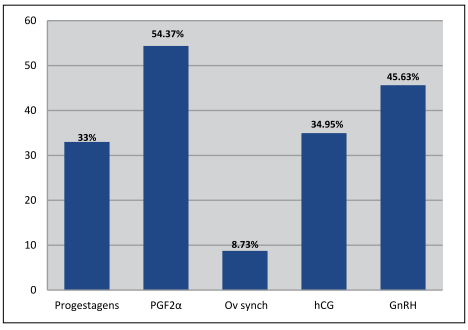

Figure 1. Hormonal treatment of the cows with OC

Table 5. Distribution of responses of observed consequences of OC

Consequence	Number	%	*P*
Delay of first insemination and conception	70	67.96	<0.05
Definitive sterility	18	17.47	
No consequence	14	13.59	
Repeat breeding	5	4.85	
Poor general condition and drop in production	3	2.91	
Metritis and retained placenta	3	2.91	

Table 6. Distribution of responses according to the type of non-hormonal curative treatment performed

Non-hormonal treatment	Number	%	*P*
Manual rupture	39	37.86	<0.05
Transrectal puncture	4	3.88	
Stimulation of the clitoris during permanent oestrus	6	5.82	

Preventive treatment

In this study, 40.78% of veterinarians recommended systematic preventive treatment for OC, 33% stated that they recommended it often, while 13.59% said they had never done so ($P<0.05$) (Figure 2).

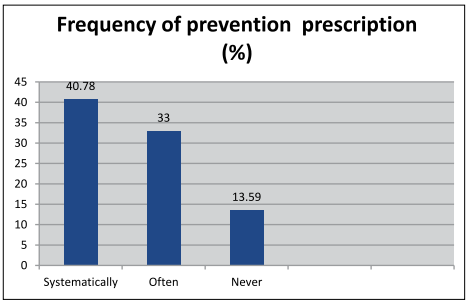

Figure 2. The frequency of prescription of OC prevention

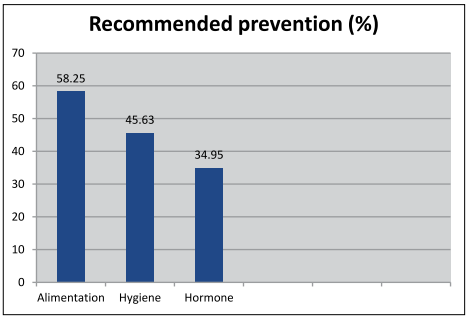

Figure 3. Type of recommended prevention

Among veterinarians, 58.25% asked the breeders to correct the feed ration of cows to prevent OC, while 45.63% recommended hygienic measures. Medical prophylaxis was recommended by 34.95% of veterinarians ($P<0.05$) (Figure 3).

The type of hormone treatment was not mentioned by all the veterinarians. Some vets cited $PGF_{2\alpha}$ and GnRH with the same frequency (15.53%), in comparison to the 1% frequency for all other recommended preventive medical methods (Table 7).

Results of treatment

Regarding the monitoring of treatment results, 73.78% of the veterinarians looked for and knew the result of their treatment, as opposed to 26.21% who did not ($P<0.05$).

Clinical recovery from OC was the result obtained after treatment in 58.25% of cases. The incidence of newly formed OC was not negligible, at 41.75% ($P<0.05$).

The average time between the start of treatment and clinical recovery was between 11 and 15 days according to 13.59% of the veterinarians, while 10.68% reported recovery between 3 and 5 days, and 8.74% between 6 and 10 days. Other periods were mentioned less frequently: between 16-20 days, ≥21 days and some

Table 7. Data according to the recommended preventive medical treatment

Medical prevention	Number	%	*P*
$PGF_{2\alpha}$	16	42.10	<0.05
GnRH	16	42.10	
Antibiotics + vitamin A	1	2.63	
hCG	1	2.63	
Antibiotics + oxytocin	1	2.63	
Oxytocin + $PGF_{2\alpha}$	1	2.63	
$PGF_{2\alpha}$ + oestrogens	1	2.63	
$PGF_{2\alpha}$ + GnRH	1	2.63	

did not specify the number of days. All of these intervals (or delays) had the same frequency of 4.34% (Table 8).

Table 8. Approximate time to clinical recovery after initiation of treatment

Recovery time (days)	Number	%	*P*
[3-5]	11	10.68	<0.05
[6-10]	9	8.74	
[11-15]	14	13.59	
[16-20]	5	4.85	
≥21	5	4.85	
Few days	5	4.85	

Discussion and conclusions

The objective of this study, conducted in a questionnaire to which 103 veterinarians responded, was to describe OC as it is perceived by Algerian veterinary practitioners, and to compare the observations in the field with data from the literature.

The results obtained in our investigation showed that OC was the major pathology of the ovary, followed by smooth ovaries and adhesions. Tumours were rarely observed in the field and their incidence was very low. Our data corresponds to reports by Hatipoglu et al. (2002) and Mimoune et al. (2016). Other abnormalities were also cited by three veterinarians, each reporting cases of persistent corpus luteum (associated in the majority of the cases with a severe infection of the uterus), abscesses and oophoritis. Their very low incidence was in agreement with the results obtained in a previous study (Mimoune et al., 2017).

More than half of veterinarians surveyed defined OC as a follicular structure with a diameter > 20 mm, corresponding to the results of Peter (1997) and Calder et al. (1999). A diameter > 17 mm was also mentioned, which is in agreement with the results of Ginther et al. (1989) and Silvia et al. (2002). Other veterinarians retained a diameter > 24 mm to describe OC in accordance with the results of several authors (Garverick, 1997; Vanholder et al., 2006; Santos et al., 2009; Mimoune et al., 2017).

The majority of veterinarians noticed an OC persistence of 10 days or more, while a small percentage mentioned a minimum persistence of 7 days. These results were reported by different authors (Calder et al., 1999; Silvia et al., 2002; López-Gatius et al., 2002; Vanholder et al., 2006; Santos et al., 2009). In fact, Calder et al. (1999) and Silvia et al. (2002) performed the P4 assay and ultrasound examination, respectively, to better describe OC. In Algeria, vets generally used rectal palpation to diagnose OC in cattle because of the high costs of ultrasound examination and hormonal assays.

According to our results, the right ovary was more affected by OC than the left one. This corresponds to reports by Kaikimi et al. (1983) and Mimoune et al. (2017). Furthermore, FC was more common than LC, in agreement with the results of Garverick (1997). Indeed, veterinarians classify ovarian cysts in relation to the thickness of the wall; where thinness indicates FC, and thickness indicates LC. It is well known that the choice of a therapeutic strategy depends on the degree of accuracy of the diagnosis of OC type (FC or LC). In most cases, the cyst was unique on the ovary although the incidence of polycystic ovary was not negligible. However, it remains lower than that reported by Silvia et al. (2002) which was 47%.

The aetiological factors of OC mentioned in the literature are varied. Apart from hypothalamic/pituitary and ovarian/follicular dysfunctions, these include:

- increased milk production (López-Gatius et al., 2002) and negative energy balance (NEB) during the postpartum period in high producers (Leroy et al., 2004; Mimoune et al., 2019b);
- lactation level and calving rank (López-Gatius et al., 2002);
- inheritance (Hooijer et al., 2001) and twinning (Kinsel et al., 1998);
- puerperal pathologies such as metritis and retained placenta, as well as lameness;
- nutrition around calving (López-Gatius et al., 2002; Mimoune et al., 2019a);
- season (López-Gatius et al., 2002; Mimoune et al., 2017).

Veterinarians observed the same factors, though at differing frequencies. The most important frequencies were related to nutrition and milk production, followed by metritis, postpartum, retained placenta and age; the frequencies of which were considerable and were closely related to each other. OC is associated with the high milk production (López-Gatius et al., 2002). Several reports demonstrated that the OC incidence tripled when milk production doubled. Conversely, several studies did not report any association between OC and milk production. Nevertheless, a negative energy balance during postpartum for highly productive cows is accompanied by different metabolic and hormonal changes that affect the reproductive function at the hypothalamic-pituitary axis and ovary/follicle level (Lucy, 2001; Mimoune et al., 2019b).

According to López-Gatius et al. (2002), the increase in body score (scale 1 to 5) on the 60th day before calving increased the risk of OC development due to a significant mobilization of fat reserves. Cows undernourished during PP are also predisposed to OC (Mimoune et al., 2019b). Cows affected with a disease during the PP period (retained placenta, metritis and lameness) were 1.4 to 2.9 times more likely to develop OC than cows unaffected during that period (López-Gatius et al., 2002). In the case of a uterine infection, cortisol and endotoxins released in large numbers can act synergistically and cause OC. Intrauterine infusion of *E. coli* endotoxin increases the level of cortisol and suppresses the influx of LH (Jackson et al., 2011; Mimoune et al., 2019b).

According to the results, the winter season is the period in which animals are most affected by OC; this is in agreement with the results of Morrow et al. (1966). Baitlesov et al. (2007) reported that this season is associated with a lack of exercise, and mineral or vitamin deficiency, especially selenium and vitamin E, which can lead to OC formation.

The other factors cited, though at lesser frequencies, were: hygiene, inheritance, twinning, climate, lameness, in agreement with different studies (Vanholder et al., 2006; Mimoune et al., 2019b), and others have been added by a few vets namely:

- hormonal disorders (we did not put this parameter on the questionnaire because we based it on everything relating to observations in the field, far from the physiopathogenic mechanisms occurring during OC). In this context, the most accepted hypothesis explaining the OC formation is that the release of LH (luteinizing hormone) by the hypothalamic-pituitary axis is altered (Mimoune et al., 2019b).
- poor control of reproduction parameters (diet and postpartum were part of this).
- drug use (vets did not specify the type or name of drugs causing OC). In the literature, ACTH (Dobson, 2000) and corticosteroids (Bosu and Peter, 1987) are

well known as factors causing OC. It is possible that these vets were thinking about the anarchic use of treatments, especially those designed for heat synchronization.
- artificial insemination.
- lack of cobalt.

These last two parameters were not mentioned in the literature. Therefore, their correlation with the occurrence of OC was not found.

As mentioned in different studies, anoestrus was the most observed behaviour but the incidence obtained in this study was lower than that reported by Bierschwal et al. (1975) and Elmore et al. (1975), which were 62% and 85% because there were no answers in more than 40% of the boxes, as veterinarians either did not notice changes in behaviour during the OC or could not roughly estimate the frequencies of each state. The incidence of hyperoestrus was not negligible, considering the percentage of vets who responded. All of the changes in the reproductive tract associated with OC and described in the literature were cited by the veterinarians with varying percentages. The diagnostic of OC established by veterinarians is based on the history of the animal affected (behaviour) and the result of rectal palpation. However, although nymphomania characterizes FC and anoestrus behaviour is noted in LC, it is also possible that cows with either type of cyst may show variable behaviour. Therefore, it seems essential to use ultrasound examination or P4 analysis in association with rectal palpation, because incorrect diagnosis of OC type (FC or LC) leads to inadequate treatment (Mimoune et al., 2017).

Based on the results of our survey, most veterinarians noted a delay of first insemination and conception, as also reported by Brito and Palmer (2004). Other vets noted a much lower degree of permanent infertility, while others mentioned no influence of OC on reproductive performance. These results always depend on the frequency of the interventions of veterinarians in the case of OC, and the frequencies of the second examination if it was carried out.

Several vets mentioned other consequences such as:
- repeat breeding (not reported elsewhere);
- poor general condition and drop in milk production (considered to be symptoms although the cystic cow has little or no change in general condition);
- metritis and retained placenta (aetiological factors at the origin of the cyst).

Despite trauma and resulting haemorrhage (Seguin, 1980), manual rupture remains the non-hormonal treatment most used by veterinary practitioners, while puncture, which is less dangerous (Viana et al., 2003), is rarely performed. Other methods that have proven their success in the field according to our vets were used, such as stimulation of the clitoris in case of hyperoestrus in order to trigger hormonal secretions. Veterinarians who did not answer this question do not use this type of treatment and prefer hormonal therapy.

The two most widely used hormones in practice were $PGF_{2\alpha}$ and GnRH. $PGF_{2\alpha}$ is the most effective treatment for LC (Leslie and Bosu, 1983), while GnRH is the classic treatment for OC according to Peter (2005), since it is less antigenic and less expensive than hCG.

hCG and progestogens also hold a place in the field, with similar frequencies but less than the two most widely used hormones. The roles of hCG (Roberts, 1971) and progestogens (Mc Dowell et al., 1998; Calder et al., 1999; Douthwaite and Dobson, 2000) in the treatment of OC

have been proven, although hCG has the disadvantages cited above.

To a much lesser degree, the Ovsynch protocol was less frequently used by our veterinarians, although it has been implicated in the programs of synchronization of heat and ovulation (Hanzen et al., 2003a,b), likely due to the costs of this protocol.

The results of our survey showed that practicing veterinarians attached particular importance to improving feeding and hygienic conditions at the time of calving to limit the frequencies of puerperal diseases and stress. This corresponds to the recommendations of Hooijer et al. (2001).

Medical prevention was practically dominated by the two hormones mentioned, $PGF_{2\alpha}$ and GnRH. This agrees with the result reported by Richardson (1983).

According to our survey, most vets wanted to know the outcome of their treatment. On the one hand, they were curious to know the effectiveness of their intervention and to bring out the best treatment to apply, while on the other, they tried to keep their customers though these efforts.

More than half of cows with OC recovered around 11 to 15 days after the start of the treatment, while 39.80% suffered a recurrence. This result is consistent with that found by Peter (2004), who reported a frequency of OC turnover of 35%, and is significantly lower than the incidence reported by Cook et al. (1990) of 56.52%. It should be noted that the healing time also depended on the type of treatment.

Finally, this study highlighted the knowledge of practicing veterinarians on OC in cows in Algeria, especially since the results of the survey have shown that OC is the most dominant pathology among all ovarian disorders. Analysis of the contributing factors associated with OC revealed the role of diet, milk production, puerperal pathologies and season in the onset of this pathology. Identifying the type of OC is always a challenge that is trying for practicing veterinarians when treatments fail and resumption of cyclicity and gestation is delayed. The economic repercussions of OC make it possible to understand the interest of ultrasound and the progesterone assay, as invaluable tools in the diagnosis of such pathology that should be reintroduced as common diagnostic tools for all veterinary practitioners.

It is clear that nutrition is directly related to the reproductive function of dairy cows. Feed in excess or in deficient quantities is surely capable of influencing reproductive status. The basic problem is that the degree of excess, insufficiency or imbalance that disrupts reproduction will not be determined early, hence the value of early detection.

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Ciste jajnika u goveda: istraživanje veterinara u Alžiru

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Ciste jajnika (OC) su jedan od ključnih čimbenika koji utječu na plodnost mliječnih krava, zbog njihovog učinka na reproduktivnu sposobnost. Produženo međutelidbeno razdoblje i troškovi liječenja povezani s ovom patologijom izvor su ekonomskih gubitaka za mliječnu industriju. Stoga, ova studija ima za cilj provesti i iskoristiti epidemiološku anketu u svezi cista jajnika u krava na temelju opažanja veterinara u Alžiru. Ova anketa provedena je uporabom upitnika koji je podijeljen 103 veterinara u različitim regijama Alžira. Prema odgovorima, OC je dominantna među svim bolestima jajnika, nakon čega slijede glatki jajnici i adhezije jajnika. Tumori jajnika su vrlo rijetki. Općenito, veterinari su trebali dijagnosticirati bilo kakvu folikularnu strukturu veću od 20 mm promjera koja traje dulje od 10 dana kao cističnu. Etiologija je bila višeznačna, a naveli su slijedeće: hranidbu, visoku proizvodnju mlijeka, kao i puerperalne patologije (metritis, zaostala posteljica), puerperijum, dob i zimsko razdoblje. Anestrus je bio najčešće zamijećena patologija u cističnih krava, a popraćen je promjenama u genitalnom traktu, odnosno vratu maternice i u maternici. Posljedično, u većini slučajeva, OC je povezan s odgodom između prve inseminacije i začeća. Uporaba hormona, posebice $PGF_{2\alpha}$ i GnRH, za liječenje OC-a bila je najrašireniје rabljena metoda na terenu. Klinički oporavak postignut je oko 11-15 dana nakon početka spomenutog liječenja, ali rizik od ponovne pojave OC je bio značajan. Većina intervjuiranih veterinara bila je za prevenciju OC-a. Uzgajivačima su preporučili poboljšanje hranidbe i higijenskih uvjeta, posebice u vrijeme teljenja. Medicinska prevencija temeljila se na uporabi hormona ($PGF_{2\alpha}$ i GnRH). U konačnici, provedena anketa pokazala je različite rezultate, ali su se oni uglavnom podudarali s literaturnim podatcima.

Ključne riječi: *ciste, jajnik, krave, anketa, veterinar*