A Survey of Cystic Ovarian Disease in Practice

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Abstract

The "DAISY" computerised recording system (University of Reading) was used to look at records of Cystic Ovarian Disease (COD) over two 12 month periods in a cattle practice in south west England.

Over 24 dairy herds with good records were assessed to include 190 cows in year 1 and 180 cows in year 2 presented with COD.

A definition of the disease was established as a fluid filled structure on the ovary exceeding 25mm in diameter with no palpable luteal structure present.

The economic effect of the disease was compared both within herds and between herds to assess the importance of the condition. At the incidence levels recorded there was no effect on overall herd performance although the condition did affect individuals quite profoundly. Age incidence showed a lower level of COD in 1st lactation animals. Older cows had a relatively constant incidence which followed the age profile of the herds.

The overall pregnancy rate was very high (81 - 89%). Treatments consisted of those with and without manual rupture of the cyst, with and without Gonadotrophin Releasing Hormone (GnRH), and with and without Progesterone treatments. Some cases received no treatment at all. The survey showed there was no difference in outcome between treatments involving cyst rupture and those not and that there was no difference between treatment and non treatment involving progesterone or GnRH. GnRH showed a longer interval to subsequent service than rupture or progesterone and there was a lower incidence of recurrence using progesterone treatments. The presenting signs of COD show that in dairy herds with a high level of routine fertility involvement nymphomania or nyphomanism is not common. The clinical presentation of COD in the study herds was 17% at a pre-breeding examination, 58% in cows presented with no observed oestrous, 12% at a negative pregnancy diagnosis, 12% with an irregular heat or service interval.

Reviewing data from a variety of veterinary surgeons is difficult. Diagnosis and treatment show considerable bias between operatives and makes it difficult to reach conclusions.

Introduction

Cystic Ovarian Disease is a relatively common reproductive disorder which may be either

- presented due to abnormal animal behaviour patterns
- found at routine fertility examinations with no clinical signs.

Many studies have been carried out on the condition and there have been a variety of conclusions reached. Bartlett and others (1986) found it increases calving intervals, increases culling rates, and thus produces significant economic losses in the dairy herd. Booth (1988) showed that rectal palpation by itself was an unsatisfactory method of diagnosing the type and more significantly the hormonal functioning of an ovarian cyst. Many authors have reported that the accuracy of diagnosis is a very important feature in treating the condition (Nanda *et al* 1988, Booth 1988, Williams and McLeod 1991). The measurement of milk progesterone is a very cheap and readily available test to help in the confirmation of cyst type or hormonal activity which will aid the choice of therapy (Booth 1988). However some reports indicate that hormonal levels such as progesterone can fluctuate markedly during the course of time with COD (Blowey 1991). This could be a reflection of changing qualities of the cyst itself or simply misdiagnosis. Cysts may be present on the ovary quite regularly in the presence of a normal *corpus luteum* and probably not of any significance.

Real time ultrasound scanning does provide a lot of information on the structure of cysts on the ovary which enables a better diagnosis and classification as well as monitoring changes after treatment (Jeffcoate, Ayliffe, 1995). However there is still great difficulty in relating ovarian cyst structure to actual hormonal function (Ribadu and others 1993).

There is little doubt that the ideal combination is to use a tangible method of diagnosis and visualisation such as scanning or manual palpation with milk progesterone sampling to determine function and then advise on the best approach to treatment.

Materials and Methods

A retrospective study was carried out using data from the University of Reading "DAISY" recording system over 2 breeding seasons 1993/94 and 1994/95. The breeding season usually involved records from June to July as most herds had a winter calving pattern. The survey covered approximately 24 dairy herds with sufficiently good fertility recording and was based on around 3,000 cows calving in each of the seasons studied. Five veterinarians were involved in the routine work on these herds with only 2 of them being responsible for 80% of the COD cows diagnosed and recorded.

This study was performed to look at the following points:

1. What is the effect on individuals of COD defined by
    a. Calving to 1st service interval (C-1)
    b. Calving to conception interval (C-Co)
    c. Number of serves per conception
    d. Overall pregnancy rates
    e. Percentage culled

2. When comparing C-Co intervals between herds both with and without COD, is there any significant effect on herd performance or economics due to COD?

3. What are the presenting signs for the diagnosis of COD

4. What is the difference in outcome between different treatments
    a. Manual rupture of the cyst *versus* no rupture
    b. GnRH *versus* no GnRH
    c. Progesterone therapy *versus* no Progesterone
    d. No treatment *versus* treatment

5. What are the limitations of using survey work such as this to look at disease conditions in practice?

A definition was used which described a cow as affected with COD if she did not have a *corpus luteum* present and there was a fluid filled structure on the ovary which was more than 25mm in diameter. All cow records were carefully inspected to determine what the exact presenting sign was for each case of COD diagnosed. Any evidence or history of irregular heats or services classified the cow as an Irregular Heat (I/H) all other reasons for examination were recorded. There was no attempt to differentiate between Follicular and Luteal cysts as very few progesterone samples were taken and manual assessment was always thought to be too inaccurate.

Results

1. Incidence of the disease (or diagnosed cases).

Table 1. Incidence of disease

Year	1993/94	1994/95
No. Herds	24	22
Average Size	111	129
Cases of COD	212	217
Cows with COD	190	179
Incidence	7%	7.9%

Table 1 summarises the findings from the 2 breeding seasons. The herd profile for the incidence of disease was very similar in both years studied (Table 2).

Table 2. Incidence with age

Year	1993/94	1994/95
Over Whole Herd	7%	7.9%
1st Lactation	6%	5.4%
2nd Lactation and Older	8%	8.8%

There is a remarkable consistency in the level of diagnosis with 7-8% of cows in the herd being affected. The incidence in heifers is lower but the older cows showed no overall trend in incidence; the age of occurrence was the same as the herd profile for ages of cows. There was a seasonal trend with 70% of the COD cows in both years calving between August and the end of January. This again follows the typical calving pattern of the herds studied. 70% of the diagnoses occurred during the winter months between October and March.

80% of cases occurred between 21 and 120 days post calving with the majority being between 41 - 90 days.

2. Economics - total herd analysis.

Table 3. Overall herd performance

Year	1993/94	1994/95
Ca-1 Days	81	83
Ca-Co Days	132	137
Herd Avg. Ca-Co Incl. COD Cows	92	93
Herd Avg. Excl. COD Cows	90	91
Overall Pregnancy Rate	81%	89%

Ca-1 is the Calving to first Service Average in days
Ca-Co is the average Calving to Conception in days
Pregnancy Rate is the % cows that became pregnant

Table 3 shows the overall herd performance with calculations done to highlight the difference between the herd performance both with and without the cystic

cows. The number of cows actually becoming pregnant shows that the culling rate is quite low compared with most herds averaging only 75% of cows calved actually becoming pregnant.

3. Presenting signs - reasons for diagnosis.

Table 4. Presenting signs for diagnosis.

Year	1993/94	1994/95
PBE	17	13
ONO	58	71
PD-	11	12
I/H	4	4
Other	2	-

Figures are for No. cases presented
Key to terms used:
PBE - Pre Breeding Examination (14-35 days Post Calving)
ONO Oestrous Not Observed (35 - 65 days post calving)
PD- Negative Pregnancy Diagnosis (Carried out at between 38 - 60 days)
I/H Irregular Heat (as presented by farmer or from records)

Table 4 lists the recording on the "DAISY" records for each case of COD. All records were carefully checked for any evidence of irregular oestrous either through services or heats entered as well as the category chosen by the veterinarian.

4. Treatments.

As treatments were very heavily biased to the diagnosis, the particular cow, and the veterinarian involved, the best comparison that could be done was to look at 4 main treatments and look at the COD cows treated "with" this broad category and "without" (Table 5.)

Table 5. Results of Treatments - number of serves per treatment case

Treatment	Days From Treatment to Service				
	0 - 21 Days	21 Days Plus	No Serve	Total treated	% Served <21 Days
Rupture	54	28		82	66
No rupture	78	40		118	66
GnRH	42	25		57	56
No GnRH	104	44	1	147	71
Progest.	36	14		50	72
No progest.	101	60		161	63
No Treatment	12	11	3	26	46

The "without" cows would have received a variety of other treatments. A small no treatment group was also looked at. The data shown are for one year only, 1994/95. The number of cows requiring repeat treatments showed that on average the repeat rate was around 30% but the use of GnRH had a 44% repeat treatment rate (repeat to any treatment) and the use of

Table 6. Success rate of treatment -repeat treatments refer to any repeat treatment not necessarily the same. Overall success is the percentage cows that became pregnant.

Treatment	Overall Success %	Repeat Treatments %
Rupture	87	29
No Rupture	84	29
GnRH	79	44
No GnRH	84	24
Progest.	84	6
No progest.	81	35
No Treatment	54	N/A

progesterone devices was only 6% repeats to any other treatment.

There were too few "no treatment" cows to draw any comparison with treatment of any kind.

Discussion

The incidence of the disease in cattle shows a remarkable consistency between the 2 seasons studied. The overall incidence is 7-8% of all cows calving in the herds sampled.

There is little else to conclude from the incidence other than 1st lactation animals are less likely to be affected than the older cow. The distribution of the COD cows was otherwise much as would have been expected from the herd profile

- more cows calving in the winter months gives a higher incidence.
- older cows followed the general age profile of the herd with a relatively constant incidence.
- most cows were affected between 28 and 120 days which would coincide with the time they are being subjected to most routine fertility examinations.
- more cases occur in winter possibly reflecting lactation pressures along with the possibility of poorer feeding. Certainly work from Sweden indicated that when levels of beta hydroxy butyrate were high in herds was an increased incidence of the condition (S.H.S. 1984).

There was no attempt to try and link genetic factors to the incidence of disease although this is certainly very possible.

The economics of the disease demonstrate a clear effect on the individual but a negligible effect on the herd as a whole. This was also confirmed by other workers using simulation models (Scholl 1992). He used model simulation to record what was the effect of altering parameters related to the incidence of COD and other general management factors. The result was that COD produced no effect on herd performance but attention

to general management very significantly improved herd fertility targets. Reducing the incidence of COD is as demonstrated here less important than improving overall herd management e.g. oestrous detection and serves per conception.

The overall pregnancy rate of the COD cows was very high. This may reflect a determination to make sure these cows get in calf or as we have observed in practice COD cows when they do resolve and settle down to normal cycles are more fertile. In fact there is good argument for leaving them alone for a period to settle down before trying to serve them. This phenomenon can usually be observed in Embryo Transfer when superovulation, especially using drugs such as Pregnant Mare Serum Gonadotrophin produces a level of COD in the ovary. These cows often breed very well provided superovulation and ET are not used too regularly to produce reproductive tract damage.

The presenting clinical signs show that in herds that have a high level of routine fertility interference, there is a very low level of the traditional nymphomania or nyphomanism expressed by COD cases. By far the majority are picked up at routine visits when they are presented as no oestrous being observed. Anoestrous activity appears to be a dominant feature of the early COD cow.

Treatments presented problems for analysis and there was no consistent pattern which reduced the number of cases in any particular category to an insignificant number. The decision was made to chose treatments on the basis of the fact that they included or excluded a specific therapy - Manual Rupture, the use of GnRH, the use of a Progesterone device, and no treatment at all.

The success of treatment was looked at for overall response, the length of time for the next service to occur after treatment and the number of repeat treatments required.

Table 5 shows that there is a tendency for any treatment case involving the use of GnRH to have a longer interval to subsequent service. There also appears to be a marginal advantage in time saved to service by using a Progesterone device though this is probably not significant.

The most interesting feature of the treatment outcomes is that the use of manual rupture produced no deleterious effects on the reproductive tract and subsequent fertility. Table 6 shows that the overall success rate is remarkably constant for all treatments but there is a very strong tendency for any cow treated with a progesterone device to have a very much reduced chance of a repeat treatment.

This needs to be taken in context as repeat treatment does not necessarily refer to the same treatment being used. Many cows are treated with prostaglandin after GnRH to produce lutyolsis of the luteinised cyst. These cows will have a high repeat treatment rate as assessed by this method, however, there is a tendency for a prolonged treatment to service interval using this system.

In conclusion a dairy herd receiving regular routine fertility attention is likely to present COD cows as non cyclic. These cows are overall probably quite fertile. The economics of the individual are significant but on a herd basis they probably play no significant role in reproductive performance. This study also outlines the severe limitations of retrospective clinical data where the operator and the choice of cow is not in any way controlled. It can give some insight into certain conditions but it needs careful assessment and scrutiny before conclusions are reached. Individual veterinarians all assess clinical cases differently and have their own special criteria for the choice of a treatment.

References

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