Critical appraisal – Randomised controlled trial questions

Tison et al. 2017

| **Introduction** | |
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| Are the aims clearly stated? | Yes |
| **Methods** | |
| Is the study design suitable for the aims? | Yes |
| Which population was studied? | Convenience sample of 18 commercial dairy farms in Quebec, Canada. 1247 animals started the trial |
| Were the treatments randomly allocated?<br><br>If yes, how was the randomisation done? | Yes<br><br>Coin toss |
| Were the groups comparable prior to intervention? | Primiparous numbers and DIM not different between groups. |
| Was the person who administered the interventions blinded? | Not stated but unlikely due to treatments. |
| Is it clear what measurements were carried out in the study? | Yes |
| Were the correct measurements chosen?<br><br>Do they reflect (or are they strongly related to) the outcome of interest? | Yes<br><br>Yes |
| Were previously established validated methods used to make the measurements? | No reference was given for the transrectal palpation or vaginoscopy procedures. The scale |

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| (e.g. Glasgow pain score, International Units etc) | used to describe the purulent discharge has been published previously (0-4 scale, a score of 2 or more was considered positive) |
| What outcomes were measured? | First service conception rate, time to pregnancy up to 300DIM, presence of discharge in the vagina, any bacterial growth cultured from a cytobrush sample from the vagina |
| Are the outcomes clinically relevant? | Yes |
| Were the outcomes assessed blind? | Not stated |
| Are the statistical methods described? | Yes |
| Was the statistical significance level stated? | Yes |
| Was the sample size justified? | Yes – sample size calculation was carried out |
| Was ethical approval obtained? | States that all procedures were approved by the Institutional Animal Care Committee of the University of Montreal |
| Are the methods described in enough detail that you could repeat them? | Yes |
| **Results** | |
| Were the basic data adequately described? | It would have been good to have more information about the status of the cows within each of the 18 herds |
| Do the numbers add up?<br><br>Are all subjects accounted for? | All removals were explained. Almost 1/6 of animals were removed (n=255), mostly because of no insemination at the end of the synchronisation |

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| | protocol (n=156); but 70 cows were excluded from one single herd because of a failure to respect the synchronisation protocol, which is likely to have an impact on the results from that herd. |
| Was the statistical significance (p value) stated in the results?<br><br>Is this consistent with the methods? (It should be stated in the sample size or power calculation) | Yes<br><br>Yes |
| Were any side effects of the intervention reported if applicable? | Not stated |
| What were the main findings/key results? | Treatment with cephapirin was associated with a statistically significant improvement in first service conception rate in cows with purulent vaginal discharge ($p<0.05$), but this was those animals that had purulent discharge at the first examination and not at the second. There was also a reduced time to conception of cows treated with cephapirin compared with negative controls. |
| **Discussion and conclusion** | |
| What do the main findings/key results mean? | A significant improvement in reproductive performance when treating cows with purulent vaginal discharge with Cephapirin. |
| Are the negative findings discussed?<br><br>How are the negative findings interpreted? | Yes<br><br>Discussed issues of confounding factors, and spontaneous clinical cure. |
| Does the discussion reflect the results? | Yes |
| **Interpretation** | |

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| What are the clinical implications of this study?<br><br>Are the subjects in the study similar to those in the BET/your own? | A significant improvement in reproductive performance when treating cows with purulent vaginal discharge with Cephapirin.<br><br>Yes |
| **General** | |
| Who funded this study? | Valacta and the Quebec and Canadian Departments of Agriculture – the authors state that these are public sources of money |