

Development and analysis of an alternative method of assessing Systemic Inflammatory Response Syndrome (SIRS) in colicky horses in field conditions

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Introduction

In the evaluation of horses with colic, it is beneficial to quickly identify the presence of Systemic Inflammatory Response Syndrome (SIRS) in order to establish the appropriate prognosis and treatment. A model for predicting SIRS in horses, extrapolated from human medicine, has been previously described (Roy et al. 2017). It uses some parameters that are not easy to measure in field conditions.

The objective of this work is to develop a new model for predicting SRIS in horses with colic in field conditions.

Results and Discussion

Comparing our model with the previous published model, it can be seen that there is a strong association (χ^2 $p < 0,001$) and correlation (VCr $p < 0,001$) between the two models.

Our new model is more sensitive than the previous model (90% vs. 86.7%) and does not need to use tests that are not readily available in the field (such as white blood cell count, leucogram or PaCO₂), as lactatemia is easily measurable in the field with portable lactatometers.

| | Previous model (Roy et al, 2017) | | New field model | |
|----------------|----------------------------------|------------------|-------------------|------------------|
| | Yes (Sensitivity) | No (Specificity) | Yes (Sensitivity) | No (Specificity) |
| SRIS presence | 86,7% | 13,3% | 90% | 10% |
| Non conclusive | 66,7% | 33,3% | 66,7% | 33,3% |
| SRIS absence | 26,7% | 73,3% | 30% | 70% |

Table 1: Sensitivity and specificity of both methods with studied cases

Materials and Methods

Using the histories of the last 100 adult horses with colic treated in our hospital, a new SIRS prediction model has been developed, based on the previous model, but excluding parameters that are difficult to measure in the field (such as leucocyte count).

In addition, an SIRS_n severity scale has been developed depending on the number of altered parameters in each colic.

According to the clinical findings and lesions discovered at surgery or necropsy, all cases were classified as: presence of SIRS, absence of SIRS and inconclusive data.

SIRS:

If at least 2 of the following:

- Temperature >38.5 or <37°C
- Heart >52 bpm
- Respiratory >20 rpm (or PaCO₂ <32 mmHg)
- Respiratory >24 rpm
- Abnormal mucous colour
- Blood lactate >2,06 mmol/L
- WBC >12 or <5 cells/ μ L (or >10% band N)
- Increased Capillary Refill Time
- Presence of toxic line

Comparison with previous model (Roy et al. 2017):

- Excluded
- Modified
- Added

There is a strong association between the SIRS_n severity scoring system and the outcome of the case. This is very effective for classifying cases according to severity and for prognosis.

| | Outcome | |
|-------|---------|-------|
| | Dead | Alive |
| SRIS0 | 14,3% | 85,7% |
| SRIS1 | 19% | 81% |
| SRIS2 | 33,3% | 66,7% |
| SRIS3 | 38,5% | 61,5% |
| SRIS4 | 53,8% | 46,2% |
| SRIS5 | 75% | 25% |
| SRIS6 | 54,5% | 45,5% |
| SRIS7 | 100% | 0% |

Table 2: Correlation of the SIRS_n scoring system with case outcome

Conclusions

This new model for predicting SRIS in horses with colic can be used with parameters that are easy to evaluate in field conditions and has a similar predictive efficiency to the previous model, with even best sensitivity.

