STEREOTYPIC BEHAVIOUR IN HORSES

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Introduction

In the broad sense, stereotypies are repetitive, relatively invariant actions. Stereotypies are considered abnormal when they occur without any primary function and might be detrimental to the health or performance of the animal (Mason, 1991).

The prevalence of the most common abnormal stereotypic behaviour (ASB) in horses, such as crib-biting/wind-sucking, wood-chewing, weaving, and box-walking have been reported in other studies at a level of 1-15% (Bachmann et al., 2003). Such stereotypies have been implicated as a possible cause for gastric ulceration and colic (Nicol et al., 2002; Archer et al., 2004) and for tooth wear, weight loss and weak condition (McBride and Long, 2001).

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1 Photo was taken by Manjula Dasi
Methods

Data collection

We performed a questionnaire survey to detect potential risk factors of ASB (cribbiting/wind-sucking, wood-chewing, weaving, and box-walking) on 287 horses by visiting 9 riding schools in Hungary. While the horse-owners or caretakers completed the questionnaire, we made direct observations on the horses checking for signs of ASB. The survey items focused on subject variables, housing, management conditions, food regime, stereotypies and problematic behaviour performed by the individual horse or by a horse in its visual contact.

Data analysis

Following a data-quality check, variables likely to be subject to recording bias and variables with a frequency more than 50% of missing values were excluded from further investigation. The remaining variables were classified as being recorded on a binary or an ordinary scale, and can be summarized as follows: Stereotypies were dependent variables in five separate models…

Statistical analysis

To determine which of the survey answers were the best predictors of the presence or absence of a stereotypic behaviour, first we performed a univariate analysis for the five stereotypic categories independently, using a single logistic mixed regression (Generalised Linear Mixed Models, GLMM) separately to all factors obtained from the questionnaire… All analysis was carried out using the R statistical software 2.2.0 (Ihaka and Gentleman 1996).
Results

Housing conditions and prevalence of behavioural disorders

Concerning all horses (N=287), the prevalence percentage of crib-biting/wind-sucking was 4.53 % (N=13), wood-chewing was 10.10 % (N=29), weaving was 2.79 % (N=8), and box-walking was 3.83 % (N=11). ... All horses but 6 individuals were non-thoroughbred, and the total number of horses in a yard were less than 60 in most cases.

Risk factors

Univariate GLMM statistics revealed 11 factors (presence of a weaving, or crib-biting, or box-walking or aggressive neighbour, performing aggression towards horses, receiving oats more than 2 times a day, more than two riders using the horse, performing box-walking, crib-biting, wood-chewing or door and tier opening behaviour) associated (P<0.10) with any of the four stereotypies (Table 2). Eight of those factors … The overall classification accuracy of the final models was 81-97 %. Each model classified horses without stereotypic behaviour more accurately (96 -100 %) than stereotypic horses (30 -65 %).

Table 2: Risk factors of stereotypies in the final multivariate models

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Risk factors</th>
<th>OR</th>
<th>CI at 95%</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crib-biting</td>
<td>presence of a weaving neighbour</td>
<td>20.81</td>
<td>1.74-315.12</td>
<td>0.018</td>
</tr>
<tr>
<td>/wind-sucking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood-chewing</td>
<td>receiving oats more than 2 times a day</td>
<td>24.82</td>
<td>2.66-231.47</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>box-walking</td>
<td>33.44</td>
<td>4.19-266.52</td>
<td>0.001</td>
</tr>
<tr>
<td>Stereotypies</td>
<td>presence of a stereotypic neighbour</td>
<td>10.14</td>
<td>2.22-46.29</td>
<td>0.003</td>
</tr>
<tr>
<td>in general</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>aggression towards horses</td>
<td>4.43</td>
<td>1.52-12.86</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>receiving oats more than 2 times a day</td>
<td>3.40</td>
<td>0.89-13.03</td>
<td>0.070</td>
</tr>
</tbody>
</table>
Discussion

Prevalence of abnormal stereotypic behaviour (ASB) in Hungarian riding schools was not different from those of other countries (McBride and Long, 2001; Christie et al., 2006). However, factors associated with ASB revealed by our analysis are in apparent contrast with previous epidemiological surveys. Management methods restricting natural behaviour have been suggested as major risk factors for developing ASB. … It is not surprising that many risk factors reported by others were not identified in our study, because management practices in the studied 9 riding schools were very similar and lacked most of the risk factors identified by previous studies, and other factors, like behaviour of the neighbouring horses, have not been included in previous surveys. Prevalence of abnormal stereotypic behaviour (ASB) in Hungarian riding schools was not different from those of other countries (McBride and Long, 2001; Christie et al., 2006). However, factors associated with ASB revealed by our analysis are in apparent contrast with previous epidemiological surveys. Management methods restricting natural behaviour have been suggested as major risk factors for developing ASB. … It is not surprising that many risk factors reported by others were not identified in our study, because management practices in the studied 9 riding schools were very similar and lacked most of the risk factors identified by previous studies, and other factors, like behaviour of the neighbouring horses, have not been included in previous surveys. …Careful monitoring of the horses for early signs of enhanced displacement behaviour is important to prevent the establishment of stereotypies. Horses susceptible to developing stereotypies might be moved away from stress agents, including stereotypic neighbours. 

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Summary

Revealing risk factors of abnormal stereotypic behaviour (ASB) in horses can help in the design of protective measures. Previous epidemiological studies indicate that social isolation, housing, management conditions and feeding regime have a strong effect on developing ASB. The common belief that exposure to a stereotypic horse increases the risk of ABS has never been substantiated. Here we report that a Generalised Linear Mixed Models (GLMM) analysis of data on 287 horses of 9 riding schools revealed that exposure to a stereotypic neighbour is a significant risk factor for performing stereotypy. Also, aggressive behaviour towards other horses increased the odds of stereotypy in the aggressor. These correspondences are unlikely to be a riding-school effect, because riding schools were treated as random factor in the GLMM. Risk factors identified by epidemiological studies cannot be treated as causal agents without independent evidence. Our aim in presenting these findings was to draw attention to the possibility of neighbour effects so that other researchers would include this variable in their surveys.
Acknowledgement

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References
