Effect of the Tellington Ttouch® Method on Horse Behaviour in Daily Practices

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Introduction

Taking care of animal means providing quality life conditions. Life quality is connected to the welfare which refers to the state of an animal in relation to its environment, and can be measured [1]. Often times it is assessed as being good or inadequate in consideration of different aspects of animal's life conditions. Animals have a wide range of needs to be met, and animal husbandry comprises of many functional systems that are made to sustain these needs. The indicators of deficient life conditions and thus inadequate welfare include the consequences of poorly met needs such as reduced life expectancy, impaired growth, body damage, disease, behavioural anomalies, etc. [2].

Horses have to be fed, given water and cleaned on a regular basis, and this daily care includes providing hoof care. Handlers are most frequently injured by horse kicks as most accidents happen when on leg (grooming, cleaning stables, etc.) [3]. Kicking is a normal part of the equid ethogram, used for defence. Incidents involving kicking lead to injuries ranging from mild contusions to death [4]. To ensure the sense of security during daily work practices in handler and in horse, confidence in a safe working practice and minimisation of injury risk have to be reached.

It was found that fear is the most important influential factor of horse-human injuries [4]. Different authors [5,6] believe that horses kick out of fear, mostly as a response to prior aggressive handling or as a reflex to touching the hind legs. It is assumed that their fear can be soothed by gentle touch and calm voice rather than by punishment [5]. Horse's fear can be measured by aggression or flight response and by increased heart rate. The expected frequency of horse heart rate is 30 - 50 beats per minute [7].

Traditional training methods and handling practices attempting to achieve the obedience and desired behaviour in horse since its domestication have presumably been developed in the lack of consideration of its welfare. These methods have based on different approaches, ranging from physical restraint and constraint to the conditioning techniques using the positive (food, rest, stroke, calm voice,...) and negative (physical discomfort, pain or fear) reinforcements or punishment. Reinforcements have been applied...
to encourage the desired behaviour by triggering horse's motivation. Positive reinforcement associates the desired behaviour with application of a positive stimulus, whereas a negative reinforcement is applied only until the horse performs the desired behaviour. Punishment on the other hand represents an action that stops or reduces the occurrence of undesired behaviour. In general, contemporary approaches used in work with horses are still founded upon traditional methods, based on application of negative reinforcements or punishment [6,8].

The Tellington TTouch® training method established by Linda Tellington-Jones, by contrast, in achieving the same working goal reportedly reduces any existing discomfort, stress and fear in horse, performing specific tactile stimulation that resembles allogrooming. The system of touches – circular pressuring movements of the hands and fingers over different body areas is intended, among other, to increase relaxation and reduce stress in performance horse by activating cellular function. The induced well-being in horse associated with positive stimulus leads to display of desired behavioural and ultimately positive welfare changes [8-10]. The described outcome of this method is supported by a general premise that the tactile stimulation results in a satisfaction and relax response [11]. For example, in a group of 10-month old calves treated with the Tellington TTouch® method during the first 4 weeks post partum, decreased blood cortisol level, lessened fear of humans and less frequent display of stress-related behaviour were observed at the abattoir compared to the control group [12].

The objective of this study was to examine the effect of the Tellington TTouch® method on the horse behaviour during hoof care. The goal was to reduce resistance to hoof care, change existing aggressive behaviour and enhance trust between a horse and human to enable safe work conditions during hoof care. Comparison of the behaviour during the hoof care performed in a customary, traditional manner, measuring time needed to complete the performance and horse's heart rate was made in an experiment designed as a group trial and a case study. In addition to the measurements, number of horse's attempts to withdraw a leg, and horses' optical communication were assessed.

Materials and Methods

Animals

In the group trial, six Lipizzan horses kept for pedagogic and research purposes by University of Ljubljana, Biotechnical Faculty were included. Among them were two young horses born in 2011, which spent the major part of the trial at the pasture. Others were working (school) horses, kept in stable and used for riding and driving; 3 geldings born in 2005 and 2009, and a filly born in 2009.

The case study included a privately owned warmblood crossbred filly born in 2010. It was showing unwanted behaviour in form of distrust toward new owner despite the absence of any related bad experience. It was expressing threats with the rearing and ears laid back when an attempt to approach was made. The problem became even more serious when the hoof care took place; it started kicking whenever its legs were touched. It showed the most sensitive reactions when touching its head, abdomen or the inner part of the hind legs. Its owner was bitten frequently despite of being careful.

Experimental design

Group trial: The trial lasted for 2 weeks in June and July 2013, 3 days a week. Each time the work with horses was carried out in the same order. During the first week horse behaviour throughout the hoof care was observed, performed in a manner horses were accustomed to (customary; traditional). During the second week horse behaviour was observed throughout the hoof care with the Tellington TTouch® method application prior to the work. The hoof care started at 9 am, after the morning feeding and cleaning the stable. The work was performed in the stable where horses were housed.

Horse's heart rate (beats/minute) was measured using the measuring device Polar RS800CX G5 Equine. The data were downloaded from the device to the computer by programme Polar Pro Trainer Equine Edition 5.

Each part of the experiment started with a preparation of the horse (haltering the horse; tethering it in its box and setting the Polar equipment on the horse). After that lifting of all four legs was started, beginning with the front left leg, than front right leg, hind left leg, and ending with the hind right leg. After the leg lift, the hoof was cleaned with a wedge, and a sledgehammer was used to simulate the horse shoeing.

The following parameters were measured or assessed:
• time needed from the moment of entering the stable to the moment of exiting the stable, and the time of hoof care for each leg that was performed in between (in seconds),
• number of horse's attempts to withdraw each leg,
• number of successful leg withdrawals,
• horse's heart rate (beats/minute),
• optical communication – body language (position of the ears, eyes, lips and position of the head), scaled from 1 – 5

Optical communication was assessed to determine horse's willingness to cooperate in the activity. 1 point was noted at presence of undesired (aggressive) behaviour, and 5 points were noted when remarkable cooperation with human was observed (Table 1).
Number of successful leg withdrawals was rarely observed regardless the method used. In the 6th week of experiment, the effort to gradually lift hind leg forward, toward front leg, was made. The leg was held in that position for 3 seconds and then slowly put back on the ground. In the 7th week the same action was conducted in addition to gentle circle movements performed with horse’s hind leg. In the 8th week the procedure remained the same and the attempt to clean the hooves was executed.

Tellington Ttouch® method

Under the name of ‘Tellington Ttouch® method’, Linda Tellington-Jones has developed more than 30 different Ttouches® for trust, awareness, health and performance [5]. In the study 3 Ttouches® were performed.

The method was applied under the guidance of Mrs. Darja Žnidaršič, Slovenian Tellington Ttouch® therapist and instructor, as the people applying the Ttouches® in the experiment have never performed it before.

Statistical Analyses

Data were analysed using the statistical software SAS/STAT 9.2 [13]. The difference between the customary and the Tellington Ttouch® method was estimated comparing Least Square Means (LSM) with t-test.

Results

Group trial

Results showed statistically significant higher time needed for front left leg hoof care (+ 8.72 s; p = 0.0294) during the Tellington Ttouch® method application, and significantly higher time needed for hind left hoof care leg (+ 11.56 s; p = 0.0026) when applying the customary method (Table 2).

Number of leg withdrawal attempts altogether and for separate legs differed significantly between the methods (p = 0.0001 – 0.0246), with exception of attempt to withdraw the hind right leg (Table 3). Generally, the numbers were higher during the customary method application (1.72 – 6.06) compared to the Tellington Ttouch® method (0.22 – 1.22). Difference estimate for each leg was around 1.5, and 4.83 for all legs.

Estimated middle values for horse’s heart rate for different method application, made with t - test were not statistically significant and varied from 38.56 to 42.17 beats per minute (Table 4).
<table>
<thead>
<tr>
<th>Variable (seconds)</th>
<th>Traditional method (LSM ± SEE)</th>
<th>‘Touch’ method (LSM ± SEE)</th>
<th>Difference estimate</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total time needed for hoof care</td>
<td>306.50 ± 15.54</td>
<td>316.17 ± 15.54</td>
<td>9.67 ± 11.10</td>
<td>0.3921</td>
</tr>
<tr>
<td>Time needed for front left leg</td>
<td>55.00 ± 4.18</td>
<td>63.72 ± 4.18</td>
<td>8.72 ± 3.77</td>
<td>0.0294</td>
</tr>
<tr>
<td>Time needed for front right leg</td>
<td>59.33 ± 4.93</td>
<td>60.88 ± 4.93</td>
<td>1.56 ± 6.06</td>
<td>0.7995</td>
</tr>
<tr>
<td>Time needed for hind left leg</td>
<td>61.39 ± 4.31</td>
<td>49.83 ± 4.31</td>
<td>11.56 ± 3.46</td>
<td>0.0026</td>
</tr>
<tr>
<td>Time needed for hind right leg</td>
<td>50.11 ± 4.12</td>
<td>47.67 ± 4.12</td>
<td>2.44 ± 5.83</td>
<td>0.6784</td>
</tr>
</tbody>
</table>

Table 2: Least square means and corresponding standard errors (LSM ± SE) for the time needed for hoof care when applying the traditional or the Tellington Ttouch® method

<table>
<thead>
<tr>
<th>Variable</th>
<th>Traditional method (LSM ± SEE)</th>
<th>‘Touch’ method (LSM ± SEE)</th>
<th>Difference estimate</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of attempts to withdraw legs</td>
<td>6.06 ± 1.32</td>
<td>1.22 ± 1.32</td>
<td>4.83 ± 0.91</td>
<td>0.0001</td>
</tr>
<tr>
<td>Number of attempts to withdraw front left leg</td>
<td>2.00 ± 0.64</td>
<td>0.44 ± 0.64</td>
<td>1.56 ± 0.65</td>
<td>0.0246</td>
</tr>
<tr>
<td>Number of attempts to withdraw front right leg</td>
<td>1.78 ± 0.43</td>
<td>0.28 ± 0.43</td>
<td>1.50 ± 0.41</td>
<td>0.0012</td>
</tr>
<tr>
<td>Number of attempts to withdraw hind left leg</td>
<td>1.72 ± 0.49</td>
<td>0.22 ± 0.49</td>
<td>1.50 ± 0.58</td>
<td>0.0163</td>
</tr>
<tr>
<td>Number of attempts to withdraw hind right leg</td>
<td>0.56 ± 0.19</td>
<td>0.28 ± 0.19</td>
<td>0.28 ± 0.22</td>
<td>0.2257</td>
</tr>
</tbody>
</table>

Table 3: Least square means and corresponding standard errors (LSM ± SE) for the number of leg withdrawal attempts

<table>
<thead>
<tr>
<th>Variable</th>
<th>Traditional method (LSM ± SEE)</th>
<th>‘Touch’ method (LSM ± SEE)</th>
<th>Difference estimate</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in the horse’s heart rate between methods</td>
<td>-4.94 ± 1.56</td>
<td>-6.05 ± 1.56</td>
<td>1.11 ± 1.98</td>
<td>0.5797</td>
</tr>
<tr>
<td>Horse’s heart rate - front left leg</td>
<td>39.5 ± 2.43</td>
<td>42.17 ± 2.43</td>
<td>2.67 ± 3.43</td>
<td>0.4444</td>
</tr>
<tr>
<td>Horse’s heart rate - front right leg</td>
<td>38.56 ± 1.13</td>
<td>41.67 ± 1.13</td>
<td>3.11 ± 1.57</td>
<td>0.0589</td>
</tr>
<tr>
<td>Horse’s heart rate - hind left leg</td>
<td>39.89 ± 0.89</td>
<td>42.11 ± 0.89</td>
<td>2.22 ± 1.22</td>
<td>0.0809</td>
</tr>
<tr>
<td>Horse’s heartbeat rate - hind right leg</td>
<td>39.78 ± 1.18</td>
<td>41.28 ± 1.18</td>
<td>1.50 ± 1.29</td>
<td>0.2581</td>
</tr>
</tbody>
</table>

Table 4: Least square means and corresponding standard errors (LSM ± SE) for horses’ heart rate

<table>
<thead>
<tr>
<th>Optical communication</th>
<th>Traditional method (LSM ± SEE)</th>
<th>‘Touch’ method (LSM ± SEE)</th>
<th>Difference estimate</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical communication</td>
<td>2.53 ± 0.23</td>
<td>3.28 ± 0.23</td>
<td>0.75 ± 0.14</td>
<td>0.0001</td>
</tr>
<tr>
<td>Optical communication - front left leg</td>
<td>2.31 ± 0.24</td>
<td>3.17 ± 0.24</td>
<td>0.86 ± 0.19</td>
<td>0.0002</td>
</tr>
<tr>
<td>Optical communication - front right leg</td>
<td>2.17 ± 0.20</td>
<td>3.31 ± 0.20</td>
<td>1.14 ± 0.21</td>
<td>0.0001</td>
</tr>
<tr>
<td>Optical communication - hind left leg</td>
<td>2.30 ± 0.27</td>
<td>3.11 ± 0.27</td>
<td>0.81 ± 0.20</td>
<td>0.0005</td>
</tr>
<tr>
<td>Optical communication - hind right leg</td>
<td>2.53 ± 0.22</td>
<td>3.03 ± 0.22</td>
<td>0.50 ± 0.21</td>
<td>0.0237</td>
</tr>
</tbody>
</table>

Table 5: Least square means and corresponding standard errors (LSM ± SE) for optical communication
Difference estimates for optical communication between the methods showed to be statistically significant ($p = 0.0001 - 0.0237$), and ranged from 0.5 to 1.14 points. Estimates of optical communication were equal to 2.17 points or higher for both methods, and generally higher for the Tellington Ttouch® method (Table 5).

**Case Study**

First three weeks of working with problematic horse no changes in behaviour were noted; the filly kept its ears flipped back.

Observable changes in horse's behaviour started in the 4th week of experiment; horse seemed more relaxed and its ears were placed straight more often. In that time, optical communication during the attempt to touch the hind legs was assessed by 1 point and heart rate measurement was 56 beats per minute.

After 8 weeks of the Tellington Ttouch® method application, horse's body language was assessed by 2 to 3 points. Ears were relaxed, lips were less compressed, and eyes were opened normally. Horse's average heart rate was 42.5 beats per minute. Estimated differences in optical communication and heart beat were statistically significant.

**Discussion**

**Group trial**

There were no significant differences estimated in the total time needed for hoof care between different method applications. The analysis confirmed significant differences only for both left legs, but no firm conclusion could be made based on the results. The attempt to withdraw a leg was noted rarely in the case of the Tellington Ttouch® method application. The biggest difference was estimated regarding the front left leg.

Horses' heart rate values were within the expected range all along the experimental period. There were no differences in the horse welfare between the methods applied, assessed by this parameter as a fear response. Being school horses, they were accustomed to greater exposure to human contact. In addition to having experiences with frequent use, that might influenced the results.

Body language assessments showed the horses were willing to cooperate with human and were not displaying any signs of unwanted behaviour throughout the duration of experimental period. They were relaxed and working with them was safe regardless of the method applied. Horses were assessed to show 33 - 66% willingness for cooperation (Table 1). Somewhat higher estimates for body language after Tellington Ttouch® method application are in agreement with belief that tactile stimulation improves the quality of relationship between horse and human [11].

**Case Study**

Estimates of optical communication increased from 4th to 8th week. After 8 weeks of using the Tellington Ttouch® method, the horse expressed stress-free relationship towards human. It was very relaxed and acceptable to the application of the Ttouches® along the whole body. The horse stopped kicking and calmly accepted the hoof care. The assessment of the body language showed increased willingness to cooperate.

During the hoof care horse's heart rate decreased; from a slightly elevated value, which indicated presence of fear in the horse, to the normal heart rate. Similar observation of a heart rate decrease in case of using the Tellington Ttouch® method (from 53.9 to 47.3 beats/minute) was recorded in horse during the trailer load [9]. Results indicate that the implementation of the Tellington Ttouch® method in daily work practises can enhance horse's welfare by improving horse-human relationship and thus the safety of work conditions. In a relaxed working circumstances the risk of injury due to the kicking out of fear decreases.

Filly's unwanted behaviour has shown to be a consequence of fear, which could have been assigned to the change of an owner and/or the separation from the mother. Horse's behaviour towards strangers can differ from the behaviour toward known person [14]. Application of the customary method did not bring the desired effect. Punishment and presence of unfamiliar persons only increased the level of fear expressed by the horse. Application of Ttouches® together with kind, attentive handling on the contrary brought positive results, even during hoof care. This outcome is in agreement with the statement that horse usually kicks out of fear or fear related bad experience, and that such reactions could be changed with persistent positive attitude towards horse rather than by punishment [5]. It is also consistent with the suggestion that improved relationship with horse can be developed by expressing a calm attitude and applying gentle touches [15].

**Conclusions**

In the trial including group of horses daily exposed to human contact, showing no problematic behaviour, having no previous bad experiences with people, and being considered to be safe to work with, no major differences in behaviour were noted as a consequence of the Tellington Ttouch® method application. No difference in willingness to accept leg lifting or hoof care was observed, compared to the application of customary method based on traditional practices of working with horses.

In the case study behavioural improvement of the problematic horse was evidenced. When the Tellington Ttouch® method was applied in the horse expressing signs of unwanted behaviour, the reduction of fear and hence the improvement of welfare was achieved. Horse accepted hind leg lifting and hoof care in a calmer manner.
As there was no other horse to compare with at that time, it cannot be firmly concluded that the improvement is the effect of the Tellington TTouch® method application. It might well be the result of an increased amount of time spent with the horse, new positive experience with human attention or horse's adaptation to the new owner and environment.

To better understand the effect of the Tellington TTouch® method, further research has to be conducted. Future studies should include bigger number of horses, different horse categories and/or examples of other routine work practices.

Acknowledgement

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References

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