Can we breathe easy about Brachycephalic Obstructive Airway Syndrome? Effects of severity on canine play, exercise and feeding behaviour

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Introduction
Brachycephalic Obstructive Airway Syndrome (BOAS) forms a continuum from mild to severe. It is most common in dogs with brachycephalic conformations and predisposes dogs to respiratory complications [1]. BOAS reportedly impacts canine welfare when severe [2], but little is known about its effects on key positive aspects of behaviour when less severe.

Aims
To understand at what BOAS severity does it impact dogs negatively and to what extent. We hypothesise that beyond certain severities, BOAS will:
- reduce ability to exercise and haemoglobin oxygenation following walking,
- reduce playfulness,
- reduce appetite & increase difficulty eating, and
- disrupt sleep.

Materials and methods
Four welfare domains were investigated via an online owner questionnaire (2265 dogs) & direct observation (47 dogs): (1) Exercise, (2) Play, (3) Appetite, and (4) Sleep. Brachycephalic dogs ranging from unaffected to severe were included. Severity was quantified via a validated owner reported breathing (ORB) score [3].

Results
In the questionnaire, as BOAS severity increased, overall quality of life and most aspects of the four domains (exercise, play, appetite & sleep) became more impaired, especially with scores ≥15 (Fig. 2-5; Table 1). Little reached statistical significance in the direct observations, but observed respiratory noise (stertor and stridor) increased with severity in all domains tested (Fig 6a-c).

Conclusions
- There is a gradual decrease of activities within the 4 welfare domains that dogs with increasing ORB scores are able to do [4].
- The collective results had indicated that mild BOAS (~8-14 ORB score) has less effect on canine welfare than sometimes assumed.
- The stage of BOAS which negatively impacts canine lifestyle occurs for dogs with moderate BOAS (~15-25 ORB score) which begin to be restricted on at least 2 out of 4 welfare domains.
- Severe cases of BOAS (~26-40 ORB score) indicate a significant reduction in the ability to perform everyday functions across all the domains investigated.

Summary
Dogs with BOAS can suffer breathing difficulty during physical activity and excitement, so part of their management involves avoiding such situations. However the lack of activities a dog may be able to do denotes a reduced quality of life that largely impacts dogs from moderate to severe BOAS cases.

The results can help owners, breeders and vets decide at what point appropriate treatment is required to maximise welfare in BOAS affected dogs.

Table 1: Average Quality of Life reports by owners from the questionnaire arranged by ORB scores.

<table>
<thead>
<tr>
<th>QoL</th>
<th>ORB Score</th>
<th>BOAS Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>6</td>
<td>None</td>
</tr>
<tr>
<td>Good</td>
<td>9</td>
<td>Mild</td>
</tr>
<tr>
<td>Moderate</td>
<td>17.5</td>
<td>Moderate</td>
</tr>
<tr>
<td>Bad</td>
<td>25</td>
<td>Severe</td>
</tr>
<tr>
<td>Very Bad</td>
<td>35</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Further information
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Literature cited