Investigation of values of some clinically important blood parameters in Van cats

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ABSTRACT

Objectives: In this study, normal values of important blood parameters in the clinical direction of blood samples of Van cats living in Van and around Van were investigated.

Results: The aim of this study was to investigate the effect of glucose, total cholesterol, total lipid, total protein, total bilirubine, urea, creatinine quantities, α-Amylase, GOT, GPT, γGT, CK, ALP, LDH, α-HBDH, Che, SDH enzyme activities, GOT/GPT, γGT/GOT, CK/GOT, LDH/GOT, HBDH/LDH ratios and serum protein fractions in 10 Van cats; albumin, α₁-globulin, α₂-globulin, β-globulin, γ-globulin and albumin/globulin ratio were determined.

Conclusion: In order for Van cats that are an important cultural asset and protected rather not to become extinct but to provide them with healthy conditions for living and breeding, we believe that the values we identify will contribute to practice associated with Van cats and generate collective reference values in scientific studies and will help veterinary clinicians.

Keywords: Biochemical parameters, cat, Van cats.

INTRODUCTION

In veterinary medicine, quantitative biochemical blood analysis is essential for disease control and precise diagnosis. In the diagnosis of various diseases, the prognosis and the control of the treatments, the clinician will refer to the source of biochemical data in case of doubt. The use of clinical biochemical investigations in internal diseases, particularly in suspicious cases, is essential to establish a definitive diagnosis and to control treatment.

We all know cute little cute Van cats. History of Van cats: The homeland is the homeland of Van. Turkey is a pure cat who grew up in Turkey. In 1969, pure blood was regarded as a blood sick. Compared to other cat breeds, it is a natural cat. The spread of Van cats to the world: It was first taken to England by an English couple and produced there. (Fawcett, 2018)

The homeland of the Van cat, which has several and important characteristics compared to other breeds, is Buhtamara, Altai Mts. It is a medium-long-haired cat confined to Van, Turkey. It is also known as the odd-eyed cat in the region, that means it has one blue and one orange eye, white patches are scattered on its head, legs and tail (Odabasioglu and Ates, 2000).

Genetically, the breed has three eye colors blue, yellow, and green and they are frequently mismatched, giving Turkish Van cats that coveted David Bowie effect. These strange kitties evolved around Lake Van,
so they are predisposed to swimming. Modern Turkish
Van cats probably won’t leap into a random lake. But
they just might jump into your pool. They’re
frighteningly good jumpers. Due to their large paws
and strong musculature, Turkish Van cats can hop
from your kitchen floor to the top of your fridge
without thinking twice. They love to swim. These
strange kitties evolved around Lake Van, so they are
predisposed to swimming (Pomranz 2018).

The work of Van cats, which are an important cultural
heritage and are under protection, has not been
depleted, healthy survival and production have gained
importance in recent years. We believe that the
clinical biochemical parameters that we have
identified will be vital for veterinarians, and that Van
cats will collectively establish reference values in
practice and scientific studies.

In this study, the blood of the Van cats in the blood of
fasting (glucose), GPT (glutamate-pyruvate
transaminase), GOT (glutamate-oxalacetate
transaminase), CK (creatinine kinase), ALP (Alkaline
phosphatase), Che (Choline esterase), SDH (sorbitol
dehydrogenase), α-HBDH (α-hydroxybutyrate
dehydrogenase), LDH (lactate dehydrogenase), γ-GT
(glutamyl transpeptidase) enzyme activities, total
protein, total bilirubin, total lipid, total cholesterol,
urea, creatinine quantities and serum protein fractions;
It was aimed to determine albumin/globulin ratio and
albumin, α-1 globulin, α-2 globulin, β-globulin and γ-
globulin values.

MATERIALS AND METHODS

In the study, 20 healthy individuals with good
nutritional and hygiene conditions and two healthy
eyes with different colors were found in the center of
Van and in the central villages (Yeşilsu, Atmaca,
Otluca villagers) blood sera taken from the so-called
single-eye cats were used.

Blood samples were duly taken from vena cephalica
antebrachii via Gr. 0.80x78 mm cannulas (Kraft and
Dürr, 1985).

Test kits were tested with the control serum
(Precinormi, Cat No. 171735, Boehringer-Mannheim)
and the results were complete. After the sera are
separated from the blood, the enzyme activities of
SDH, α-amylase, GPT (glutamate-pyruvate
transaminase), GOT (glutamate-oxalacetate
transaminase), CK (creatinine kinase), ALP (Alkaline
phosphatase), Che (Choline esterase), SDH
dehydrogenase) α- HBDH (alpha-hydroxybutyrate
dehydrogenase), LDH (lactate dehydrogenase), γ-GT
(glutamyl transpeptidase) were executed on the same
day. The following day total lipid, total cholesterol,
total protein, total bilirubin, creatinine, and urea were
measured with a photometer from Boehringer-
Mannheim. Blood sugar determination was done at the
same time with the Refloulux S instrument as the blood
was taken. Serum was also stored in sera (-21 C) for
protein electrophoresis. The serum obtained from
Beckman Company was made using the protein
electrophoresis kit (Cat No: 655900) (Paragon 1992).
The drying gel was assessed at 600 nm in
Densitometer.

RESULTS

The results are summarized in Table 1 and 2.

<table>
<thead>
<tr>
<th>Blood parameters</th>
<th>n</th>
<th>X</th>
<th>Sx</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-Amylase U/L</td>
<td>20</td>
<td>991.80</td>
<td>±86.7</td>
<td>270</td>
<td>1552</td>
</tr>
<tr>
<td>GPT, U/L</td>
<td>20</td>
<td>19.72</td>
<td>±4.0</td>
<td>8</td>
<td>72</td>
</tr>
<tr>
<td>GOT, U/L</td>
<td>20</td>
<td>18.65</td>
<td>±14</td>
<td>9</td>
<td>59</td>
</tr>
<tr>
<td>CK, U/L</td>
<td>20</td>
<td>99</td>
<td>±13.6</td>
<td>18</td>
<td>161</td>
</tr>
<tr>
<td>ALP, U/L</td>
<td>20</td>
<td>51.05</td>
<td>±6.39</td>
<td>11.5</td>
<td>82</td>
</tr>
<tr>
<td>CHE, U/L</td>
<td>20</td>
<td>997.7</td>
<td>±164</td>
<td>474</td>
<td>3060</td>
</tr>
<tr>
<td>SDH, U/L</td>
<td>20</td>
<td>4.3</td>
<td>±0.85</td>
<td>1.6</td>
<td>12.8</td>
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<tr>
<td>α-HBDH, U/L</td>
<td>20</td>
<td>92.9</td>
<td>±9.20</td>
<td>49</td>
<td>164</td>
</tr>
<tr>
<td>LDH, U/L</td>
<td>20</td>
<td>221.2</td>
<td>±40.9</td>
<td>96</td>
<td>258</td>
</tr>
<tr>
<td>γGT, U/L</td>
<td>20</td>
<td>5.85</td>
<td>±0.35</td>
<td>3.0</td>
<td>8.4</td>
</tr>
<tr>
<td>Glucose, mg/dl</td>
<td>20</td>
<td>84.4</td>
<td>±4.89</td>
<td>44</td>
<td>143</td>
</tr>
<tr>
<td>Total protein, g/dl</td>
<td>20</td>
<td>7.99</td>
<td>±4.07</td>
<td>1.63</td>
<td>14.0</td>
</tr>
<tr>
<td>Total bilirubin, mg/dl</td>
<td>20</td>
<td>0.29</td>
<td>±0.006</td>
<td>0.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Total lipid, mg/dl</td>
<td>20</td>
<td>385</td>
<td>±61.3</td>
<td>54</td>
<td>989</td>
</tr>
<tr>
<td>Total cholesterol, mg/dl</td>
<td>20</td>
<td>79.4</td>
<td>±5.1</td>
<td>42.6</td>
<td>120</td>
</tr>
<tr>
<td>Urea, mg/dl</td>
<td>20</td>
<td>32.3</td>
<td>±4.1</td>
<td>11.1</td>
<td>82</td>
</tr>
<tr>
<td>Creatinine, mg/dl</td>
<td>20</td>
<td>1.7</td>
<td>±0.22</td>
<td>0.4</td>
<td>3.3</td>
</tr>
<tr>
<td>Albumin, g/dl</td>
<td>20</td>
<td>4.74</td>
<td>±0.077</td>
<td>2.53</td>
<td>8.47</td>
</tr>
<tr>
<td>Globulin, g/dl</td>
<td>20</td>
<td>3.96</td>
<td>±0.97</td>
<td>2.62</td>
<td>5.47</td>
</tr>
</tbody>
</table>

Table 1. Biochemical parameters detected in blood and sera of Van cats.
**DISCUSSION**

Turkish Van cats have a middle-size head. There are one or two black points between ears of kittens. Most of the kittens having two or more black spots are odd eye and these black spots are defined almost as stamp of odd eye cats. They are active animals that like to play with water. Cats have three types of hair length as long, medium and short hair. One of the properties that make Van cats attractive is the color of their eyes. They could either have color blue and amber on both eyes, or one blue and one amber eye (odd-eyed) (Ates, 2000, Odabasoglu and Ates, 2000, Marcus, 2009). They have semi-long with a cashmere-like texture, and soft to the roots with no trace of undercoat. Due to the extremes in climate of their native region, the breed carries two distinctive coat lengths and allowances must be made for the seasonal coat. The summer coat is short, conveying the appearance of a short hair; the winter coat is substantially longer and thicker. There is feathering on the ears, legs, feet and belly. Facial fur is short. A frontal neck ruff and full brush tail become more pronounced with age. The above description is that of an adult, allowances must be made for short coats and tail hair on kittens and young adults (Marcus, 2009, Çak, 2017).

As a result, consideration of changes in hematological parameters during the growth of Van cat kittens, will be important in improving the diagnosis of disease and treatment procedures. In addition, following the birth of a routine check on a monthly basis may change these hematological parameters. We conclude that would be useful to our colleague veterinarians whose will follow.

As for the susceptibility, prognosis, and treatment of various diseases and controls, the clinician's source of reference is biochemical data in case of doubt.

Organ specific enzymes, which are quite accurate in recognizing specific organ damages, are considered as indicator enzymes. There are enzymes that play an important role especially in the differential diagnosis of liver diseases (Benjamin, 1978, Imren and Turan, 1985).

While the α-amylase activity was 991.8+8.7 IU in the study, the normal activity amongst the cats in the literature was reported as 371-1800 IU (Kraft, 1984, Reflotron, 1989, The Merc, 1991). Serum GPT and GOT activities were 19.72±4.0 IU and 18.63±3.14, respectively, whereas GPT activity was reported as 1.7-72 IU and GOT activity 6.7-104 IU according to literature data.

While serum ALP activity was 51.05±6.39 IU in Van cats, ALP activity in cats was given as 0-77 IU in related literature results. The SDH activity in Van cats was 4.3±0.85 IU, whereas in the literature, SDH activity was reported as 1-7.7 IU in cats. Che activity in Van cats was 997.7±164 IU, whereas in the literature, it was reported as 1000-3000 IU (Kraft, 1984).

LDH activity was measured as 221.2+40.9 IU and α-HBDDH activity was 92.9+9.20 IU in Van cats and LDH activity was reported as 35.1-224.9 IU and α-HBDDH as 86.3-95.8% of the LDH activity amongst other cats according to the literature data (Benjamin, 1978, Kraft, 1984, Schechter et al., 1973, Salle et al., 1990, The Merc, 1991).

Among Van cats, CK activity was 99+13.6 IU, γ-GT activity was 5.85±0.35 IU while values in other cats were reported as 0-195 IU for CK and 1.8-12 IU for γ-GT (Kraft, 1984, The Merc, 1991).

In the study, the level of blood glucose in Van cats was 84.4±4.89 mg/dl. According to the literature data, blood glucose level was reported as 70.8-136 mg/dl for cats (Reflotron, 1989, Kraft, 1984, Schechter et al., 1973).

Serum total protein level was 7.99±4.07 g/dl, albumin level was 4.74±1.76 g/dl, and globulin level was 3.96±0.97 g/dl in Van cats. Compared to the literature data, serum total protein level is 5.5-8.0 g/dl, albumin level is 2.45-3.75 g/dl and globulin level is 2.44-4.70 g/dl for cats (Kraft, 1984, Kraft and Dürr, 1985). While in this study for Van cats, bilirubin level was 0.29±0.006 mg/100 ml; urea level was 32.3±4.1 mg/100 ml; creatinine level was 1.7±0.22 mg/100 ml, data results for other cats indicate as follows: bilirubin level 0.2-0.5 mg/dl, urea level 15.4-82 mg/100 ml, creatinine level 0.5-1.9 mg/100 ml (Reflotron, 1989, Kraft, 1984, Kraft and Dürr, 1985, The Merc, 1991).

Serum total lipid level was found to be 376±110

<table>
<thead>
<tr>
<th>Serum proteins</th>
<th>n</th>
<th>X</th>
<th>Sx</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin g/dl</td>
<td>10</td>
<td>4.74</td>
<td>±1.76</td>
<td>2.53</td>
<td>8.47</td>
</tr>
<tr>
<td>α-1 Globulin g/dl</td>
<td>10</td>
<td>0.25</td>
<td>±0.077</td>
<td>0.11</td>
<td>0.35</td>
</tr>
<tr>
<td>α-2 Globulin g/dl</td>
<td>10</td>
<td>1.24</td>
<td>±0.24</td>
<td>0.88</td>
<td>1.76</td>
</tr>
<tr>
<td>β-Globulin g/dl</td>
<td>10</td>
<td>0.79</td>
<td>±0.30</td>
<td>0.48</td>
<td>1.4</td>
</tr>
<tr>
<td>γ-Globulin g/dl</td>
<td>10</td>
<td>1.67</td>
<td>±0.68</td>
<td>0.79</td>
<td>2.79</td>
</tr>
</tbody>
</table>

Table 2. Serum protein values of Van cats.
mmg/100ml and total cholesterol level was found to be 70-161 mg/dl for cats in the literature data; however, serum total lipid level was found to be 385+61.3 mg/100 ml and total cholesterol level was 79.4+5.1 mg/100 ml. (Reflotron, 1989, The Merc, 1991).

In order for Van cats that are an important cultural asset and protected rather not to become extinct but to provide them with healthy conditions for living and breeding, we believe that the values we identify will contribute to practice associated with Van cats and generate collective reference values in scientific studies and will help veterinary clinicians.

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