

HEPATIC INSUFFICIENCY IN DOGS AND ITS HERBAL TREATMENT

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Hepatopathy or hepatic insufficiency is a very common problem in dogs due to ingestion of some chemicals, drugs like paracetamol, furosemide etc., toxins and infectious agents. Since liver plays the very vital role for normal metabolic functions of carbohydrate, protein and fats, synthesis of plasma proteins, erythropoiesis and detoxification etc., hepatic dysfunctions leads in inappetence, weight loss, anaemia and ascites etc. For treatment, other than some allopathic treatments available, some herbal hepatonics have also claimed effective. Meboliv, a herbal product has been selected for the study.

Materials and Methods

In this study, the clinical cases of dogs suspected to be suffering from hepatic insufficiency and which were brought to the Clinics under WBUAFS with symptoms of anorexia, weight loss, chronic constipation or diarrhoea, jaundice, anaemia and ascites etc. alone or in combinations were selected. A total of 12 nos. of dogs of both sexes of different breeds and between 2 to 8 years of age were screened. They were divided in 2 groups comprising 6 in each. One group (Gr-II) was kept as untreated control while the dogs of Gr-III were treated with Meboliv @ 5 to 10 ml twice daily orally before meal for 15 days. Another 6 healthy dogs brought to the Clinics for vaccination were selected as healthy control group or Gr-I. The blood samples from each dog were collected on 0,5,10,15 & 20th days of the experiment for different haematological, biochemical and enzymatic analysis using standard techniques.

Results & Discussions

The Clinical signs observed were anorexia, weight loss, diarrhoea, constipation & anaemia etc. are in conformity with the observations of Crawford *et.al* (1985) and Chapman *et. al* (1993) showed gradual improvements after treatment with Meboliv. The results of the haematological changes of the dogs in different groups are presented in table-1. The table shows that the mean haemoglobin (Hb) values on 0 day declined significantly ($P<0.05$) in Gr-II & Gr-III than Gr-I, the healthy dogs and following treatment in Gr-III, it improved significantly ($P<0.05$) to 12.15 gm% on 20th day though no improvement was noted in Gr-II.

Similarly the Total erythrocytic count (TEC) and PCV values were found significantly ($P<0.05$) lower on 0 day in both Gr-II & III than in Gr-I, but thereafter the values significantly ($P<0.05$) improved from 15th day onwards and became normal on 20th day though no change was recorded in Gr-II.

Table-1. Haematological values of different groups of clinical cases of hepatopathy in dogs.

| Parameters | Groups | Before treatment | After treatment | | | |
|----------------------------------|--------|--------------------|---------------------|----------------------|----------------------|----------------------|
| | | 0 day | 5 th day | 10 th day | 15 th day | 20 th day |
| Hb (gm%) | Gr.I | 12.44 ^a | 12.35 ^a | 12.41 ^a | 12.36 ^a | 12.48 ^a |
| | Gr.II | 8.94 ^b | 9.05 ^b | 9.17 ^b | 9.38 ^b | 10.05 ^b |
| | Gr.III | 8.65 ^b | 9.23 ^b | 9.91 ^b | 10.92 ^{ab+} | 12.15 ^{a+} |
| TEC (million/mm ³) | Gr.I | 7.90 ^a | 7.85 ^a | 7.92 ^a | 7.99 ^a | 7.88 ^a |
| | Gr.II | 4.51 ^b | 4.59 ^b | 4.69 ^c | 4.98 ^b | 5.46 ^b |
| | Gr.III | 4.69 ^b | 5.15 ^b | 6.31 ^{b+} | 7.32 ^{a+} | 7.76 ^{a+} |
| PCV (%) | Gr.I | 34.33 ^a | 34.67 ^a | 34.17 ^a | 33.00 ^a | 34.50 ^a |
| | Gr.II | 25.17 ^b | 23.67 ^b | 24.83 ^c | 26.83 ^b | 28.52 ^b |
| | Gr.III | 22.83 ^b | 25.00 ^b | 29.17 ^{b+} | 34.83 ^{a+} | 37.33 ^{a+} |
| TLC (thousands/mm ³) | Gr.I | 12.88 ^b | 12.77 ^b | 12.96 ^b | 13.04 ^b | 12.85 ^b |
| | Gr.II | 15.95 ^a | 15.85 ^a | 15.69 ^a | 15.15 ^a | 14.82 ^a |
| | Gr.III | 16.13 ^a | 15.12 ^{ab} | 14.14 ^{ab} | 13.41 ^{ab+} | 12.92 ^{b+} |

Values bearing at least one common superscript within the same column do not differ significantly ($P>0.05$).

+ Significant at 5% level ($P<0.05$) in comparison to its lowest value in the same group.

Table-2. Serum biochemical values of different groups of the clinical cases of hepatopathy in dogs

| Parameters | Groups | Before treatment | After treatment | | | |
|-------------------------|--------|--------------------|---------------------|----------------------|----------------------|----------------------|
| | | 0 day | 5 th day | 10 th day | 15 th day | 20 th day |
| Serum Glucose (mg/dl) | Gr.I | 79.93 ^a | 80.42 ^a | 78.98 ^a | 77.18 ^a | 79.59 ^a |
| | Gr.II | 58.84 ^b | 59.35 ^b | 60.28 ^b | 63.59 ^b | 66.31 ^b |
| | Gr.III | 58.29 ^b | 63.53 ^b | 71.12 ^{a+} | 75.89 ^{a+} | 78.89 ^{a+} |
| Total Bilirubin (mg/dl) | Gr.I | 0.44 ^b | 0.41 ^b | 0.45 ^b | 0.40 ^b | 0.43 ^b |
| | Gr.II | 1.22 ^a | 1.15 ^a | 1.02 ^a | 0.91 ^a | 0.78 ^a |
| | Gr.III | 1.26 ^a | 1.14 ^a | 0.88 ^a | 0.67 ^{ab+} | 0.49 ^{b+} |
| Total Protein (gm/dl) | Gr.I | 6.87 ^a | 6.94 ^a | 6.98 ^a | 6.88 ^a | 6.82 ^a |
| | Gr.II | 4.96 ^b | 5.14 ^b | 5.35 ^b | 5.61 ^b | 5.96 ^{b+} |
| | Gr.III | 4.88 ^b | 5.23 ^b | 5.94 ^{b+} | 6.55 ^{a+} | 6.89 ^{a+} |
| Albumin (gm/dl) | Gr.I | 3.01 ^a | 3.02 ^a | 3.07 ^a | 3.02 ^a | 3.01 ^a |
| | Gr.II | 1.90 ^b | 2.01 ^b | 2.14 ^b | 2.30 ^b | 2.50 ^{b+} |
| | Gr.III | 1.83 ^b | 2.06 ^b | 2.48 ^{b+} | 2.84 ^{a+} | 3.04 ^{a+} |
| Albumin Globulin ratio | Gr.I | 0.78 ^a | 0.77 ^a | 0.79 ^a | 0.78 ^a | 0.79 |
| | Gr.II | 0.62 ^b | 0.64 ^b | 0.66 ^b | 0.69 ^b | 0.72 |
| | Gr.III | 0.61 ^b | 0.66 ^b | 0.73 ^{ab+} | 0.77 ^{a+} | 0.79 ⁺ |

Values bearing at least one common superscript within the same column do not differ significantly (P>0.05).

+ Significant at 5% level (P<0.05) in comparison to its lowest value in the same group.

The significantly lower values of Hb, TEC and PCV as recorded on 0 day in the clinical cases of Gr- II & III were probably due to inability of the hepatic parenchymatous cells to produce erythropoietinogen and also partly due to reduced food uptake (Deepa,2001) as well as abnormality in the lipid composition of red cell membranes resulting from the abnormal hepatic lipid metabolism (Kelly,1993) in hepatopathy. Following therapy with Meboliv, the herbal hepatotonic, the hepatic functions were stimulated, which helped to decrease the cell destructions, increased adequate cell production and ultimately helped to increase the Hb, TEC and PCV values simulating with the observations of Dwivedi and Sharma(1989) in dogs and Pradhan(2001) in calves who also treated with some herbal preparations in hepatic disorders.

Andrographis paniculata, one ingredient of Meboliv is a cholagogue and is effective in sluggish liver (Nadkarni 1976), increases the biliary flow and liver weight and is effective in protecting liver damage (Dwivedi and Sharma, 1989). *Eclipta alba*, the other ingredient is antihepatotoxic (Mehra and Handa, 1968) while the other ingredients, *Phyllanthus niruri* is an excellent remedy for jaundice and *Boerhavia diffusa* is useful

against liver damage and anaemia as opined by Kirtikar & Basu(1975).

Kirtikar and Basu (1975), also opined, the other ingredients of Meboliv like *Citrus colocynthis*, *Terminalia chebula* and *Terminalia arjuna* are effective in correcting jaundice, constipation and anaemia due to liver disorders. They also opined *Fumaria parviflora*, *Azadirachta indica*, *Tephrosia purpurea* and *Mangifera indica* the other ingredients of Meboliv also cures the diseases of liver, improves appetite, decreases inflammations and removes the blood impurities,

The table-I also shows that the Total leukocyte count (TLC) recorded on 0 day was found significantly (P<0.05) elevated in both Gr-II and Gr-III than Gr- I and this leukocytosis is might be due to stress reactions in hepatopathy (Kelly, 1993), but after treatment it declined significantly (P<0.05) in Gr-III, when no change was recorded in Gr-II indicating repairing of inflammations and correction of hepatopathy with treatment of Meboliv.

The serum biochemical observations in different groups have been presented in table-2, also shows there is significant(P<0.05) decrease of the mean serum glucose levels in the clinical cases of dogs of Gr-II & III as

compared to the healthy control dogs on 0 day and it is probably due to inability of the hepatocytes to convert glycogen into glucose (Sharma *et al* (1986). But following therapy with Meboliv in Gr- III, a significant (P<0.05) increase of glucose values were observed from 10th day onwards and confirming the efficacy of herbal ingredients which stimulated the carbohydrate metabolism and helped in increasing the serum glucose levels.

The table-2 also shows that there is significant (P<0.05) higher values of total bilirubin in the affected dogs of Gr- II & Gr-III as compared to Gr-I and it might be due to poor excretion of bilirubin by hepatic parenchyma (Sharma *et al* .1993). However following therapy with Meboliv, the bilirubin levels decreased significantly (P<0.05) from 15th day onwards in Gr- III indicating reduction of intrahepatic congestion and relieving of

cholestasis which helped to increase the biliary flow.

The changes of Serum Total protein, Albumin and A/G ratios have also been presented in table-2. The table shows there was significant (P<0.05) declinations of these values on 0 day in both Gr-II & III as compared to the healthy dogs of Gr-I and it might be due to decreased feed intake (Berryman & Bollman,1943) and less plasma protein synthesis in the liver (Mullen, 1976). But following treatment with Meboliv, there were gradual improvements of these values in the subsequent observations in Gr-III indicating quicker regeneration of hepatic parenchyma when only mild changes were noted in the untreated group (Gr- II) and simulated with the observations of Pandey *et.al* (1985) who treated the dogs with other herbal hepatonic.

Table-3. Serum enzymatic values of different groups of clinical cases of hepatopathy in dogs.

| Parameters | Groups | Before treatment | After treatment | | | |
|------------|--------|---------------------|---------------------|----------------------|----------------------|----------------------|
| | | 0 day | 5 th day | 10 th day | 15 th day | 20 th day |
| ALT (IU/L) | Gr.I | 24.33 ^b | 26.60 ^b | 23.83 ^c | 25.33 ^b | 24.50 ^b |
| | Gr.II | 160.83 ^a | 160.87 ^a | 147.83 ^a | 137.67 ^a | 127.02 ^a |
| | Gr.III | 164.33 ^a | 137.33 ^a | 80.33 ^{b+} | 38.33 ^{b+} | 31.03 ^{b+} |
| AST (IU/L) | Gr.I | 23.83 ^b | 23.33 ^b | 22.50 ^c | 25.00 ^b | 24.33 ^b |
| | Gr.II | 141.17 ^a | 137.00 ^a | 116.33 ^a | 94.50 ^{a+} | 79.17 ^{a+} |
| | Gr.III | 133.69 ^a | 97.67 ^a | 63.17 ^b | 38.00 ^{b+} | 23.50 ^{b+} |
| GGT (IU/L) | Gr.I | 6.21 ^b | 6.20 ^b | 6.19 ^b | 6.21 ^b | 6.20 ^b |
| | Gr.II | 14.48 ^a | 13.55 ^a | 12.12 ^a | 11.24 ^a | 10.56 ^a |
| | Gr.III | 14.39 ^a | 12.86 ^a | 10.12 ^{ab} | 8.72 ^{b+} | 7.06 ^{b+} |

Values bearing at least one common superscript within the same column do not differ significantly (P>0.05).

+ Significant at 5% level (P<0.05) in comparison to its lowest value in the same group.

The observations of the serum enzymatic values in different groups have been presented in table-3 which shows, the mean values of Alanine amino transferase (ALT), Aspartate aminotransferase (ALT), and Gamma glutamyl transferase (GGT) increased significantly (P<0.05) on 0 day in the clinical groups i.e. Gr- II &- III in comparison to the healthy dogs (Gr-I) and probably due to leakage of the enzymes from the damaged hepatic cells (Hill and Kelly, 1974). However with treatment of herbal hepatonic Meboliv, the enzymatic mean values gradually declined and became almost normal at the end of the experiment when mild improvement was noted in Gr-II indicating hepatostimulant effect of Meboliv which helped to reduce the

hepatocytic damage as well as leakage of these enzymes.

On the basis of above findings, Meboliv the herbal hepatotonic was found effective in treatment of hepatopathy in Dogs.

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