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CLINICAL MANAGEMENT OF GEOPHAGIA IN A SUB-ADULT MALE ASIATIC ELEPHANT (*ELEPHAS MAXIMUS*) IN KAPILASH ZOO, ODISHA, INDIA

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ABSTRACT

A12 year old male Asiatic elephant (*Elephas maximus*) was diagnosed with a behavioral dealignment of geophagia with anorexia and constipation. Blood parameters showed decrease in the hemoglobin level, while the AST, ALT values were found to be higher indicating affection to the liver. Treatment included were Tribivet Inj., Belamyl Inj., T-Phos Inj., Intacal-IM Inj intramuscularly and Ecotas bolus orally was given for a period of about 15 days. Following treatment after 15 days, the hemoglobin level in the blood improved, while the AST and ALT values came down to normal range. The appetite of the elephant improved, and no clinical signs of geophagia was being observed.

KEYWORDS: Geophagia, anorexia, *Elephas maximus*, AST, ALT, affection.

INTRODUCTION

A12 year old male Asiatic elephant (*Elephas maximus*) named “Kartik” of Kapilash Zoo presented signs of anorexia, geophagia and slight constipation. The mucous membrane was found to be slightly pale. Geophagia is a problem generally associated with liver disorders *(Prasad S. A. et.al*). Haemato-biochemical parameters are indicators of several kinds of disease in elephants (*Allwin.et.al*.). In recent times, studies were performed to identify clinical and laboratory variables that could be used to predict the survival chances of the

affected elephants (*Moore, 2006).* In this backdrop, the present study is planned to evaluate the usefulness of commonly assessed clinical and laboratory parameters for proper diagnosis of several diseases in elephants (*Allwin.et.al.).* Haemato-biochemical parameters play an important role in advance diagnosing of several diseases (*Veersalvam.M. et. al.).* However, meagre reports has been isolated from available literature citing the problems associated with geophagia and the concurrent liver problems in Asiatic elephants. Considering, the importance of this topic and the persual of available literature, the study has been planned to create a baseline regarding the clinical management of higher haemato-biochemical values and its association with geophagia.

MATERIALS AND METHODS

The age of the elephant in the study was 12 years, exhibiting signs of geophagia. During sampling, the elephant was positioned in dorso-ventral sitting position with the help of caretakers. Prior to collection of blood, the area was cleaned with spirit alcohol. The blood was collected from the ear vein into EDTA and Clot activator vials. The blood smears were prepared for white blood cell differential count and blood parasitic screening. For further accurate results DLC was done using manual method using giemsa stain as maintained below.

DIFFERENTIAL LEUCOCYTE COUNT BEFORE AND AFTER TREATMENT

Method for Differential leucocyte count from whole blood using giemsa stain

Procedure of Giemsa staining.

1. First, of all prepare a thin blood smear in a clean glass side and air dry it.
2. Now, cover the well-dried, thin blood smear with undiluted Giemsa stain solution by counting the drops of Giemsa stain.
3. Let, it stand for 2 minutes, the methanol present in the stain fixes the smear onto the glass slide.
4. After 2 minutes, add twice the amount of distilled water or Phosphate buffer solution and mix the content by swirling or by blowing gently. Incubate the slides for atleast 10 min at 37^{o}C. This will stain the blood cells.
5. Rinse the slides thoroughly with Phosphate buffer solution up to 2 minutes or until it acquires a purple-pinkish tinge.
6. Air dry the slides in a tilted position so that the water easily remove out of the slides.

7. Let, it dry in air for few hours and then observe the slides under oil immersion objective lens of the microscope. As shown in (**Fig 1 and Fig 2**).

Blood samples drawn in EDTA and Clot activator vials were analyzed at Centre of Wildlife Health, College of Veterinary Science, OUAT, Bhubaneswar, Odisha.

Hematological values were obtained from EDTA vial using hematology analyzer for processing. The blood smears were fixed in methanol and were used for differential leukocyte counts after staining with Giemsa stain.

Biochemical blood parameters were obtained from Clot activator vial using Serum biochemistry analyzer for processing.

BEFORE TREATMENT

Blood parameters	Values	Normal range
Neutrophil (%)	68	50-70
Lymphocyte (%)	25	20-40
Monocyte (%)	3	2-8
Basophil (%)	1	1-2
Eosinophil (%)	3	0-10

AFTER TREATMENT

Blood parameters	Values	Normal Range
Neutrophil (%)	72	50-70
Lymphocyte (%)	22	20-40
Monocyte (%)	2	2-8
Basophil (%)	1	1-2
Eosinophil (%)	3	0-10

Clinical Findings

Before the treatment, the haemato-biochemical values of the elephant was found to be as follows.

1. Hematological parameters.

Date of examination	Elephant's name	Parameters	Normal range	Results
13.08.2021	Kartik	Hemoglobin(g%)	11-17	9.5
		TLC (%)	5-12	10
		PCV (%)	32-53	41
		RBC (millions/Cumm)	7-13	8.2
		Differential Leucocyte Count (%)		

		Heterophils	50-70	55
		Eosinophil	0-10	3
		Lymphocyte	20-40	25
		Monocyte	2-8	6
		Basophil	1-2	-
		Platelet (lakh/cu mm)	5-10	6.61

2. Biochemical Parameters

Date of examination	Elephant's name	Parameters	Normal range	Results
13.08.2021	Kartik	ALT (IU/L)	1.5-3	7.5
		AST (IU/L)	4-56.5	62.8
		ALP (IU/L)	0-285	209.1
		Urea (mg/dl)	5-15	15.7
		Creatinine (mg/dl)	1-1.3	1.2

From the report, it is clearly observable that the ALT, AST values were found to be higher than the normal range indicating liver affection.

***Treatment protocol**.

Sl. No.	Name of the medicine	Route of administration	Treatment protocol followed
1	Tribivet-M Inj.	Intra-muscularly	Given 20 ml once daily for 15 days.
2	Belamyl Inj.	Intra-muscularly	Given 15 ml at every alternate days for 10 occasions.
3	T-PHOS Inj.	Intra-muscularly	Given 20 ml at every 2 days interval for 10 occasions.
4	Intacal-IM Inj.	Intra-muscularly	Given 20 ml at every alternate days for 10 occasions.
5	Ecotas bolus	P.O	Two boluses orally twice in a day for 15 days.

After 21 days, blood was collected in EDTA and Clot Activator vials which were analyzed at Centre of Wildlife Health, College of Veterinary Science, OUAT, Bhubaneswar, Odisha.

The Haemato-biochemical values were recorded to be as follows.

3. Hematological parameters

Date of examination	Elephant's name	Parameters	Normal range	Results
16.09.2021	Kartik	Hemoglobin(g%)	11-17	13.5
		TLC(%)	5-12	11
		PCV (%)	32-53	47
		RBC (millions/Cumm)	7-13	9.2
		Differential Leucocyte Count (%)		
		Heterophils	50-70	52
		Eosinophil	0-10	5
		Lymphocyte	20-40	25
		Monocyte	2-8	5
		Basophil	1-2	1
		Platelet (lakh/cu mm)	5-10	7.2

4. Biochemical parameters

Date of examination	Elephant's name	Parameters	Normal range	Results
16.09.2021	Kartik	ALT (IU/L)	1.5-3.0	2.5
		AST (IU/L)	4-56.5	24.7
		ALP (IU/L)	0-285	186.8
		Urea (mg/dl)	5-15	6.9
		Creatinine (mg/dl)	1-1.3	1.2

From table no.3 and 4, it is clearly observable that the Hemoglobin (%) has improved after treatment. Moreover, the ALT (IU/L) and AST (IU/L) has come down to the normal range following treatment.

Figures

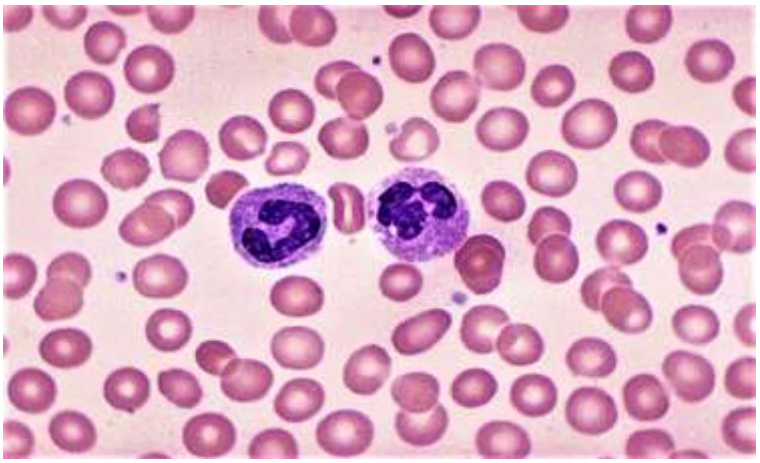

Fig 1: A slide showing neutrophils in a field of slide stained with Giemsa stain.

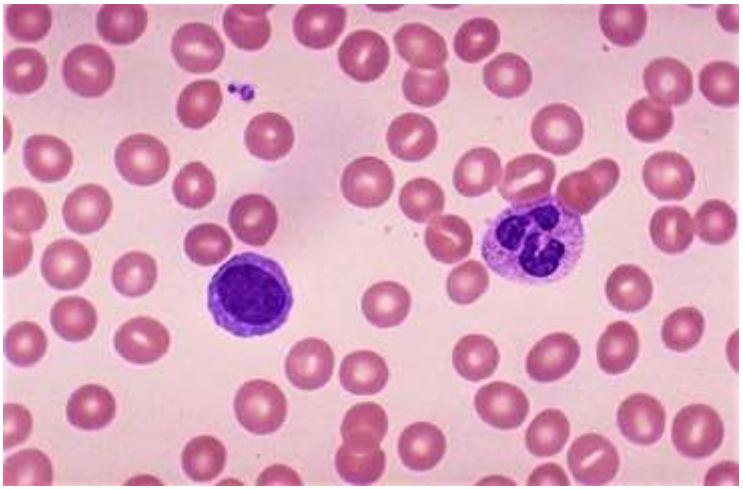

Fig 2: A slide showing lymphocyte and neutrophil in a field of slide stained with Giemsa stain.

DISCUSSION

Management of health of captive elephants is always a challenging task. Proper scientific approach on captive elephant health and diseases are far less and hence evolving remedial measures to promote health and welfare remains a challenging task. Understanding the health related parameters and evidence of diseases in captive-reared elephants will be of significant help towards enriching the management as well as their health care. Hemoglobin and Packed cell volume (PCV) helps us to know about the nutritional status, feed intake ratio and the level of dehydration in captive elephants. The AST, ALT and ALP values indicate about the proper functioning of the liver. Clearly, it is being observed that following treatment, the Hemoglobin, PCV, AST, ALT parameters have shown improvement and all of them were recorded under normal range.

CONCLUSION

The reference values for the hematological and biochemical profile following the treatment protocol was found to be under normal range. The mucous membranes of the conjunctiva and the oral cavity was found to be normal (pinkish). The elephant showed no signs of geophagia, appetite was improved and stool consistency became normal after the treatment. The treatment protocol followed will not only help in monitoring of health, but also diagnostic and therapeutic management and planning against geophagia in case of captive elephants.

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