

HAEMATOLOGY OF CAPTIVE RHESUS MACAQUES (*Macaca mulatta*)

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ABSTRACT

Health status of non-human primates reared at Arignar Anna Zoological Park, Vandalur were determined by studying the haematological parameters. A total of six Rhesus macaques aged from three to seven years were subjected to haematological analysis. Mean values of PCV, Hb, RBC, ESR, WBC, differential count and erythrocyte indices were studied. From this study, baseline information on haematology profile was obtained for the Rhesus macaques.

Key Words : Rhesus macaque, haematology

INTRODUCTION

Haematology is an important clinical diagnostic tool for understanding the animal health. There is a dearth of information on normal haematological baseline reference values in Rhesus macaques (*Macaca mullata*) in India. Understanding the health related parameters in captive non-human primates will be significantly helpful towards a better management of non-human primates in the captive wild animal places like zoos, zoological

parks and zoological gardens. The data collected will help to monitor the health status and effective treatment in these animals as well. Hence, the present study was undertaken to establish base-line haematological parameters for captive rhesus macaques.

MATERIALS AND METHODS

Blood samples were collected from apparently healthy Rhesus macaques to

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assess the various health related parameters. Six blood samples were collected during the routine sampling procedures using the standard method of collection (Fowler, 1986) at Arignar Anna Zoological Park, Vandalur. Age of the animals ranged from 3 years to 7 years. Collection was done subsequent to the restraint of the animals using chemical immobilization. Combination of ketamine hydrochloride and xylazine hydrochloride was used at the dose rate of 10 mg/kg body weight and 1 mg/kg body weight respectively, using a blow pipe.

Six blood samples (three males and three females) was collected from the saphenous vein using a sterile 20G needle and about 6ml of blood was drawn. Blood samples were subsequently transferred to vacutainer tubes containing EDTA for assessment of haematology related profile.

The Erythrocyte sedimentation rate (ESR) was measured, using Wintrobe haematocrit method and was observed for one hour, and the reading was taken as mm/hr. The haemoglobin (Hb) was measured by acid-haematin method using haemoglobinometer and expressed in gram per deciliter. Packed cell volume (PCV) was estimated using microhaematocrit tube and was expressed in percent. Total red blood cell count (RBC) and white blood cell count (WBC) was done using the haemocytometer and expressed as millions per cmm and thousands per cmm respectively. The smears were fixed in methanol. Leishman's stain was used for carrying out differential leukocyte count.

Erythrocyte indices like Mean corpuscular volume (MCV), Mean corpuscular

haemoglobin (MCH) and Mean corpuscular haemoglobin concentration (MCHC) were calculated. The haematological examination was carried out as per the methods described by Schalm *et al.* (1975).

RESULTS AND DISCUSSION

Packed cell volume, haemoglobin and total erythrocyte count

The mean \pm S.E. of PCV of 41.50 ± 1.65 % in Rhesus macaques was closer to the values, reported by Fowler (1986). The values for Rhesus macaques under study were in accordance with the value of 40.40 ± 6.30 % , as reported by Kessler and Rawlins (1983). The mean \pm S.E. levels of haemoglobin in Rhesus, macaques was 11.08 ± 0.65 g/dl and the values encountered in the Rhesus macaques under study were in accordance with the value of 12.30 ± 2.00 g/dl, as furnished by Kessler and Rawlins (1983) and is closer to the range of 11.30 to 13.40 g %, as quoted by Wallach and Boever (1983). The mean \pm S.E. levels of total RBC count was 6.64 ± 0.27 10^6 / mm^3 which was closer to the value of 6.38 m/cmm, as reported by Jones *et al.* (1947) in case of Rhesus macaques.

Erythrocyte sedimentation rate

The mean \pm S.E. levels of ESR in Rhesus macaques under this study was 1.08 ± 0.27 mm/hr in accordance with the values quoted by Wallach and Boever (1983).

Erythrocyte indices

The mean \pm S.E. values of MCV, MCH and MCHC were 62.50 ± 0.30 fl, 16.88 ± 1.36

pg and $27.00 \pm 2.15 \%$, respectively. Wider variations were encountered by many authors, with regard to MCV, MCH and MCHC levels in case of non-human primates. With regard to erythrocyte indices estimated in the Rhesus macaques under study, the mean \pm S.E. values of MCHC were found to be closer to the values recorded by Fowler (1986).

Total leukocyte count and differential leukocyte count

The mean \pm S.E. value of total leukocyte count was $8.67 \pm 0.89 \text{ } 10^3/\text{mm}^3$ and the values obtained in this study were however lower than the values quoted by Jones *et al.* (1947). In this species, the differential leukocyte counts were Lymphocytes $5.18 \pm 0.51 \text{ } 10^3/\text{mm}^3$, Neutrophils $3.32 \pm 0.60 \text{ } 10^3/\text{mm}^3$, Monocytes $0.12 \pm 0.05 \text{ } 10^3/\text{mm}^3$, Eosinophils $0.05 \pm 0.02 \text{ } 10^3/\text{mm}^3$ and Basophils $0.00 \pm 0.00 \text{ } 10^3/\text{mm}^3$, respectively.

The differential leukocyte count revealed increased presence of lymphocytes than neutrophils, in general. This was in accordance with the report presented by Wallach and Boever (1983) and Fowler (1986). However, Kessler and Rawlins (1983) opined that the relative percentage of neutrophils was greater and the percentage of lymphocytes was lower in case of Rhesus macaques. The findings in the present study with regard to the lymphocytes and neutrophils, was further supported by Rahaman *et al.* (1975) who quoted that there was a progressive reduction in the lymphocyte count as one climbs the primate scale, reaching a minimum in the Chimpanzee, while conversely neutrophils which are lowest in the loris increase in number

as the scale ascend. The greater the lymphocytes, greater the immunological competence of the animal and in case of higher primates, this will be compensated by the increased number of neutrophils. It was interesting to note that the basophils were absent during the differential count of Rhesus macaques in this study and this was indirectly supported by Rahaman *et al.* (1975) who quoted that basophils are absent in both loris and Bonnet monkeys.

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