

SERUM TESTOSTERONE LEVEL IN CAPTIVE MALE ELEPHANTS (*ELEPHAS MAXIMUS MAXIMUS*) IN SRI LANKA

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Changes in Serum Testosterone Levels (STL) in captive male elephants were examined and categorized according to stage of musth (n=42), time of the day (n=4; 2 in pre-musth and 2 in non-musth) and age of the animal (n=32 in non-musth). The association between STL and the "temperament" of the captive elephants studied (n=33) during non-musth period was also evaluated. Further, attempts were made to determine the effect of anti-androgenic drug -"Flutamide" (250mg tablets) and "Oestradiol benzoate" (0.2mg/ml; "Intervet International B.V., Boxmeer - Holland") as means of controlling musth (n=1). Samples were collected during 6.00 h to 12.00 h except for the evaluation carried out to determine the variations of STL during the time of the day.

Blood samples were collected from an ear vein and serum testosterone levels were measured by using the ImmuChem™ radio immunoassay kit ("ICN Pharmaceuticals, Inc., Diagnostic Division, Costa Mesa, CA 92626").

The STL ranged from 0.02-27.33 nmol/L (n=32) in non-musth, 26.31-49.97 nmol/L (n=6) in pre-musth, 47.36 - >68 nmol/L (n=3) in full-musth and 40.16 nmol/L (n=1) during post-musth period, respectively. Two male elephants in non-musth, at 6.00 - 12.00 h, 12.00 - 18.00 h and 18.00 - 24.00 h, had STL of 2.9 ± 2.7 nmol/L (n=2), 0.65 nmol/L (n=1) and 2.32 nmol/L (n=1), respectively. Two other males during pre-musth also had similar pattern of STL, but slightly elevated levels. Average STL of adult elephants (10-25 years) was 5.92 ± 1.5 nmol/L (n=18), of prime-adults (26-50 years) was 3.46 ± 2.1 nmol/L (n=11) and of senior adults (51-75 years) was 0.23 ± 0.06 nmol/L (n=3). Serum testosterone levels in "non-obedient" elephants ranged from 0.02-11.53 nmol/L while in "obedient" elephants it varied from 0.02-27.33 nmol/L. The mean STL for "non-obedient" elephants was 3.59 ± 1.5 nmol/L (n=9) and in "obedient" elephants it was 4.42 ± 1.5 nmol/L (n=24).

One month after the onset of musth in a non-obedient male, signs had to be controlled for which, 7 tablets of Flutamide was given daily for 2 weeks. Serum testosterone level was reduced in this animal to 24.76 nmol/L following treatment. A subsequent intramuscular injection of 20 mg of Oestradiol benzoate could reduce it further to 9.47 nmol/L.

It can be stated that, STL in captive male elephants in Sri Lanka are comparable to published values. The relative increase in STL when approaching musth was anticipated. Inverse relationship between STL and age of the animal was expected. Higher levels of hormone in the morning may indicate that the keeper has to be careful in the morning hours when releasing the animal. In addition, when captive breeding is attempted, morning hours would possibly produce better quality semen. However, male elephants that are known to be "obedient" did not always have low levels STL. Three extremely corporative males had very high level of testosterone indicating the possibility of contribution by other factors for temperament. This finding has immediate use for elephant owners and keepers, for their safety. When keepers are being changed, this factors need to be considered by elephant owners.