Cholesterol Levels, High-Density Lipopolysaccharide and Triglyceride of Civet (*Paradoxurus hermaphroditus*)

Sarmin
Department of Physiology, Faculty of Veterinary Medicine, GadjahMada University,
Jl. Fauna 2 Karangmalang, Yogyakarta 55281. Telp +62-274-560864, Fax +62-274-560861, emai: sarminkh76@ugm.ac.id

Abstract

Civet (*Paradoxurus hermaphrodites)* is wild animals included in the list of almost extinct animals. Various chemical indicators that are important in determining the health status of that animals has not been available until now. This study aims to determine the levels of cholesterol, High-Density Lipopolysaccharide (HDL) and triglyceride on the 3 health of Civet (Paradoxurus hermaphroditus). Changes in plasma concentrations of cholesterol, HDL and triglyceride underlying same physiological states were monitored. The results shown that the mean values of cholesterol levels at 181.21 ± 44.50 mg /dl, while Triglyceride levels at 55.38 ± 5.65 mg/dl and HDL levels at 47.73 ± 16.66 mg/dl. The values of these biochemical apparently healthy animal provide valuable baseline information for use in medical further studies performed with this species.

Key words: Cholesterol, Paradoxurus hermaphroditus, High-Density Lipopolysaccharide, Triglyceride

Introduction

Civet is a rare, nearly to extinct animal. For the purposes of conservation, to date there is not much literature is available related to blood biochemistry of this species to determine the animal health status. In addition to assess the metabolic condition of animals, hematological and biochemical parameters could be affected by many factors including: sex, age, reproductive status and seasonal variations (Al-Eissa et al., 2008; Çetin et al., 2009). This study specifically examines the form of metabolites in blood cholesterol, HDL and triglyceride. Other animal studies indicate the presence of variations in blood chemistry including cholesterol, triglyceride, and HDL as the goats by Widiyono and Sarmin (2011) and Mitruka and Rawnsley (1981), cattle, sheep, pig, and horse (Kraft and Duerr, 1999). This study aims to assess the preview of cholesterol, HDL, and triglycerides as beginning and basic information on blood chemistry for civet.

Materials and Method

A total of three healthy civets with 2-4 months old are used in this study. Civet adapted for two weeks in a cage and get food freely. Blood was collected through the femoral vein, immediately separated for cholesterol, HDL and triglyceride analysis. Chemical analyses were performed using spectrophotometer and standard methods described by Kraft and Duerr (1999). The data were given as mean and standard deviation.

Results

The mean and standard deviation of cholesterol, triglyceride, and HDL is shown on table 1.

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Table 1. Comparison of Choleserol, HDL, and Triglyceride (Mean±SD) in Civet (our study), Adult (5 years) Caspian miniature horses, German Improved fawn goats, West African Dwarf (WAD) goats, Holstein heifer, Spanish ibex from Andalusia, Wild-dusky-footed wood rats, Wild grasscutters, *Ettawa crossbred and* Anngora rabit

Parameter	Civet (Our study)	Adult (5 years) Caspian miniature horses (Nazifi et al., 2005)	German improved fawn Goats (Žubčić, 2001)	West African Dwarf (WAD) goats (Opara et al., 2010)	Domesticated Rabbits (Al-Eissa, 2011)	Holstein heifer (Rasoli et al., 2004)	Spanish ibex from Andalusia (Pe´ rez et al., 2003)	Wild-dusky-footed wood rats (*Neotoma fuscipes) (Weber et al., 2002*	Wild grasscutters (Opara et al., 2006)	*Ettawa crossbred*	Anngora rabit (*Çetin et al., 2006)*
Cholesterol (mg/dL)	181.21±44.5	91.26±5.94	3.06±1.44	31.32±1.44	127.66±5.13 (non pregnan) 54.85±0.51 pregnan rabbits	1.82±0.06 (Summer) 2.53±0.06	53.06±21..8	127±39..90	195.65±5.49	82.47±27.26	-
HDL	47.73±16.66	25.02±2.34									
Triglyceride	55.38±5.65	5.04±1.44		47.4±4.5			37.1±37.8			35.35±16.41	158.76 ± 5.74

Discussion

This study is a preliminary study on civet related to levels of cholesterol, HDL and Triglyceride. There is little information concerning blood lipid in civet. Cholesterol concentrations in civet are 181.21(69.56-150.00) mg/dL. This concentration is higher than the concentration of cholesterol in Angora Rabbits (Çetin et al., 2009), Domestic Rabbit (AL-Eissa, 2011), West African Dwarf (WAD) goats (Opara et al., 2010), adult male and female Caspian miniature horses (Nazifi et al., 2005), mountain reedbucks (Reduncula fulvorufula) (Vahala et al., 1991), and cattle of Holstein heifer (Rasooli et al., 2004) , German improved fawn Goats (Žubčić, 2001, Spanish ibex from Andalusia (Perez et al., 2003) , and Wild-dusky-footed wood rats (*Neotoma fuscipes)* (Weber et al., 2002). However, this concentration is lower than the concentration of cholesterol in wild grasscutters (Opara et al., 2006) and similar to the value reported for adult Ottawa crossbred (Widiyono and Sarmin, 2011). It is believed that race and activities affecting the serum cholesterol levels (Guyton, 1986; Silva and Danggola, 2002).

Triglyceride concentration in the civet is 55.38+5.65 (31.58-42.85) mg/dL below the level triglyceride of female of Angora Rabbits (Çetin et al., 2009), however, higher than the values reported for adult male and female Caspian miniature horses (Nazifi et al., 2005), horses and ponies (Bauer et al., 1990), Turcoman horses (Nazifi et al., 2003), West African Dwarf (WAD) goats (Opara et al., 2010), Spanish ibex from Andalusia (Perez et al., 2003), adult Ettawa crossbred (Widiyono and Sarmin, 2011) and Domesticated and wild Asian elephant in Sri Lanka (Silva and Danggola, 2002). The difference of triglyceride and cholesterol concentration influenced by factors of species also in our opinion this is due to the circumstances of feeding conditions (Žubčić, 2001).

The concentration of lipoproteins in the HDL concentration of Civet include at level 47.73 mg / dL with a range of 15.54-48.84 mg / dL, higher than the values reported for adult male and female Caspian miniature horses (Nazifi et al., 2005). The high HDL is similar to the phenomenon known in cats that have the highest percentage of HDL of the domestic species characterized to date. Cattle have approximately equal HDL and LDL cholesterol concentrations. In sheep and horses, the majority of cholesterol circulates as HDL. In pigs, more than half of the total cholesterol circulates as LDL and VLDL combined (LATIMER et al., 2003). These species differences are due to nutritional and metabolic differences. The existence of differences in levels of cholesterol, triglycerides are due to differences of race animals, environmental temperature, sex, and hormonal changes (Al-Eissha and Alhomida, 1997), and feeding (Abrams, 1980, Opara et al., 2006). In conclusion, there is a specific preview of cholesterol, triglyceride, and HDL for Civet that can help when interpreting laboratory results in civet.

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References

Abrams HL. 1980: Vegetarianism: An Anthropological /Nutritional Evaluation. J. Appl. Nutr. 32:2.

AL-Eissa M. S., 2011. Effect of gestation and season on the haematological and biochemical parameters in domestic rabbit (*Oryctolagus cuniculus)*, *British Biotechnology Journal* 1(1): 10-17

Bauer, E., D. Y. Meyer, M. Campell, R. McMurphy, 1990. Serum lipid and lipoprotein changes in ponies with experimentally induced liver disease. Am. J. Vet. Res. 51, 1380- 1384.

Çetin N, T. Bekyürek, E. Çetin, 2009. Effects of sex, pregnancy and season on some haematological and biochemical blood values in Angora rabbits. Scand. J. Lab. Anim. Sci. Vol. 36 No. 2

Guyton, A.C. 1986. Textbookof Medical PhysioloSy.WB. Saunders company, Harcourt Brace Jovanovich, Inc.

Kraft W and Duerr UM. 1999. *Klinische Labordiagnostik in der Tiermedizin*, 5. Auflage. Schattauer, Stuttgart.

Latimer KS, Mahaffey EA, Prasse KW, 2003. Duncan and Prasse's Veterinary Laboratory Medicine: Clinical pathology, 4th edn. Iowa State Press, USA

Nazifi, S., M. Saeb, M. Abedi, 2003. Serum lipid profiles and their correlation with thyroid hormones in clinically healthy Turkoman horses. Comp. Clin. Path. 12, 49-52.

Nazifi, Saeed, Mahdi Saeb, Saleh Rategh, and Abbas Khojandi, 2005. Serum lipids and lipoproteins in clinically healthy Caspian miniature horses, Veterinarski Arhiv 75 (2), 175-182

Ogunsanmi AO, Ozegbe PC, Ogunjobi O, Taiwo VO, Adu JO. 2002: Haematological,plasma biochemistry and whole blood minerals of the captive adult African grasscutter (*Thryonomis swinderianus Temminck*). Trop. Vet.,20*(1)*:27.

Opara M. N., K. A. Ike, I. C. Okoli, 2006. Haematology and Plasma Biochemistry of the Wild Adult African Grasscutter (*Thryonomis swinderianus*, Temminck), The Jurnal of American Science 2(2)

Opara, M.N., Udevi, N. and Okoli, I.C., 2010. Haematological Parameters And Blood Chemistry Of Apparently Healthy West African Dwarf (Wad) goats In Owerri, South Eastern Nigeria, New York Science Journal:3(8)

Perez JM, FJ Gonzalez, JE Granados, MC Perez, P Fandos, RC Soriguer, and E Serrano, 2003. Hematologic and biochemical reference intervals for Spanish ibex, *Journal of Wildlife Diseases*, 39(1), pp. 209-215

Rasooli, A.,Nouri M, Khadjeh GH, Rasekh A, 2004. The Influences of seasonal variations on thyroid activity and some biochemical parameters of cattle, Iranian Journal of Veterinary Research, University of Shiraz, Volume 5 No. 2 1383

Silva , Indira & Ashoka Dangolla, 2002. Blood levels of cholesterol and triglycerides in wild anddomesticated Asian elephants (Elephas rn. maximzs) in Sri Lanka. Gajah (2l) 53-55

Vahala J., J. PospfsiI, R. Pokorny and F. Kase, 1991. Blood serum biochemical values of Montain Reedbucks (Reduncula Fulvorufula): Variations with sex and season, *Acta Vet Brno:* 60: 143-148

Weber,David K.,Kathleen Danielson,Stan Wright, and Janet E. Foley, 2002. Hematology and Serum Biochemistry Values of Dusky-Footed Wood Rat (Neotoma Fuscipes), *Journal of Wildlife Diseases,* 38(3), 2002, pp. 576–582

Widiyono and Sarmin, 2011. Reference Value of Some Blood Chemistry Parameters for Adult Ettawa Crossbred Goat, International Conference of Biological Sciences (ICBS Bio-UGM 2011)

Žubčić, Damir 2001. Some biochemical parameters in the blood of grazing German improved fawn goats from Istria, Croatia, Veterinarski Arhiv *71* (5), 237-24