Bulgarian Journal of Veterinary Medicine (2007), **10**, No 2, 123–125

Short communication

SERUM LIPID AND LIPOPROTEIN PARAMETERS OF IRANIAN PERSIAN CAT (*FELIS CATUS*)

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The Persian cat (*Felis catus*) is a rare feline species whose origins historically come back to Persia. These cats have sturdy bodies, short legs, round and broad head and long and tick fur. At present time, this species mainly live in some provinces of Iran. *Felis catus* has been used in many breeding programmes and exhibitions in cat show (Dimski *et al.*, 1992). However, in the literature, limited information is available on concentrations of circulating lipids and lipoproteins of this species (Demacker *et al.*, 1987; Seymour, 1997; Butterwick *et al.*, 2001). On the other hand, different wild felid species show variations in their serum biochemical profiles such as lipid and lipoprotein contents (Watson *et al.*, 1995). With this regard, in spite of high distribution of the hybrid Persian cat in the world, there is no literature about its serum lipid and lipoprotein values. The purpose of this study was to measure serum total lipids, triglyceride (TG), total cholesterol (TC), phospholipid (PL), high density lipoprotein cholesterol (HDL-C), very low density lipoprotein cholesterol (VLDL-C) and low density lipoprotein cholesterol (LDL-C) levels in the Persian cat.

For the present study, 15 clinically healthy fasting Iranian Persian cats (about 2 years old) were captured from Tabriz and Tehran provinces of Iran in the autumn 2004. Cats were kept in catteries (12h light:dark cycle at 22 ± 2 ºC) for one week. They were fed twice a day (morning and evening) a commercial diet (Purina, Nestle, and French). Animals were restrained manually. Blood samples (5 mL) were collected in the afternoon from the jugular vein and analyzed for serum TG (by the GPO-PAP method) and TC (by the CHOD-PAP method) (Watson *et al.*, 1995). Samples were kept at −80 °C until analysis. PL values were measured through direct digestion procedure in the presence of vanadium pentoxide as catalyst (Naito, 1975). Total lipid values were calculated by summation of them. HDL-C values were measured after manganese chloride-heparin sulphate precipitation of apoB containing lipoproteins (Burstein *et al.*, 1970). VLDL-C values were measured directly after precipitation with sodium dodecyl sulphate and LDL-C values were calculated by difference (Ononogbu & Lewis, 1976). Levels of lipid and lipoprotein parameters in males (n=6) and females (n=9) were compared by means of Student's t-test.

Serum total lipids, TC, TG, PL, HDL-C, VLDL-C and LDL-C values of the Iranian Persian cat are shown in Table 1. We have found that there was no difference between sexes in terms of total lipids, TC, PL and HDL-C values. However, our

analysis revealed that male cats had higher TG and VLDL-C (about 14%) and lower LDL-C (about 129%) than females.

In the present study, we have shown that HDL-C values were higher than the LDL-C values (Table 1). In line with our findings, Demacker *et al.* (1987) showed that in sexually intact cats, HDL-C values were 5 times greater than LDL-C values. With this regard, we have found that HDL was the major carrier of cholesterol in both male (69%) and female (54%) ones. Furthermore, Demacker *et al.* (1987) and Ginzinger *et al.* (1999) argued that the cat is a HDL animal. This state can be due to the absence of cholesteryl ester transfer protein (CETP) in cats (Watson *et al.*, 1995; Ginzinger *et al.*, 1999). Moreover, Demacker *et al.* (1987) and Richl & Miller (1989) argued that in cats, HDL2 was the major HDL subgroup, enriched with cholesteryl ester.

Serum HDL-C values in Iranian Persian cats were similar to those reported by Dimski *et al.* (1992) (2.05±0.6 mmol/L) but were lower than those reported by Butterwick *et al.* (2001) (4.3± 0.71 mmol/L).

In Iranian Persian cats, serum LDL-C values were similar to those reported by Dimski *et al.* (1992) (1.27±0.34 mmol/L) and Butterwick *et al.* (2001) (1.78±0.76 mmol/L). The VLDL-C values of Iranian Persian cats were similar to those reported by Dimski *et al.* (1992) (0.28±0.18 mmol/L) and Butterwick *et al.* (2001) (0.25±0.12 mmol/L).

Serum TG values in Iranian Persian cats were higher than those reported by Seymour (1997) (0.35±0.01 mmol/L) and Butterwick *et al.* (2001) (0.49±0.08 mmol/L). On the other hand, our TC data were similar to those reported by Butterwick *et al.* (2001) (3.52± 0.75 mmol/L) but lower than those reported by Seymour (1997) (6.23±1.2 mmol/L). Furthermore, in agreement with Demacker *et al.* (1987) we have shown that male Iranian Persian cats had higher TG values when compared to the female ones. Higher LDL-C and lower TG concentrations in female Iranian Persian cats than the male ones may be due to the lower conversion of intermediate density lipoprotein to LDL. In humans, females have higher conversion rate than the male ones. This condition might be due to the effect of sex steroids (estrogens) on the activity of hepatic triglyceride lipase. However, Demacker *et al.* (1987) discussed that other factors besides estrogens may regulate hepatic lipase activity in cats. In this regard, Butterwick *et*

Table 1. Serum concentrations (in mmol/L) of total cholesterol (TC), triglycerides (TG), phospholipids (PL), high density lipoprotein cholesterol (HDL-C), very low density lipoprotein cholesterol (VLDL-C) and low density lipoprotein cholesterol (LDL-C) and total lipids of Iranian Persian cats. Values are expressed as mean ± SD in males (n=6) and females (n=9)

Gender	TC	TG	PL	HDL-C	VLDL-C	LDL-C	Total lipids
Male	2.96 ± 0.44	1.73 ± 0.21	11.52 ± 4.1	2.06 ± 0.62	0.35 ± 0.04	0.55 ± 0.03	16.35 ± 4.14
Female	3.21 ± 0.35	1.48 ± 0.08	12.57 ± 2.82	1.73 ± 0.27	0.30 ± 0.02	1.26 ± 0.26	17.21 ± 2.45
P value*	0.242	0.006	0.565	0.177	0.007	<0.001	0.619

* indicates differences between genders

al. (2001) showed that there is not any difference in the hepatic triglyceride lipase activity between female and male cats.

Serum PL values of Iranian Persian cats were higher than those reported in the neutered cats (2.93±0.12 mmol/L) (Pazak *et al.*, 1998).

Our study has revealed significant differences in the levels of some lipid and lipoprotein parameters between Iranian Persian cats and domestic ones (Demacker *et al.*, 1987; Seymour 1997; Pazak *et al.*, 1998; Butterwick *et al.*, 2001). Watson *et al.* (1995) attributed these differences to the effects of species, age, diet and methods of analysis.

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Paper received 11.06.2006; accepted for publication 03.05.2007

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