

The Short-Term Stress Indicators in Home and Experimental Dogs

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Abstract : Stress is a response of the body to physical or psychological environmental stressors. Cortisol level in blood serum is determined as the main indicator of stress, but the blood collection, the animal preparation and other activities can cause unpleasant conditions and induce increase of these hormones. Therefore, less invasive methods are searched to determine stress hormone levels, for example, by measuring the cortisol level saliva. The aim of the study is to find out the changes of stress hormones in blood and saliva in home and experimental dogs in simulated short-term stress conditions. The study included clinically healthy experimental beagle dogs (n=6) and clinically healthy home American Staffordshire terriers (n=6). The animals were let into a fenced area to adapt. Loud drum sounds (in cooperation with 'Andžeja Grauda drum school') were used as a stressor. Blood serum samples were taken for sodium, potassium, glucose and cortisol level determination and saliva samples for cortisol determination only. Control parameters were taken immediately before the start of the stressor, and next samples were taken immediately after the stress. The last measurements were taken two hours after the stress. Electrolyte levels in blood serum were determined using direction selective electrode method (ILab Aries analyzer) and cortisol in blood serum and saliva using electrochemical luminescence method (Roche Diagnostics). Blood glucose level was measured with glucometer (ACCU-CHECK Active test strips). Cortisol level in the blood increased immediately after the stress in all home dogs ($P < 0,05$), but only in 33% ($P < 0,05$) of the experimental dogs. After two hours the measurement decreased in 83% ($P < 0,05$) of home dogs (in 50% returning to the control point) and in 83% ($P < 0,05$) of the experimental dogs. Cortisol in saliva immediately after the stress increased in 50% ($P > 0,05$) of home dogs and in 33% ($P > 0,05$) of the experimental dogs. After two hours in 83% ($P > 0,05$) of the home animals, the measurements decreased, only in 17% of the experimental dogs it decreased as well, while in 49% measurement was undetectable due to the lack of material. Blood sodium, potassium, and glucose measurements did not show any significant changes. The combination of short-term stress indicators, when, after the stressor, all indicators should immediately increase and decrease after two hours, confirmed in none of the animals. Therefore the authors can conclude that each animal responds to a stressful situation with different physiological mechanisms and hormonal activity. Cortisol level in saliva and blood is released with the different speed and is not an objective indicator of acute stress.

Keywords : animal behavior, cortisol, short-term stress, stress indicators

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