Applied Biological Research 13 (2): 110-112, 2011 **Short communication**

EFFECT OF VARIOUS RENAL BIOPSY TECHNIQUES ON CLINICO-PHYSIOLOGICAL OBSERVATIONS IN DOGS

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ABSTRACT

The present study was aimed at to observe the changes in various clinico-physiological parameters in dogs subjected to different renal biopsy techniques. Eighteen mongrel dogs, divided randomly into 3 groups, were subjected to ultrasound-guided biopsy using 14-G Tru-cut biopsy needle (group I), ultrasound-guided fine-needle aspiration biopsy using 18-G spinal needle mounted on 10 ml syringe (group II) and laparoscope-guided biopsy using laparoscopic biopsy forceps (group III). Post biopsy analysis of various parameters like rectal temperature, heart rate, respiration rate and skin fold tenting test revealed non-significant difference ($P \geq 0.05$) at any post-procedural interval. This indicated that all these renal biopsy techniques in dogs were safe.

Keywords: Biopsy, clinico-physiological changes, dog, renal

Renal diseases are common in dogs and cats. Information, physical examination and clinical laboratory data often allows for the differentiation of renal diseases into the general categories of acute renal failure, chronic renal failure and glomerular disease (Vaden, 2005). Renal biopsy provided information that may confirm, support or eliminate the diagnostic probabilities formulated on the basis of history, physical examination, laboratory data, diagnostic radiographic or ultra-sonographic evaluation (Rezaie *et al*., 2008). By detecting the underlying cause for renal dysfunction, a specific therapy can be formulated (Drost *et al.,* 2000). Different renal biopsy techniques in small animals in vogue were percutaneous biopsy (Rezaie *et al*., 2008), keyhole technique (Vaden, 2004) and biopsy during laparotomy or laparoscopy (Mayhew, 2009). In recent years the technique of ultrasound-guided biopsy (USGB) of organs such as liver, kidney, spleen, pancreas, stomach, prostate and intestine have been introduced (Rezaie *et al*., 2008). In order to ensure the safety of these techniques, the study was conducted to monitor the effect of these techniques on the clinicophysiological observations in dogs.

The experiment was conducted on 18 apparently healthy mongrel dogs of either sex, aged 6 months to 2 years with body weight ranging from 8 to 25 kg. The dogs were randomly divided into 3 groups i.e. I, II and III, of 6 animals each. Group I animals were subjected to ultrasound-guided biopsy using 14-G Tru-cut biopsy needle (Tru-cut biopsy needle, Baxter Healthcare Corp., Valencia, CA, USA length 15 cm and specimen notch 2 cm). Group II animals were subjected to ultrasound-guided fine-needle aspiration biopsy using 18-G spinal needle mounted on 10 ml syringe. Group III animals were subjected to laparoscope-guided biopsy using laparoscopic biopsy forceps. The animals following biopsy were kept under close supervision for 24 h and food, water intake, urination and general health were observed throughout the study period. Respiration rate, heart rate, rectal temperature and skin fold tenting test

were recorded at 0, 24, 48 and 72 h post-biopsy in all the groups. The data generated was subjected to statistical analysis following the standard procedures (Snedcor and Cochran, 1982).

Over 33% complications following biopsy occur after 8 hr (Whittier and Korbet, 2004). Close observation of the animals for 24 h following biopsy to monitor any adverse or untoward reactions of any of the biopsy techniques was thus justified. Food and water intake was normal in all the animals of groups II and III. However in group I two animals did not take food normally at 24 h post-biopsy interval, although water intake was normal. This could be attributed to more pain experienced by these animals which were obese; and because of excessive omental and perirenal fat posed difficulty in accessing the kidney and lead to the excessive unnecessary needle manipulation before collecting the biopsy material. By 72 h post-procedural interval all the animals that underwent biopsy took food and water normally. These findings are in consonance with Patel *et al*. (2007) who reported normal general health, appetite, water intake and urination in all the dogs that underwent biopsy while adopting observation period of 5 days. The present findings correlate with Rezaie *et al*. (2008) who reported that appetite, mucous membrane colour and capillary refill time were normal on day 1, 2, 3, 7, 14 and 28 post-biopsy in all the dogs that underwent USG-guided biopsy with manual Vim Tru-cut 18-G disposable tissue-core biopsy needle.

The various aspects of clinical examination included rectal temperature, respiration rate, heart rate and skin fold tenting test (Table 1). The base value of rectal temperature, respiration rate and heart rate in the animals of all groups were within normal reference range indicating normal health in test animals. The rectal temperature and respiration rate in all the groups increased from base value at 24 h post biopsy, started decreasing at 48 h post-biopsy and then tended to reach the base value by 72 h. The heart rate in groups I and II followed the same trend but in group III heart rate increased upto 48 h post biopsy, thereafter decreased till end of study period. However, these changes were not significant and the physiological parameters remained within normal reference limits in all groups throughout the study period. These findings are in total agreement with Rezaie *et al.* (2008) who reported that these parameters are within normal reference range, after clinical evaluation on day 1, 2, 3, 7, 14 and 28 post-biopsy while studying complications following USG- guided needle biopsy of kidney in dog. The in-significant increase in respiration rate following biopsy could be the secondary effect of increased

Table 1: Some clinico-physiological observations (mean ± SE) in different groups of dogs at various time intervals after biopsy by various techniques

Parameter	Groups*	Time (h)			
		0	24	48	72
Rectal temperature (^{o}C)	I	38.82±0.34	39.19±0.17	38.95±0.08	38.81±0.16
	II	38.83±0.08	39.08±0.16	38.92±0.06	38.79±0.08
	III	38.72±0.09	38.96±0.08	38.92±0.09	38.89±0.12
Respiration rate (breaths min^{-1})	I	28.33±1.81	31.17±1.58	30.67±2.33	30.00±2.00
	II	27.17±1.86	29.0±2.13	27.83±1.58	26.50±0.43
	III	29.17±1.74	30.33±1.20	29.83±1.14	29.33±0.84
Heart rate (beats min^{-1})	I	90.83±2.84	93.83±2.10	92.33±2.59	91.66±2.18
	II	94.16±3.10	96.50±3.07	95.16±2.22	94.33±2.77
	III	96.83±2.49	97.00±1.93	97.83±2.93	95.00±1.59
Skin fold tenting test (seconds)	I	0.00±0.00	0.33±0.21	0.17±0.16	0.33±0.21
	II	0.33±0.21	0.16±0.16	0.33±0.21	0.00±0.00
	III	0.33±0.21	0.33±0.21	0.33±0.21	0.33±0.21

*Group I animals subject to ultrasound-guided biopsy using 14-G Tru-cut biopsy needle; Group II animals subject to ultrasound-guided fine-needle aspiration biopsy using 18-G spinal needle; and Group III animals subject to laparoscope-guided biopsy using laparoscopic biopsy forceps

temperature. This was because of the fact that respiration rate increased by two to three times per minute for each degree rise of temperature (Head and Sulter, 1978). Comparisons within and amongst the groups revealed non-significant differences ($P \geq 0.05$) at any post-procedural interval. These findings revealed that all these biopsy techniques had minimal effect on these clinical parameters.

The base value of skin fold tenting test in all groups was within normal reference range without showing any significant difference among the groups thereby indicating proper hydration status of the animals. In animals of groups I and II, the mean values of skin fold tenting revealed insignificant fluctuations ($P>0.05$) throughout the study period. However, in group III the skin fold tenting remained unchanged throughout the study period. These results may be attributed to the minimal effect on the hydration status of animals caused by either of the techniques and the least effect with laparoscopic biopsy.

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