

Comparison of Hemodialysis and Hemofiltration on Experimentally induced Renal Failure in Dog

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Introduction: Renal failure results from damage to the nephrons, causing them to not function properly. Most of many metabolites and toxins that build up in the body lead to the clinical signs. After end-stage renal disease occurs, renal replacement therapy is required, in the form of either dialysis or a transplant. In hemodialysis, plasma BUN and some metabolites are filtered by diffusion across a permeable membrane. In hemofiltration, plasma water is filtered by convection across a highly permeable membrane. All solutes that can pass through the pores of the membrane are carried along with flowing fluid in an amount proportional to their concentration in the blood plasma water. The purpose of the present study was to compare hemofiltration(HF) with hemodialysis(HD) by using pulsatile type(Twin Pulse Life Support; TPLS) in experimentally induced renal failure dog.

Material and Methods: Two healthy dogs (about 30Kg BW) were used. Experimental renal failure was induced by the ligation of bilateral renal artery. A pair of catheters were implanted in jugular vein for dialysis. Daily investigated parameters were clinical signs, laboratory data. Post-dilution(Hemazol) hemofiltration and bicarbonate low-flux polysulphone hemodialysis were started above 90 mg/100ml BUN level. The efficacy was evaluated on the basis of blood chemistry, electrolytes, urea and creatinine reduction rate, urea Kt/V index and serum beta2-microglobuline reduction rate. Heparin was administered 100 IU/Kg before dialysis and then 100 IU/Kg via IV route every 90 minutes.

Results: Clinical signs after induction renal failure were shown severe vomiting, anorexia, diarrhea, mucous feces, ataxia. In hemodialysis and hemofiltration, the urea reduction rate, creatinine reduction rate, urea Kt/V urea index and serum beta2-microglobuline reduction rate decreased every an hour.

Clinical relevance: Post-dilution hemofiltration in comparison with hemodialysis provided the more effective elimination of small and middle uremic toxins molecules. Hemofiltration was a safe and reliable method. We hope that it will be used in small animal clinic.

Key words: Hemodialysis, Hemofiltration, Pulsatile hemodialyzer, renal failure, dog

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