Proceedings of the 8th International Symposium on Canine and Feline Reproduction
ISCFR
June 22-25, 2016
Paris, France

In a joint meeting with the XIX EVSSAR Congress

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Transplantation of amniotic membrane-derived multipotent cells ameliorate and delay the progression of chronic kidney disease in cats
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Chronic kidney disease (CKD) is a common clinical condition in domestic cats. It is characterized by tubulointerstitial, vascular and glomerular inflammation and severe fibrosis. Studies in rodent model of induced CKD have been shown a decrease and stabilization of the clinical condition, evidenced by renal function improvement and by inflammation and renal fibrosis reduction. In this study was evaluated the safety and effect of intra-renal and intravenous infusion of allogeneic mesenchymal stem cells derived from feline amniotic membrane (AMSCs) in cats with naturally occurring CKD. This study was approved by the Faculty of Veterinary Medicine and Animal Science Ethical Committee number: 3240290115. Cat AMSCs were harvested after mechanical and enzymatic digestion of amnion separated from fetal membranes, collected after routine castrations(1). Ten cats, male and female, were enrolled and included in this study. A healthy cat received intrarenal injection of AMSCs guided by ultrasound in both kidneys (5x10\textsuperscript{5} cells/kidney). Nine cats with CDK received repeated intravenous infusions of AMSCs (2x10\textsuperscript{6} cells x 2 treatments). Complete blood count, blood biochemistry, blood gases, blood electrolytes, urinalysis and ultrasound were performed to evaluate clinical condition and disease progression. Analysis of variance (ANOVA) was performed to compare differences between stages of treatment followed by Tukey test to compare means between groups. The clinical parameters of healthy cat did not change, but sedation and general anesthesia was required. The number of interventions stressed the animal and it developed transient hematuria after AMSCs injection. Cats with CDK, registered a significant improvement of renal function (decrease in serum creatinine and urine protein concentrations and increase in urine specific gravity). The kidney architecture and morphology did not change following the treatment. We conclude that feline AMSCs have a renoprotective effect and improve renal function in cats with naturally occurring CKD, stabilizing the clinical condition and disease progression. Thus, intravenous injection of AMSCs may be an important tool to provide well-fare in cats with chronic kidney disease.