

The Cardiac Sodium–Calcium Exchanger Gene (*NCX-1*) is a Potential Canine Cardiac Biomarker of Chronic Mitral Valvular Insufficiency

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Purpose: The levels of *NCX-1* expression in dogs were evaluated to assess the potential of *NCX-1* as a cardiac biomarker to help evaluate congestive heart failure in dogs with chronic mitral valvular insufficiency (CMVI).

Materials and Methods: Real-time reverse transcription polymerase chain reaction (RT-PCR) was utilized to assess *NCX-1* expression in fifteen healthy control dogs and thirty dogs at different stages of CMVI.

Results: The mRNA expression levels of *NCX-1* were determined in peripheral blood cells obtained from the animals used in this study. The fold differences in the levels of mRNA expression compared to controls were 1.44 ± 1.00 in class I, 1.36 ± 0.79 in class II, 5.04 ± 1.29 in class III, and 6.18 ± 1.75 in class IV. The expression of *NCX-1* was significantly increased in classes III and IV ($P < .05$), while expression levels in classes I and II were not significant compared to healthy controls.

Conclusions: The level of *NCX-1* expression increased significantly relative to the severity of the CMVI. *NCX-1* is, therefore, a potential cardiac biomarker for monitoring therapeutic changes and assessing the prognosis of CMVI and heart failure in dogs.

Key words: *NCX-1*, cardiac biomarker, chronic mitral valvular insufficiency, dogs, heart failure

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