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An Innovative Cardiac Biomarker in Veterinary Medicine

Editorial

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In the past, there were many traditional methods for detection of cardiac injury. These methods includes electrocardiography, echocardiography in association with certain cardiac biomarkers. The serum levels of aspartate aminotransferase (AST), creatin kinase (CK), and lactate dehydrogenase (LDH) were formerly used as cardiac biomarkers until the identification of creatine kinase myocardial band (CK-MB), LDH-1 and LDH-2 isomers, which are more specific to cardiac and muscle injury. Recently these enzymes were discovered to be lack of sensitivity and specificity in the presence of either cardiac or muscle injury in human or animals. Therefore, there has been a great interest in human and animal medicine to investigate an innovative heart marker to be used as diagnostic and prognostic tools for human and animal cardiac problems. Cardiac troponin I (cTnI), is an extremely sensitive and precise heart biomarker for diagnosis of myocardial damage in humans and as well as in animals. The cTnI is a regulatory protein that control the calcium mediated interaction between actin and myosin (regulate cardiac contraction). Thetroponin complex consists of three subunits: troponin T,which binds to tropomyosin and facilitates contraction;troponin I, which binds to actin and inhibits actin-myosininteractions; and troponin C, which binds to calcium ions. The amino acid sequences of the cardiac and skeletal isoforms of troponin I and troponin T are satisfactorily different and, consequently, differentially measureable by monoclonal antibody based assays. Troponin C is not used clinically because both the cardiac and skeletal muscle share troponin C isoforms. Cardiac troponin I is 13 times more copious in the heart than creatine kinase

MB isoenzyme, subsequently the signal-to-noise ratio allied with troponin I is much more promising for the discovery of minor levels of cardiac injury. Cardiac troponin T is as copious as troponin I in the heart muscles.It was stated that the values of serum cTnI are increased in response to cardiac injury as a consequence of enzyme leakage from the cardiac cell. Variations in serum values of cardiac troponins have been established to be specific andsensitive markers of myocardium injury in human (withsensitivity of 94 % and specificity of 81%) and dog (withsensitivity of 70-100 % and specificity of 65-81%)

The values of cTn1 in relations to parasitic infestation was studied in dogs infected with *Dirofilaria immitis*, with leishmaniasis and with babesiosis. In the same concern, cTnI is obviously increased in bovine thieleriosis. In addition, it is used for diagnosis of acute white muscle disease in lambs and kids, pregnancy toxemia ingoatsand in pre-clinical toxicology. Moreover, it was detected that cardiac injuries can be persuaded during experimental induction of endotoxaemia by E. coli serotype O55:B5 administration and also by acute ruminal lactic acidosis in sheep. In horses' there are many studies concerning the uses of cardiac troponin as a diagnostic biomarkers in many clinical conditions, as evaluation of poor performance in athletic horses and in equine colic.

In dromedary camels, there are few literatures regarding the use of cTnI in camels. The levels of cTnI has been used recently as a new marker for cardiac injury during camel transportation and camels with tick infestation. Future research should be focused in the use of this enzymeas diagnostic and prognostic biomarker in cases suspected to cause cardiac injury.