

Evaluation of podocin in urine in horses using qualitative and quantitative methods.

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Streszczenie

No sensitive method for diagnosing early kidney dysfunction in horses has been identified so far. Many studies carried out in humans and small animals show that podocin can be useful to diagnose various kidney diseases, mainly affecting the glomeruli. The aim of this study was to perform a qualitative and quantitative analysis of podocin in urine samples obtained from healthy horses, horses with clinical kidney dysfunction and horses at risk of acute kidney injury. The study objectives aimed to assess: (1) whether the selected podocin tryptic peptide for LC-MS-MRM allows for podocin detection in horse; and (2) whether the species-specific ELISA test makes this detection possible as well; (3) whether the chosen methods are sensitive enough to detect kidney dysfunction and glomerular injury, (4) whether the results of the tests applying both methods correspond with one another, (5) whether the results correlate with the hematological and biochemical data. The signals that may indicate the presence of trypsin fragments of podocin were found in three healthy horses, all the horses diagnosed with kidney dysfunction and half of the animals at risk for acute kidney injury. The concentration of podocin, diagnosed with the ELISA test was as follows: from 0.19 to 1.2 ng/ml in healthy animals, from 0.19 to 20.0 ng/ml in AKI horses, from 0.29 to 5.71 ng/ml in horses at risk for acute kidney injury. The results of both methods corresponded significantly. Podocin may be a potential biomarker of clinical kidney disease in horses and may be used in the detection of glomerular injury. However, its use is limited by the possibility of physiological podocyturia. LC-MS-MRM seems to be a more sensitive method to evaluate the presence of podocin than the ELISA test, whilst selected tryptic peptides of podocin appear to apply to horses. The ELISA test showed greater effectiveness in excluding the disease than in confirming it.

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