

Analysis of marinobufagenin in plasma for preeclampsia risk assessment: a promising early predictive tool

Charline Lenaerts¹, Liz Bond², Robin Tuytten², Bertrand Blankert¹

¹ *Laboratory of Pharmaceutical Analysis, Faculty of medicine and pharmacy, Research Institute for Health Sciences and Technology, University of Mons, Place du Parc 20, 7000 Mons, Belgium. E-mail: charline.lenaerts@umons.ac.be*

² *Metabolomic Diagnostics, Little Island, Cork, Ireland*

Marinobufagenin (MBG) is a bufadienolide compound belonging to the cardiac glycoside class and is present in humans as well as in some plants and other animals. The major source for this compound is located in the parotid and skin gland secretions of some toad species, notably *Bufo Marinus* species.

Endogenous mammalian MBG acts principally as a vasoconstrictive and cardiotoxic compound that inhibits the $\alpha 1$ isoform of Na^+, K^+ -ATPase, resulting in hypertension and natriuresis. The enhanced production of MBG has been described in mammals presenting volume expansion-mediated hypertensive states, notably in preeclamptic patients [1-3]. The elevation of endogenous MBG appears prior the development of the main symptoms of preeclampsia (PE), leading us to consider MBG as a potential biomarker for PE.

Nowadays, a sensitive and accurate analytical method has become indispensable to assess MBG levels in plasma as it is expected to be present in picogram/mL concentrations. A diagnostic threshold value might be established by clinicians in the future, in order to predict the risk for preeclampsia in pregnant women.

A MBG standard compound is currently not commercially available. It forced us to develop an effective extraction and purification method of MBG from freshly collected or crystallized toad *Bufo Marinus* venom. The identity of the compound has been confirmed by different spectral techniques.

Currently, only marinobufagenin-like material has been found in humans using two published quantification methods based each on immunoassays [4, 5]. These techniques suffer from a lack of specificity due to cross-reactivity and tend to exhibit high variability at low concentrations [6].

This condition has led us to authenticate the presence of MBG in humans using a more specific and accessible technique. The research work currently presented deals with the optimization of a LC-MS based assay in order to identify and quantify MBG in human plasma. A pre-extraction procedure is needed to concentrate and clean the sample prior to its analysis. The identification of MBG in non-pregnant healthy volunteers as well as in early pregnancy will be demonstrated, giving the clinicians a promising opportunity to further assess the use of MBG for early preeclampsia risk assessment in pregnant women.

References

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