METABOLIC AND PROTEOMIC ANALYSIS OF SERA FROM SPONTANEOUSLY HYPERTENSIVE RATS TREATED WITH ANGIOTENSIN-I-CONVERTING ENZYME INHIBITORY TRIPEPTIDE GLY-VAL-ARG

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ABSTRACT

It has been reported that angiotensin-I-converting enzyme (ACE) inhibitory tripeptide GVR derived from mycelial protein of *Pleurotus pulmonarius* was able to reduce systolic blood pressure (SBP) in spontaneously hypertensive rats (SHRs). To elucidate the possible action of GVR peptide, proteins and metabolites levels in the sera of untreated and tripeptide GVR treated (100 mg/kg/bw) SHRs were analysed. Twelve differentially expressed protein spots were expressed when silver stained 2D gels were analysed with Progenesis gel analyser. The proteins were identified by QToF-LCMS and they were reported to have direct correlation with hypertension: T-kininogen, carboxylesterase 1C, serum albumin, serotransferrin, zinc-α2-glycoprotein, glial fibrillary acidic protein, clusterin, glutathione peroxidase 3, growth arrest and DNA damage inducible proteins-interacting protein 1, cadherin EGF LAG seven-pass G-type receptor 2 and haptoglobin. These proteins were downregulated in the treated SHRs samples except for serotransferrin and anionic trypsin-1 (p < 0.05). As for metabolomics analysis, significant downregulation of kynurenine, sphinganine, phytosphingosine, uric acid, purine, creatine, and LysoPE (0:0/22:0) were observed after the treatment (p < 0.01). Conversely, upregulation of PE (16:1(9Z)/12:0) and PE (22:4(7Z,10Z,13Z,16Z)/19:0) was detected (p < 0.01). Through these ‘omics’ approaches, the ability of tripeptide GVR to exert its antihypertensive effect was shown and its possible mode of action could be elucidated.