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Hypocholesterolemic and antioxidative properties of Sericin on adrenal secretory granule biosynthesis in hyperlipidemic rats

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Not only liver, heart and kidney architectures are affected by hypercholesterolemia, but adrenal gland is also disturbed in association with imbalance of glucocorticoids secretion leading to increase in the metabolic availability of fatty acids. The secretory cells in adrenal cortex especially located in the zona glomerulosa and zona fasciculata layers, are responsible for glucocorticoids production. Up to date, dysregulation of glucocorticoids biogenesis in hypercholesterolemia is not well understood. However, it has been claimed that aquaporin (AQP)-1 may be involved in regulation of their production and secretion. Recently, our previous studies revealed that sericin ameliorate dysmorphic mitochondria in high blood cholesterol rats through antioxidative property. Therefore, we postulated that sericin may also preserve the biogenesis of secretory cells and stabilize steroid hormone secretion relevant to blood cholesterol level. *In vivo* model of high cholesterol-fed rat was conducted with and without sericin treatment for 30 days. Blood clinical chemistry, histopathological, immunohistochemical, enzyme-linked immunosorbent assay, and transmission electron microscopic studies were performed. The results demonstrated that sericin lowered blood cholesterol and increased high density lipoprotein (HDL) accompanied by increased antioxidative level characterized by serum super oxide dismutase (SOD). Although cellular architecture of secretory cells in adrenal gland was preserved, AQP-1 and SOD expressions on those cells were up-regulated in sericin treated-rats when compared to non-treatment group. These indicated that under antioxidative stress environment affected by sericin, treated-rats were better maintained an AQP-1 level than in those non-treatment group. Interestingly, serum cholesterol had a negative correlation to the level of HDL, serum SOD level and the expression of SOD and AQP-1 in adrenal secreting cells. This can be concluded that hypocholesterolemic and antioxidative properties of sericin maintained adrenal secretory cells biogenesis which reflected to the stability of glucocorticoid production and secretion.

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Biography

Supamas Napavichayanun is a PhD student, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand. She earned a BSc from Faculty of Pharmaceutical Sciences, Chulalongkorn University in 2010. Her research work focuses on silk proteins and biomaterials. She has also done clinical researches in the area of Dermatology, especially in materials for wound healing application.

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