

Effects of silybin, flavonolignans, on catecholamine secretion and tyrosine hydroxylase activity in cultured bovine adrenal medullary cells

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Silymarin, a complex of flavonolignans derived from the seeds of the milk thistle (*Silybum marianum*), is a traditional drug and food supplement employed for numerous liver disorders. Silymarin contains mainly silybin, silichristin, silidianin, isosilybin, and taxifolin. Silybin, the principal flavonoid contained in silymarin, showed antioxidant, anti-inflammatory and anticarcinogenic properties. Adrenal medullary cells, the neuroendocrine arm of the sympathetic nervous system, secrete catecholamine to mediate the physiological response to stress. This study was conducted to investigate the effects of silybin on catecholamine secretion and tyrosine hydroxylase activity in cultured bovine adrenal medullary cells to clarify the influence of silybin on a stress reaction. Silybin suppressed catecholamine secretion and ⁴⁵Ca²⁺ influx induced by acetylcholine (ACh), a physiological secretagogue and agonist of nicotinic ACh receptors, in a concentration dependent manner. Silybin had a little effect on catecholamine secretion induced by 56 mM K⁺. Silybin also suppressed both basal and ACh-induced tyrosine hydroxylase activity. These findings suggest that silybin inhibits catecholamine secretion and tyrosine hydroxylase activity by suppression of nicotinic ACh receptor-ion channels in bovine adrenal medulla cells. Therefore, silybin may be reduce the activity of catecholamine system elevated by stress stimuli.