

メタボリックシンドロームモデルラットにおける 各種分子量キトサンの抗酸化作用および脂質抑制効果の評価

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The antioxidative and antilipidemic effects of different molecular weight chitosans in metabolic syndrome model rats

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ABSTRACT: The effect of high and low molecular weight chitosans (HMC; 1,000 kDa, LMC; 30 kDa) on oxidative stress and hypercholesterolemia was investigated using SHP/ND mc-cp rats as a metabolic syndrome model (MS-rats). In Normal-rats, the ingestion of both chitosans over a 4 week period resulted in a significant decrease in total body weight, glucose, triglyceride, low density lipoprotein and serum creatinine levels. The ingestion of both chitosans also resulted in a lowered ratio of oxidized to reduced albumin and an increase in total plasma antioxidant activity. In addition to similar results in Normal-rats, the ingestion of only HMC over a 4 week period resulted in a significant decrease in total cholesterol levels in MS-rats. Further, the ingestion of LMC resulted in a significantly higher antioxidant activity than was observed for HMC in both rat models. The results obtained suggest that LMC has a high antioxidant activity as well as antilipidemic effects, while HMC results in a significant reduction in the levels of pro-oxidants such as LDL in the gastrointestinal tract, thereby inhibiting the subsequent development of oxidative stress in the systemic circulation in metabolic model rats.

抄録 キトサンの酸化ストレスと高コレステロール血症に対する効果を調べるために、健常ラットとメタボリックシンドロームモデルラット (MS-rat) を用いて検討した。キトサンの4週間摂取による体重、グルコース、LDLの有意な減少とアルブミン酸化度の減少及び抗酸化活性の有意な増加が認められた。また、低分子キトサンの摂取は高分子キトサンに比べて高い抗酸化活性を示した。これらの知見から、MS-ratにおいて低分子キトサンには高い抗酸化作用と高コレステロール血症に対する抑制効果が示唆された。

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