Effects of cocoa extract containing polyphenols and methylxanthines on biochemical parameters of obese-diabetic rats.

ABSTRACT

BACKGROUND: Previous studies have indicated that cocoa extract possesses hypoglycaemic and hypocholesterolaemic properties in streptozotocin-induced diabetic rats. However, there has been limited research on the effects of cocoa extract on obese-diabetic (Ob-db) rats that mimic human diabetes syndrome. Hence this study was initiated to determine the effect of cocoa extract containing polyphenols and methylxanthines on several biochemical parameters, namely glucose level, insulin sensitivity and lipid profiles of Ob-db rats. RESULTS: Intake of cocoa extract supplemented with polyphenols (2.17mg epicatechin, 1.52mg catechin, 0.25mg dimer and 0.13 mg trimer g-1 cocoa extract) and methylxanthines (3.55 mg caffeine and 2.22mg theobromine g-1 cocoa extract) for 4 weeks significantly ($P < 0.05$) reduced the plasma total cholesterol, triglycerides and low-density lipoprotein cholesterol of obese-diabetic rats (Ob-db + cocoa) compared with non-supplemented animals (Ob-db). Short-term (acute) supplementation of cocoa extract significantly ($P < 0.05$) reduced the plasma glucose level at 60 and 90min compared with untreated rats as assessed by the oral glucose tolerance test. However, no significant differences were observed in plasma glucose level, insulin level and insulin sensitivity after chronic (4 weeks) cocoa extract supplementation. CONCLUSION: The results of this study suggest that cocoa extract possesses hypocholesterolaemic properties and can exert a transient glucose-lowering effect but not long-term glucose control.

Keyword: Cocoa extract; Insulin sensitivity; Lipid profiles; Obese-diabetic (Ob-db).