[Effects of berberine on cell proliferation, peroxisome proliferation activated receptor gamma, CAAT/enhancer binding protein mRNA and protein expression in 3T3-L1 pre-adipocytes].

[Article in Chinese]

Source
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Abstract

OBJECTIVE:
To study the effect and mechanism of berberine (BER) on the proliferation and differentiation of adipocytes.

METHODS:
The proliferation of 3T3-L1 pre-adipocytes was detected by XTT method. Lipid droplets accumulated in the cytoplasm of adipocytes in the differentiating process were observed by oil red O staining and quantified by colorimetry. The expressions of peroxisome proliferation activated receptor gamma (PPARgamma), CAAT/enhancer binding protein alpha (C/EBPalpha) mRNA and protein were detected by Real-time PCR and Western blotting respectively.

RESULTS:
Intervention with BER in concentration below 10 micromol/L for 24 h showed insignificant effect on the proliferation of adipocytes, as compared with that in the control group (P > 0.05); but that in concentrations 20, 40 and 80 micromol/L revealed significant suppressive effect; that in different concentrations acting for 48 h and 72 h could affect the proliferation and the effect displayed a dose-dependent manner, i. e. the higher the concentration of BER, the more apparent the suppression, showing
significant difference as compared with those in the control group (P <0.05 or P <0.01). The pre-adipocyte treated with 10 micromol/L BER showed that the lipid droplets in the cytoplasm significantly lessened, so did the expression of differentiation related factor PPAR gamma mRNA as well as the expressions of C/EBPalpha mRNA and protein, as compared with those in the blank control group and the group intervened with rosiglitazone, the difference was significant (P < 0.05 or P < 0.01).

CONCLUSIONS:

BER can suppress the proliferation and differentiation of 3T3-L1 pre-adipocytes, reduce the accumulation of lipid drops in the adipocyte differentiating process, which may be associated with its effects in decreasing the expressions of adipocyte differentiation related gene PPARgamma, C/EBPalpha mRNA and protein. The study provides a basis for applying BER on the prevention and treatment of such metabolic related diseases as obesity.

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