Cell biological mechanism involved in the effect of sodium selenite on improving insulin sensitivity

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OBJECTIVE: To study the cell biological mechanism of sodium selenite improving insulin sensitivity in pubertal rats with insulin resistance.

METHODS: The content of inositol 1,4,5-trisphosphate (IP3) was examined by anion resin chromatography, and mRNA levels of phosphatidylinositol 3-kinase regulatory subunits (PI3Kp85 alpha) and Se-P were detected by RT-PCR in hepatocyte isolated from pubertal rats with insulin resistance. RESULTS: The mRNA levels of Se-P and PI3Kp85 alpha and content of IP3 in isolated hepatocyte decreased in pubertal male rats with insulin resistance. The above indices increased and reached normal level in rats supplied with selenium. The response to insulin stimulation in isolated hepatocyte in rats with selenium supply was similar to that in the control group, and both groups had higher response than those with high-fat diet. Alone when inhibited by wortmannin, the concentration of IP3 increased slightly in rats with selenium supply, but still was lower than that in the control group. CONCLUSIONS: These results indicate that the effect of selenium improving insulin sensitivity may be related to phosphatidylinositol PI3K signalling pathway. The effect of regulation of IP3 by selenium is not as effective as that by insulin, which may explain the difference of effect between selenium and insulin.