The effects of leptin and progesterone on BeWo cell invasion

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Objective

Leptin and progesterone have been suggested to be involved in placentation. In the present work, we studied a possible effect of leptin and progesterone on trophoblastic cell invasion.

Materials and Methods

The potential of cell invasiveness was assessed by transwell invasion assay and cell culture was done with different concentration of leptin (0 ng/ml, 5 ng/ml , 50 ng/ml, 100 ng/ml, and 500 ng/ml) for 48 hrs. Leptin (500 ng/ml) and progesterone with different concentration (0 uM, 2 uM, 20 uM, 200 uM) added to BeWo cell lines and we examined the invasion assay and cell culture. By using RT-PCR, the expression of E-carderin, MMP-9, TIMP-1, and TIMP-2 were detected on cultured BeWo cell.

Results

Leptin could promote BeWo cell invasiveness in a dose-dependant manner. Progesterone inhibite leptin-induced invasion in dose-dependant manner. The expression of MMP-9 and E-carderin were increased by leptin. The expression of MMP-9, E-carderin , and TIMP1 were decreased by progesterone.

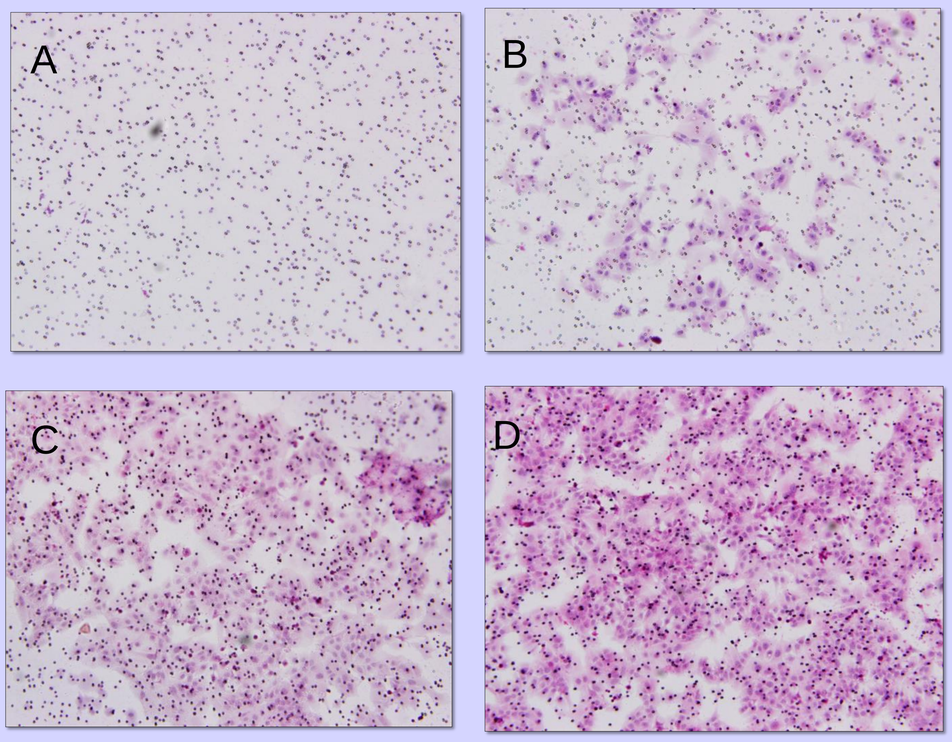

Figure 1. The effect of leptin on BeWo cell**.** Leptin could promote BeWo cell invasiveness in a dose-dependant manner. **A.** Transwell invasion assay were in the absence of leptin. **B**. in presence of leptin (5 ng/mL) C. in presence of leptin (50 ng/mL) D. in presence of leptin (500 ng/mL)

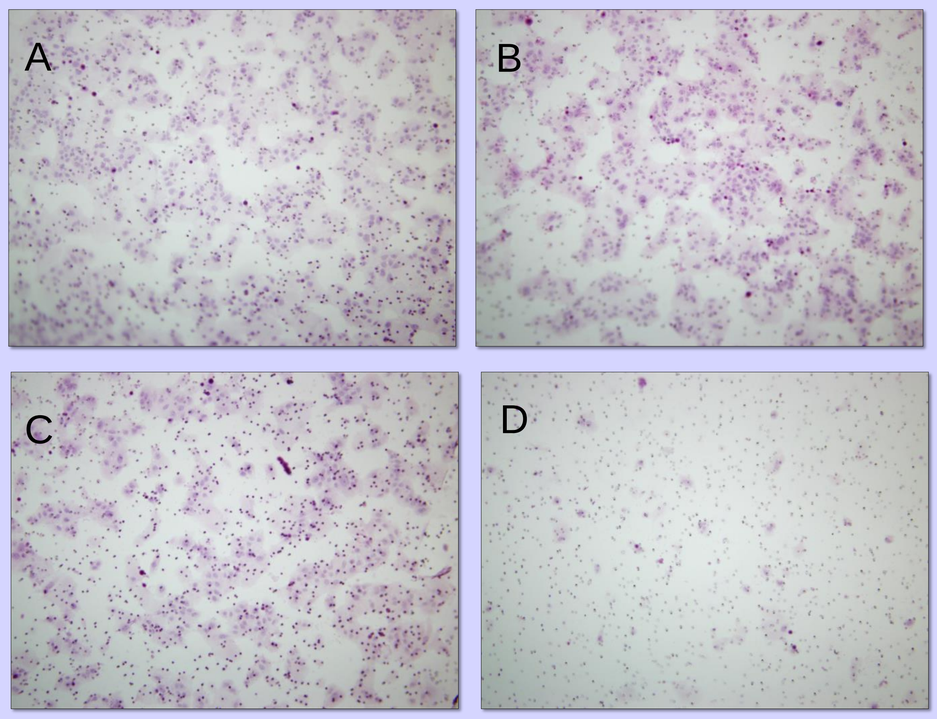

Figure 2. The effect of leptin and progesterone on BeWo cell. Progesterone inhibite leptin-induced invasion in dose-dependant manner.
A. Transwell invasion assay were in the Leptin (500 ng/ml) and absence of progesterone. B. in the Leptin (500 ng/ml) and progesterone 2uM.
C. in the Leptin (500 ng/ml) and progesterone 20uM
D. in the Leptin (500 ng/ml) and progesterone 200uM

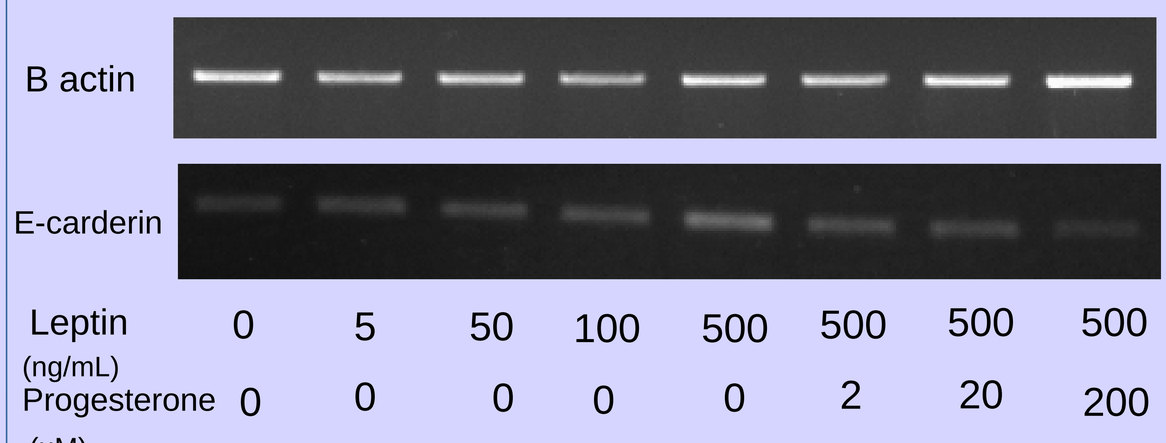

Figure 3. The RT-PCR results shows that the expression of E-carderin were increased by leptin and decreased by progesterone.

Figure 4. The RT-PCR results shows that the expression of MMP-9 were increased by leptin and decreased by progesterone.

Conclusions

We conclude that leptin promote BeWo cell invasion by MMP-9 and E-carderin. Progesterone inhibite leptin-induced invasion by block of MMP-9, E-carderin , and TIMP1.