

Effect of in vivo administration of epidermal growth factor on prostaglandin production and NOS activity in term rat placentae. Possible participation of placental EGF receptors

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Abstract

Many authors hypothesize that the epidermal growth factor (EGF) is involved in the onset of labor. Previous reports from our laboratory showed that intrauterine administration of EGF delays the beginning of labor. The aims of this study were: 1) to analyze the effect of intrauterine administration of 500 ng EGF on placental prostaglandins and nitric oxide, and 2) to characterize the expression of EGF receptors (EGF-R) in pregnant rat placentae. Saline solution (sham group) and 500 ng EGF (EGF-treated group) were administered via intrauterine injection on day 21 of gestation, and both groups of animals were sacrificed on day 22 (sham rats delivered on day 22). Results showed that EGF treatment: 1) inhibited the production of prostaglandin E ($p < 0.001$) and F(2 α) ($p < 0.01$), 2) increased the synthesis of nitric oxide ($p < 0.001$), and 3) reduced the expression of cyclooxygenase-II, the enzyme responsible for PG synthesis. Placentae were found to express EGF-R and its activated form, and the expressions of both forms were higher at mid and term pregnancy. Hence, EGF is a very interesting molecule for studying the regulation of placental prostaglandin and nitric oxide production related to the parturition process.