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Association between maternal and amniotic fluid cortisol is moderated by maternal anxiety.

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Maternal stress or anxiety during pregnancy can lead to neurodevelopmental and other problems in the child, and cortisol is one possible mediator. Animal models show that maternal prenatal stress can affect placental function, including regulation of placental 11beta-HSD2, the main barrier to the placental passage of cortisol. It is not known whether a parallel process exists in humans. The aim of the current study was to determine whether maternal anxiety increases the association between maternal plasma cortisol and amniotic fluid cortisol. The sample consisted of 262 women having amniocentesis, with normal pregnancies, who completed Spielberger State and Trait anxiety scales, from whom a plasma sample and an aliquot of amniotic fluid was obtained. The correlation between maternal and amniotic fluid cortisol was strongly dependent on both State and Trait maternal anxiety; in the most anxious State quartile $r(62) = .59$, $p < .001$ and in the least $r(60) = .05$, ns, a significant difference ($p < .0015$). The moderating effect of maternal anxiety on the association between maternal plasma and amniotic fluid cortisol remained when gestational age, maternal age, fetal sex, medication and time of collection were controlled for. There was no difference in amniotic fluid cortisol levels between the most and least anxious groups of mothers. However, the finding that there is a stronger correlation between maternal and fetal cortisol among more anxious pregnant women does suggest that the maternal emotional state can affect the function of the placenta.