COMMENTARY

Morning sickness is just the side effect of a new tachykinin that the placenta secretes to improve local blood flow

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Although morning sickness is very unpleasant, the ‘old wives’ tale’ that it results in a healthy baby has now a credible scientific explanation.

The tachykinins are an ancient family of important biologically active peptides that are usually restricted to neural tissue and have a variety of effects on the vasculature and the immune and endocrine systems, but they can also cause nausea and vomiting (Steinhoff *et al.* 2014). The tachykinin, endokinin, is expressed in many tissues throughout the body including the placenta and lung and in tumor cell lines derived from these tissues (Page *et al.* 2003). Thus, as its name suggests, it can behave as an endocrine hormone by being released into the blood stream. As the naturally secreted form of endokinin has been found in the placenta (Page *et al.* 2003), it would stimulate local tachykinin receptors to improve blood flow both in the placenta and uterus and may be involved in the further integrating vascularization that is important for efficient transfer of nutrients and gases. Unfortunately, this placental endokinin will also spill into the mother’s general circulation that would then stimulate the tachykinin receptors in the brain (Andrews & Rudd 2004) that are known to cause nausea/vomiting.

In a recent preliminary report, after the inhalation of tobacco smoke, endokinin concentrations in blood of a non-smoker increased nearly 30-fold (Vaiyapuri *et al.* 2017). Thus, the nausea experienced by the inhalation of smoke would appear to be due to endokinin being released from the lung into the bloodstream that then circulates stimulating the same receptors in the brain, that placental endokinin does in causing morning sickness.

It is well known that smoking in pregnancy leads to poor placentation, fetal distress and post-partum

problems (Abel 1980). Thus, it is feasible that the regular release of lung endokinin into the mother’s blood from smoking affects the very endokinin receptors in the uterus and placenta that are needed to be stimulated by placental endokinin to ensure a healthy pregnancy. There are maybe two possible explanations how this results in poor placentation: either the constant stimulation leads to downregulation of local tachykinin receptors such that they respond poorly to placental endokinin or high lung endokinin concentrations in uterine blood disrupts the local concentration gradient of placental endokinin that is necessary for the correct directional growth of the spiral arteries in the small finger like projections that ensure a healthy placentation at the placental/uterine interface.

Similarly, drugs that block the effects of endokinin at its receptor should be avoided to treat morning sickness as they would also block the local beneficial effects of placental endokinin.

In conclusion, it is hoped that this short commentary will give some psychological relief to pregnant ladies suffering from morning sickness but will also persuade smokers who are intending to have a baby to kick the habit well beforehand.

Declaration of interest

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