

Editorial

Intergenerational transfer of perinatal trauma-related consequences

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Women experiencing traumatic events during pregnancy that are related to their pregnancy (e.g., pregnancy loss) or not (e.g., natural disaster) may develop posttraumatic stress disorder (PTSD). PTSD is a highly distressing condition with symptoms of re-experiencing, avoidance, negative cognitions and mood, hyperarousal, as well as social and professional dysfunction (American Psychiatric Association, 2013). If mothers perceive their childbirth as a threat to their life and/or that of their baby, they are at risk of postpartum PTSD (ppPTSD; Horsch & Ayers, 2016). PTSD following childbirth affects approximately 3-4% in community samples and approximately 18-19% of women in high-risk groups, e.g., those who had a preterm birth or an emergency cesarean section (Yildiz, Ayers, & Phillips, 2017). It is noteworthy that history of PTSD may increase the mother's risk of ppPTSD. It is currently unknown whether pre-partum PTSD increases the risk of ppPTSD. However, given the evidence of risk between pre-partum and post-partum anxiety and depression, it is likely that this is also the case for pre- and post-partum PTSD.

The negative impact of ppPTSD extends beyond the mother, also affecting the couple and their child. A systematic review of associations between ppPTSD and child outcomes found consistent evidence with lower birth weight, but inconsistent evidence of an association between ppPTSD and child development (cognitive development, sleeping and eating; Cook, Ayers, & Horsch, 2018). These studies demonstrate a transfer of trauma-related consequences from the mother to her child. Regarding this transfer in the perinatal period, it is important to distinguish different pathways and mechanisms by which this occurs, as this might point to different avenues and time points for (early) interventions.

According to Bowers and Yehuda (2016), intergenerational transfer refers to an observed change in offspring as a consequence of a biological change in the parent that occurred in response to a traumatic event. This transfer from parent to child can occur through three different pathways: (1) preconception, where stress exposure influences the sperm, egg and thus the gamete; (2) during pregnancy through the in-utero environment; and (3) through early postnatal care (Bowers & Yehuda, 2016).

The second pathway relates to the effects of pre-partum PTSD on the unborn child. So far, most evidence in humans exists for this path (Bowers & Yehuda, 2016). Despite some negative findings, there is substantial evidence that stress exposure during pregnancy influences infant outcomes. An increased risk of early delivery, preterm birth, and lower birthweight for gestational age has been described (Glover, O'Donnell, O'Connor, & Fisher, 2018; Van den Bergh et al., 2017), as well as an increased future risk for mental health disorders, including anxiety, depression, attention deficit and hyperactivity disorder, and schizophrenia (Van den

Bergh et al., 2017). It is thought that stress during pregnancy has its influence through fetal programming, whereby biological signals from the mother, including those altered by stress, affect fetal brain development (Glover et al., 2018). Researchers have investigated different biological mechanisms of this programming including: HPA axis and cortisol, placental functioning, microbiome, maternal immune functioning, and cytokines (see for reviews: Glover et al., 2018; Monk, Lugo-Candelas, & Trumpff, 2019).

The third pathway of intergenerational transfer focuses on trauma-related maternal biological changes following childbirth that impact on the early postpartum care, consequently altering infant biological and developmental outcomes. This pathway is suited to help understand the impact of maternal ppPTSD-related sequelae on infant outcomes. To delineate the effects specific to this pathway, it is essential to control for in-utero stress exposure and past stress and trauma exposure, as well as past PTSD (including pre-partum PTSD) of the mother. Recent prospective studies were designed to control for these variables and have shown evidence for this pathway. For example, two large prospective cohort studies found associations between maternal ppPTSD symptoms and infant troubled sleep at 2 years (Garthus-Niegel et al., 2018) and poor child social-emotional development at 2 years (Garthus-Niegel, Ayers, Martini, von Soest, & Eberhard-Gran, 2017). However, research understanding the underlying physiological mechanisms of this third pathway is needed.

We propose that this pathway offers a unique opportunity to investigate the role of the father. The intergenerational transfer of the father to his infant in the postpartum period may occur in a similar way as for the mother because fathers can also suffer from ppPTSD (Horsch et al., 2017). In addition, intergenerational transfer may take place through an indirect pathway where both parents have the potential to influence each other's emotion and stress regulation, nutrition, sleep, and other relevant biological mechanisms. In turn, these factors may also influence family relationships, parenting and other variables related to early postpartum care. Studies investigating the intergenerational transfer of *both* parents following childbirth are therefore needed to fully understand this pathway.

Intergenerational transfer taking place through the early postpartum parenting environment is of strong interest to psychologists, as there are potential modifiable factors that psychological interventions can help with. Intervening early before parental biological changes significantly interfere with aspects of early parenting, such as parent-infant bonding and parental sensitivity, may help to interrupt or alter the course of the intergenerational transfer. This provides an opportunity to positively influence not just the parents' life but also that of their child. Broader than this, we may be able to reduce the current economic burden of perinatal

mental health currently estimated in the UK to be £8.1 billion, with 72% attributable to the child rather than the mother (Bauer, Parsonage, Knapp, Lemmi, & Adelaja, 2014).

References

- American Psychiatric Association. (2013). *Diagnostic Manual of Mental Disorders (5th ed.)*. Arlington, VA American Psychiatric Publishing.
- Bauer, A., Parsonage, M., Knapp, M., Lemmi, V., & Adelaja, B. (2014). Costs of perinatal mental health problems.
- Bowers, M. E., & Yehuda, R. (2016). Intergenerational Transmission of Stress in Humans. *Neuropsychopharmacology*, *41*(1), 232-244. doi:10.1038/npp.2015.247
- Cook, N., Ayers, S., & Horsch, A. (2018). Maternal posttraumatic stress disorder during the perinatal period and child outcomes: A systematic review. *J Affect Disord*, *225*, 18-31. doi:10.1016/j.jad.2017.07.045
- Garthus-Niegel, S., Ayers, S., Martini, J., von Soest, T., & Eberhard-Gran, M. (2017). The impact of postpartum post-traumatic stress disorder symptoms on child development: a population-based, 2-year follow-up study. *Psychol Med*, *47*(1), 161-170. doi:10.1017/S003329171600235X
- Garthus-Niegel, S., Horsch, A., Bickle Graz, M., Martini, J., von Soest, T., Weidner, K., & Eberhard-Gran, M. (2018). The prospective relationship between postpartum PTSD and child sleep: A 2-year follow-up study. *Journal of Affective Disorders*, *241*, 71-79. doi:10.1016/j.jad.2018.07.067
- Glover, V., O'Donnell, K. J., O'Connor, T. G., & Fisher, J. (2018). Prenatal maternal stress, fetal programming, and mechanisms underlying later psychopathology-A global perspective. *Dev Psychopathol*, *30*(3), 843-854. doi:10.1017/S095457941800038X
- Horsch, A., Jacobs, I., Gilbert, L., Favrod, C., Schneider, J., Morisod Harari, M., & Bickle Graz, M. (2017). Impact of perinatal asphyxia on parental mental health and bonding with the infant: a questionnaire survey of Swiss parents. *BMJ Paediatr Open*, *1*(1), e000059. doi:10.1136/bmjpo-2017-000059
- Monk, C., Lugo-Candelas, C., & Trumpff, C. (2019). Prenatal Developmental Origins of Future Psychopathology: Mechanisms and Pathways. *Annu Rev Clin Psychol*. doi:10.1146/annurev-clinpsy-050718-095539
- Van den Bergh, B. R. H., van den Heuvel, M. I., Lahti, M., Braeken, M., de Rooij, S. R., Entringer, S., . . . Schwab, M. (2017). Prenatal developmental origins of behavior and mental health: The influence of maternal stress in pregnancy. *Neurosci Biobehav Rev*. doi:10.1016/j.neubiorev.2017.07.003

Yildiz, P. D., Ayers, S., & Phillips, L. (2017). The prevalence of posttraumatic stress disorder in pregnancy and after birth: A systematic review and meta-analysis. *J Affect Disord*, 208, 634-645. doi:10.1016/j.jad.2016.10.009