

Brief report on neurodevelopmental disorders

[Psychology](#), [Psychotherapy](#)



Neurodevelopmental disorders (NDs) play an important role in our society due to the increasing prevalence (Boyle et al. , 2011; Environmental Protection Agency, 2017). NDs include various severe symptoms like cognitive, motor, social, affective and language disturbances and thereby strongly restrict a patient's daily life (Homberg et al. , 2016). It is a heterogeneous group of psychiatric illnesses and encompass communication disorders, attention deficit hyperactivity disorders (ADHD), autism spectrum disorders (ASD), bipolar disorder (BD), obsessive-compulsive disorder (OCD) and schizophrenia (SCZ) (Homberg et al. , 2016; Rosenberg and Keshavan, 1998). Early life is a sensitive period and therefore disruptions in early brain development lead to NDs (Bale et al. , 2010; Boivin et al. , 2015).

Research directed to unravel factors contributing to the emergence of NDs which is necessary for the development of new preventive strategies and therapies. It has been recognized that both genetic and environmental perturbations could serve as risk factors (Boivin et al. , 2015). Thereby, many candidate-genes which are involved in different forms of NDs have been identified (Hu et al. , 2014; van Loo and Martens, 2007). In addition to genetic contributions, various environmental conditions are known to be important key-factors in the occurrence of NDs. Especially the maternal nutritional, psychological and physiological status has an enormous effect on the embryonic brain development as recent findings demonstrated (Kofink et al. , 2013; Lyall et al. , 2014; Monk et al. , 2012; O'Donnell et al. , 2014; Tsuchiya et al. , 2003). Moreover, these maternal conditions do not only have an influence on the neural development of the offspring pre- and postnatal but also influence the development prior to conception (Kesmodel

et al. , 2015; Knudsen et al. , 2014; Kofink et al. , 2013; Monk et al. , 2012).

Whereas genetic factors can be poorly controlled, environmental factors seem to be a promising target to develop preventive strategies and thereby potentially reducing the occurrence of NDs. One maternal-related environmental risk factor is stress during and even prior to pregnancy which has been shown to alter normal brain functioning in the progeny (Kofink et al. , 2013; Li et al. , 2010; Lupien et al. , 2009).

Recent animal studies reported that pre-reproductive (before copulation) maternal stress lead to altered affective and social behavior as well as depression-like symptoms in the offspring (Li et al. , 2010; Shachar-Dadon et al. , 2009). Additional to aberrant behavior, the progeny of female rats which were exposed to stress prior to copulation exhibited various neuropathologies like changes in neuronal morphology and alterations in the hypothalamus-pituitary-adrenal (HPA) axis (Bock et al. , 2016; Zaidan and Gaisler-Salomon, 2015; Zaidan et al. , 2013).