White Matter Connectivity Differences in Face Processing Cortical Brain Network Between Preterm and Term Born Neonates

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Neonates have a tendency to orient towards faces as noted by various researchers. This behaviour is facilitated by the inherent cortical pathway which starts to develop from the 28th gestational week and continues until adulthood. However, infants born preterm are predisposed towards neurodevelopmental impairments like developmental prognosia and autism. To study this phenomenon, Diffusion Tensor Imaging (DTI) data of neonates was taken from the developmental human connectome project (dHPC) and the Edinburg Neonatal Atlas (ENA) atlas was used to extract the regions of interest (ROI) from standard space. The major ROIs were fusiform face area (FFA), occipital fusiform area (OFA), posterior superior temporal sulcus (PSTS) and primary visual pathway (V1). The aim of he study was to create a pipeline to process neonatal DTI to extract the probabilistic tractography of the ROIs. The second aim was to see whether preterm birth and gender effects the white matter quality of the face processing fiber tracts. The results generated from the study did not reveal any significant differences in the quality of WM cortical fiber tracts as a result of preterm birth or gender. This could be a result of low sample size or the lack of well parcellated neonatal atlases with precise cortical regions, which could also be the focus of future research.