Appendix D

Overview of other MRI-TEA scoring systems

- Leijser et al. created a scoring system used by Burkit et al., which has three different WMI classifications (normal, moderate, severe) focusing on 1) the homogeneous high signal intensity at T2W- images within periventricular zone and/or subcortical WM, 2) the punctate WM lesions (PWML) and 3) the lateral ventricles volume and sizes (Leijser et al., 2010).
- Brembilla et al. used the total maturation score (TMS) and the 2D area determination aside (Brembilla et al., 2021). The TMS evaluates four morphological parameters: myelination, cortical folding, germinal matrix distribution and glial cell migration pattern. With 2D area determination were the following areas measured: the inner calvarium, the cerebral parenchyma, the cerebellar hemispheres and the cerebellar vermis.
- Sheng et al., but also other studies, used the papile et al. (1978) grading system for intraventricular haemorrhages (IVH). Sheng et al. also used the Guo et al. (2017) classification method for WMI classification. It classifies abnormal T1 shortening and/or cystic degeneration. (Sheng et al., 2022)
- Parikh et al. used a qualitative methodology focusing on the diffuse white matter abnormality (DWMA), which is testing similar parameters as Leijser et al. (2018). It focuses on diffuse excessive high signal intensity (DEHSI) or described at Leijser with the homogeneous high signal intensity at T2W- images within the periventricular zone and/or subcortical WM. (Parikh et al., 2020)
- Logan et al. used an automated developing Human Connectome Pipeline (dHCP) to detect cortical maturation ((surface area, sulcal depth, gyrification index and curvature) (Logan et al., 2021).
- Dewan et al. used a quantitative analysis and a qualitative analysis (Dewan et al., 2019). The quantitative analysis used different metric parameters of brain growth, like increased biparietal width (BPW), interhemispheric distance (IHD) and reduced trans cerebellar diameter (TCD). The qualitative analysis is applied by using Kidokoro's scoring system.
- Ayed et al. used the Papile scoring system for IVH but another scoring model of Miller to classify WMI (Ayed et al., 2022). This model classified the images into mild WMI (<3 areas of abnormal T1 signal intensity), moderate (>3 areas of abnormal T1 signal intensity and <5% hemi-spheric involvement), and severe (>5% of the hemisphere involved).

References

Ayed, M., Ahmed, J., More, K., Ayed, A., Husain, H., AlQurashi, A., & Alrajaan, N. (2022). Antenatal Magnesium Sulfate for Preterm Neuroprotection: A Single-Center Experience from Kuwait Tertiary NICU. *Biomedicine Hub*, *7*(2), 80–87. https://doi.org/10.1159/000525431

Brembilla, G., Righini, A., Scelsa, B., Lista, G., Balestriero, M., Cesari, E., Castoldi, F. M., di Stasi, M., Ciardi, C., Ligato, E., Taricco, E., & Cetin, I. (2021). Neuroimaging and neurodevelopmental outcome after early fetal growth restriction: NEUROPROJECT—FGR. *Pediatric Research*, *90*(4), 869–875. https://doi.org/10.1038/s41390-020-01333-1

Dewan, M. V., Herrmann, R., Schweiger, B., Sirin, S., Müller, H., Storbeck, T., Dransfeld, F., Felderhoff-Müser, U., & Hüning, B. (2019). Are Simple Magnetic Resonance Imaging Biomarkers Predictive of Neurodevelopmental Outcome at Two Years in Very Preterm Infants? *Neonatology*, *116*(4), 331–340. https://doi.org/10.1159/000501799

Leijser, L. M., de Bruïne, F. T., van der Grond, J., Steggerda, S. J., Walther, F. J., & van Wezel-Meijler, G. (2010). Is sequential cranial ultrasound reliable for detection of white matter injury in very preterm infants? *Neuroradiology*, *52*(5), 397–406. https://doi.org/10.1007/s00234-010-0668-7

Logan, J. W., Tan, J., Skalak, M., Fathi, O., He, L., Kline, J., Klebanoff, M., & Parikh, N. A. (2021). Adverse effects of perinatal illness severity on neurodevelopment are partially mediated by early brain abnormalities in infants born very preterm. *Journal of Perinatology*, *41*(3), 519–527. https://doi.org/10.1038/s41372-020-00854-1

Parikh, N. A., He, L., Priyanka Illapani, V. S., Altaye, M., Folger, A. T., & Yeates, K. O. (2020). Objectively Diagnosed Diffuse White Matter Abnormality at Term Is an Independent Predictor of Cognitive and Language Outcomes in Infants Born Very Preterm. *Journal of Pediatrics*, *220*, 56–63. https://doi.org/10.1016/j.jpeds.2020.01.034

Sheng, M., Guo, T., Mabbott, C., Chau, V., Synnes, A., de Vries, L. S., Grunau, R. E., & Miller, S. P. (2022). Ventricular Volume in Infants Born Very Preterm: Relationship with Brain Maturation and Neurodevelopment at Age 4.5 Years. *Journal of Pediatrics*, *248*, 51-58.e2. https://doi.org/10.1016/j.jpeds.2022.05.003