Transient Patterns of Organization of the Human Fetal Brain

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Fetal development of the human brain is characterized by continuous transformations and reorganization of the fetal telencephalic wall which consists of transient, cytoarchitectonically defined cellular compartments, the so-called embryonic/fetal zones. The cellular and fiber content of these zones is permanently changing, so that fetal neuronal circuitry elements (afferent fibers, synapses, and postsynaptic neurons) display transient patterns of areal, laminar, and modular organization. In the late human fetus and preterm infant, transient patterns of structural and physiological organization form the basis of transient behavioral states and patterns of activity. The transient subplate zone is a key compartment for transient fetal neuronal circuitry, and competitive cellular interactions within the subplate zone are crucial for the areal specification of the cerebral cortex and the formation of cortical connectivity. The subplate zone may also have a key role in cortical repair and plasticity after perinatal brain lesions.

Key words: brain; human development; infant, premature; neocortex; neural pathways; plasticity, neuronal

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