Background

The septum pellicudum (SP) is a midline limbic structure that divides the lateral ventricles between the corpus callosum and fornix. Cavum septi pellucidi (CSP) is a relatively common neurodevelopmental variant in which the laminae of the SP do not fuse completely. Large CSP, small hippocampus, and fornix abnormalities have all been reported in schizophrenia (SZ) and related disorders, and are likely associated with alterations in neurodevelopment.

Results

CSP measures did not differ between diagnostic groups, although due to the small sample size and rarity of CSP abnormalities a Type II error cannot be precluded. SP length relative to ICC was significantly larger in SZ than NC (p<0.03). In SZ, fornix FA showed trend-level positive correlation with CSP size and a significant negative correlation with SP length (p<0.01). Also in SZ, right hippocampus volume correlated positively with CSP size (p<0.05), and bilateral hippocampus volume correlated negatively with SP length (p<0.01). There were no such correlations in controls.

Conclusions & Further Directions

- Increased prevalence of CSP has been robustly reported in SZ-spectrum disorders. However, functional and neurodevelopmental implications (primary/secondary) and morphology of CSP abnormalities aren't well understood.
- This is in part due to the small size of the SP, which is subject to significant partial volume confounds even with the strongest magnets and best sequences. Also, the human SP remains something of an enigma in basic neuroscience. However, divergent and vaguely-delimited methodologies plaguing the field.
- Recent research has begun to explore the detailed morphology and linear parameters of CSP. Nopoulos and colleagues’ (1998) cited method involved classifying CSP as having “normal” or “abnormal” length. Born and colleagues (2004) measured CSP as a percentage of SP length. Filippovic and Testafiori-Paparad (2004) suggest both CSP and length as predictive aspects of symptomatic cavum, while Galazar and colleagues (2004) suggest three categories corresponding to embryonic stages, delineating “severity” rather than “abnormality.”
- Each of these methods for measurement and interpretation are valid for different reasons, but with some exceptions, little has been done to reconcile disparate reports or to go beyond passive observation.
- Correlations between SP abnormalities and the temporal lobe have been examined. (Dickey et al., 2007; Kwon et al., 1998; Galazar et al., 2004), but relationships to midline structures haven’t been explored thoroughly.
- The present study is limited by a SZ sample with relatively small CSP. We found new relationships between the septum pellicudum and schizophrenia. Post-mortem, MRI, and DTI methods should be utilized on larger samples to begin understanding the relevance of midline structures to schizophrenia spectrum disorders and related pathophysiology.

References