

## Publication

## Can Cortical Thickness Asymmetry Analysis Contribute to Detection of At-Risk Mental State and First-Episode Psychosis?: A Pilot Study

**JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 1196985**Author(s)** Haller, Sven; Borgwardt, Stefan J.; Schindler, Christian; Aston, Jacqueline; Radue, Ernst W.; Riecher-Roessler, Anita**Author(s) at UniBasel** [Borgwardt, Stefan](#) ; [Radü, Ernst-Wilhelm](#) ; [Riecher-Rössler, Anita](#) ; [Schindler, Christian](#) ;**Year** 2009**Title** Can Cortical Thickness Asymmetry Analysis Contribute to Detection of At-Risk Mental State and First-Episode Psychosis?: A Pilot Study**Journal** Radiology**Volume** 250**Number** 1**Pages / Article-Number** 212-221

**PURPOSE:** To investigate whether cortical thickness analysis in individuals with an at-risk mental state (ARMS) might contribute to early detection of psychosis. **MATERIALS AND METHODS:** Ethics committee approval and written informed consent were obtained. Cortical thickness was analyzed because early disease-related morphometric changes were expected to be most pronounced in the cerebral cortex. With the assumption of progressive change in cortical thickness from control subjects, to those with an ARMS, and then to those who have had a first episode (FE) of psychosis, the brain regions that substantially differ between those with FE psychosis and control subjects were identified. Whether these regions help discriminate between the ARMS group and control subjects was tested. Because normal interindividual variation of cortical thickness, even for control subjects, may exceed that expected with early disease-related changes, intraindividual cortical thickness asymmetry was analyzed. Twenty age- and sex-matched individuals for each group (ARMS group, FE group, and control subjects) were recruited within a prospective early-detection study. High-spatial-resolution magnetization-prepared rapid gradient-echo magnetic resonance (MR) brain images were acquired with a 1.5-T MR imager. Cortical thickness asymmetry was analyzed in 41 anatomic regions corresponding to the Talairach standard brain atlas. **RESULTS:** Direct cortical thickness analysis did not help distinguish between groups. Cortical thickness asymmetry analysis helped distinguish between groups ( $P = .007$ ); variability increased from control subjects, to the ARMS group, and then to the FE group in seven anatomic regions ( $P > .0001$ ). Cortical thickness asymmetry in these regions helped distinguish the FE group from control subjects ( $P = .0006$ ; sensitivity, 70.0%; specificity, 85.0%) and showed a trend toward helping to distinguish the ARMS group from control subjects ( $P = .06$ ; sensitivity, 75.0%; specificity, 65.0%). **CONCLUSION:** Cortical thickness asymmetry analysis is more accurate than direct cortical thickness measurement in distinguishing the control from the FE group and might contribute to early detection of an ARMS.

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