

**The “Preliminary Evidence”
is no longer preliminary**

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and the rest of the UW FADU team

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The “preliminary finding” (thank you, Charlie G.)

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Preliminary evidence that prenatal alcohol damage may be visible in averaged ultrasound images of the neonatal human corpus callosum

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Abstract

Brain damage consequent to prenatal alcohol exposure can be detected by measurements of the corpus callosum in the midline magnetic resonance (MR) brain image in adolescents and adults. The present article extends this finding into the neonatal period, when the power of detection to ameliorate the quality of the child's future life is greatest. The midline corpus callosum of the very young infant can be located reliably in multiple frames of clinical transfontanelle ultrasound. We studied a sample of 18 children aged 17 weeks or less, 7 of whom were exposed to high levels of alcohol prenatally and 11 of whom were not exposed or only minimally exposed. The midline callosum of each child was imaged up to 50 times by a standard clinical device, and coplanar subsets of these series were averaged with reference to fiducial image structures. On each average image four semilandmark points were set and their configuration quantified by standard landmark methods. The angle between the terminal bulb of splenium and the long axis of the callosal outline classifies four of the seven exposed infants as different from all 11 of the unexposed infants. This simple angle measurement upon averaged ultrasound images of the human neonatal midline corpus callosum, perhaps a version of the long-sought “biomarker of prenatal alcohol damage,” may be able to discriminate baby brains affected by prenatal alcohol exposure from those that were unaffected. © 2005 Elsevier Inc. All rights reserved.

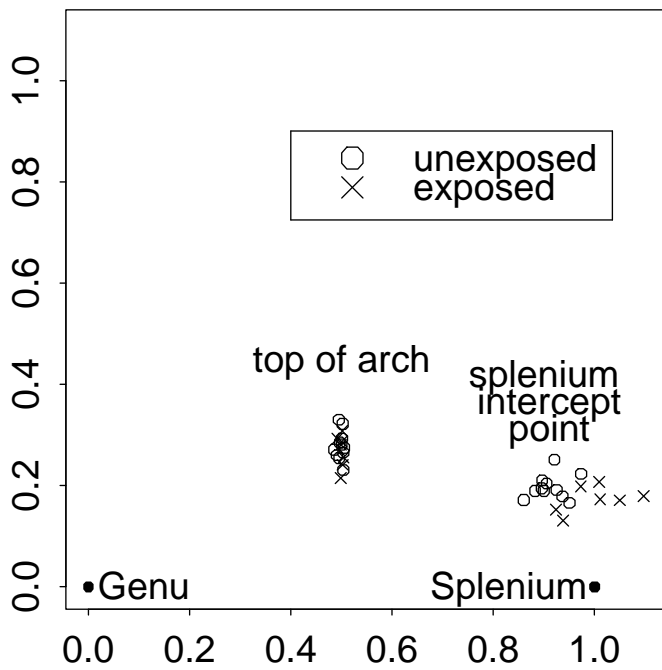
Keywords: Fetal Alcohol Spectrum Disorders; Corpus callosum; Neonatal ultrasound; Unwarped image averaging; Shape coordinates; Splenium



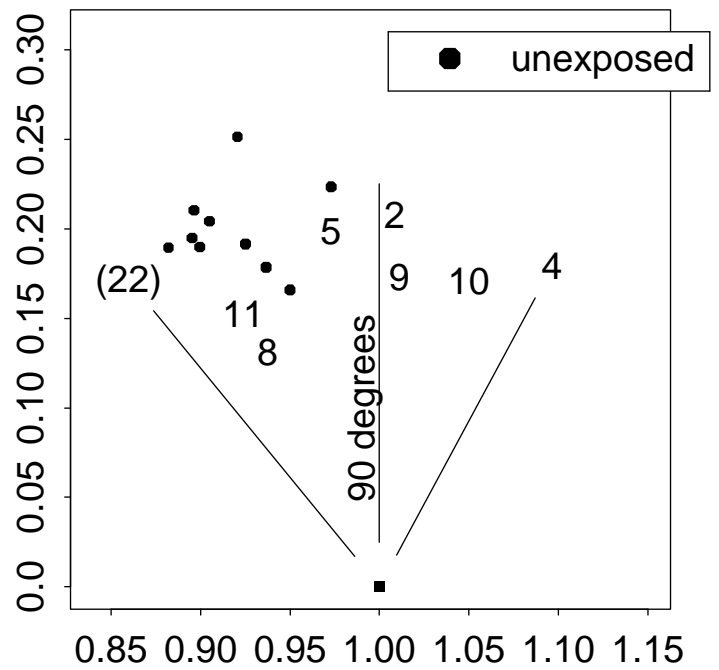
a simple four-point digitizing scheme

The previously published finding:

four points from averaged outlines

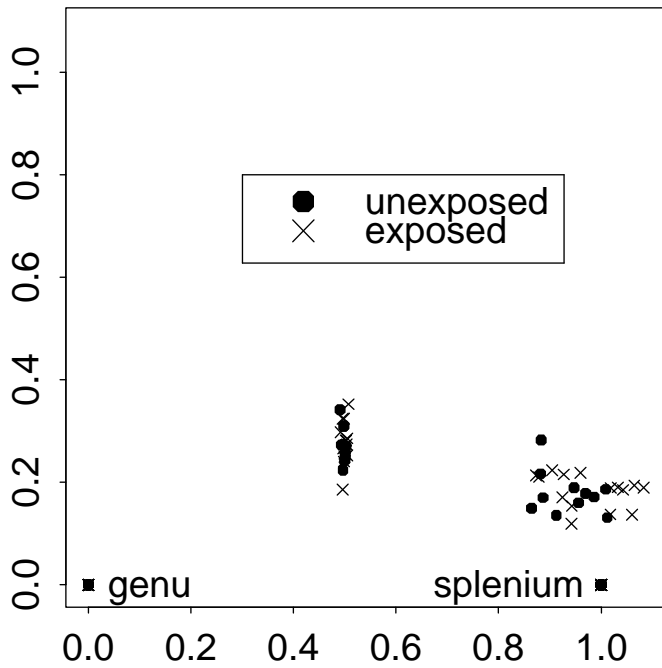


splenium intercept point only

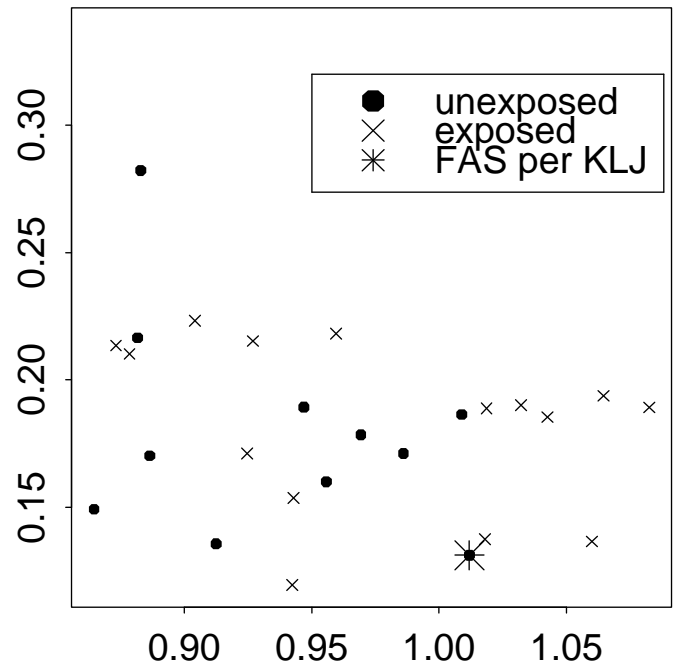


The replicate finding:

four characteristic points



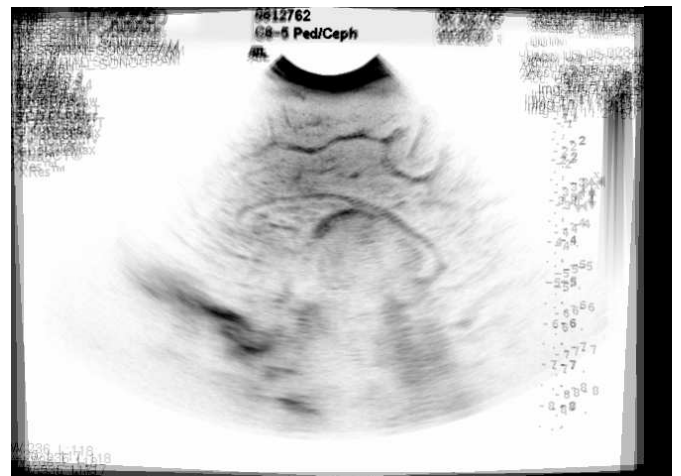
angle-of-splenium point



Two forms of the largest angle



20056 exposed

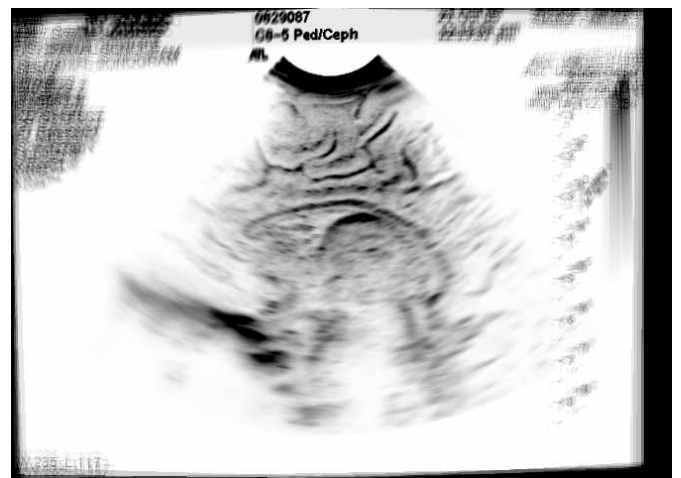


20060 exposed

Two interesting special cases

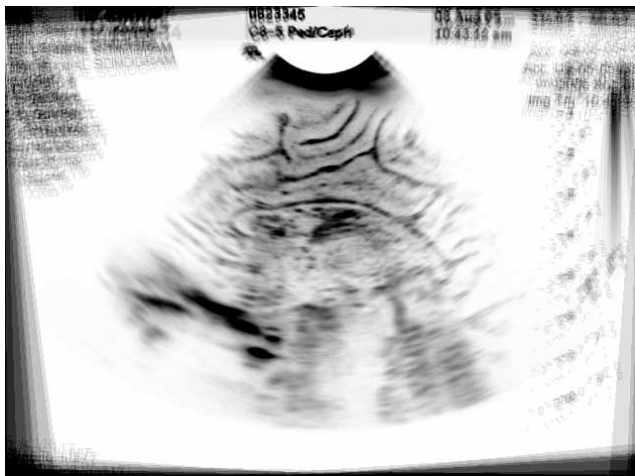


20032 FAS per KLJ

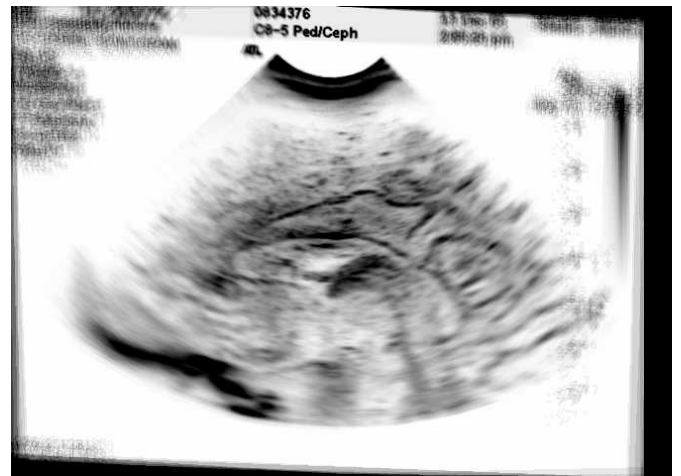


20066 false positive

Two typical unexposed cases



20064 unexposed



20074 unexposed

angle-of-splenium point:
the data sets pooled

