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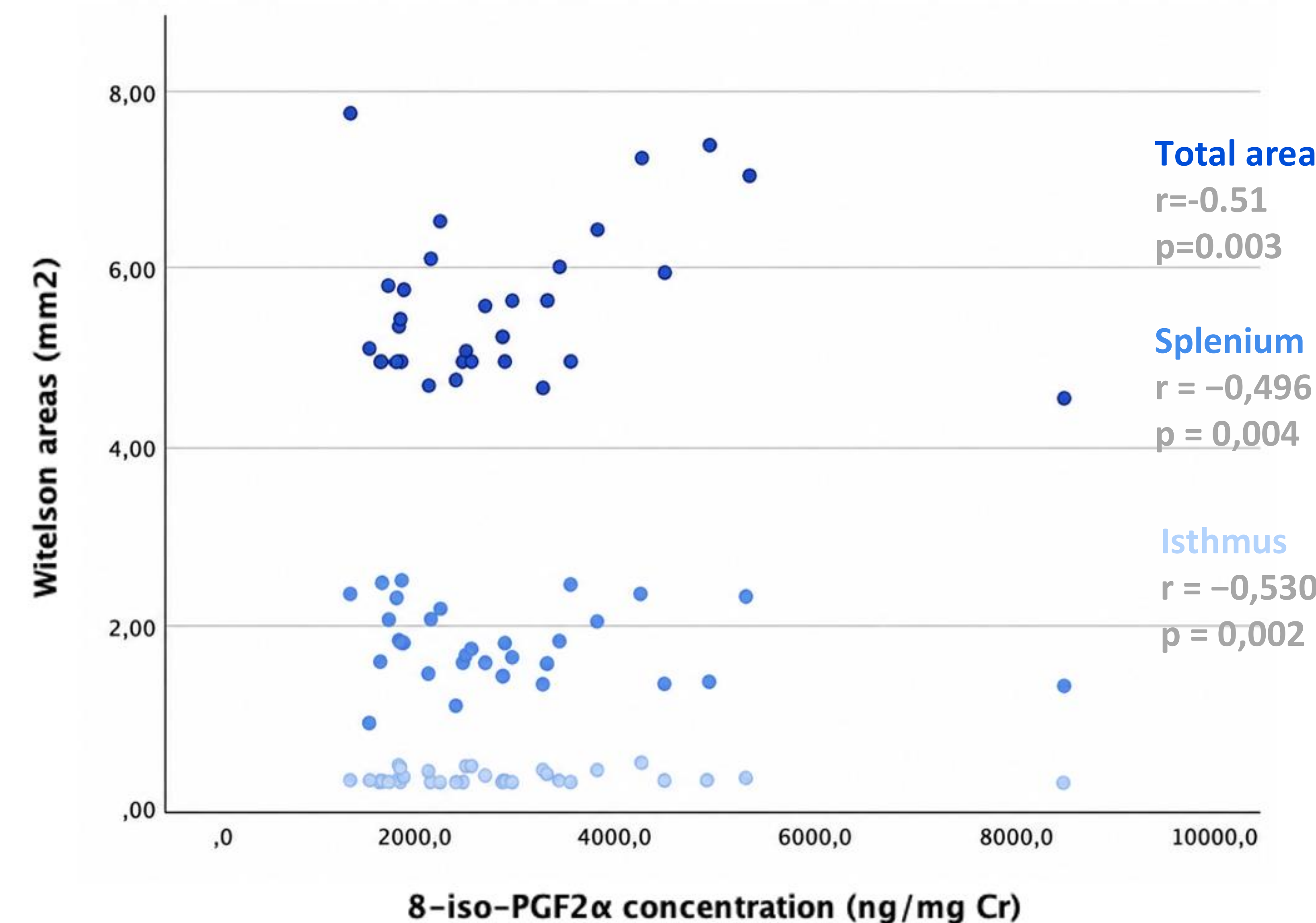
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Objectives: To evaluate the association between intrauterine oxidative stress, assessed by amniotic fluid (AF) 8-iso-prostaglandin F2α (8-iso-PGF2α) concentration, and fetal corpus callosum (CC) development in fetuses with congenital heart disease (CHD).

Methods: Prospective case-control study of 32 fetuses with isolated major CHD and 16 controls. CC morphometry was assessed by neurosonography at 32–36 weeks. Gestational age (GA)-adjusted AF 8-iso-PGF2α was measured in clinically indicated amniocentesis samples.

Results: GA-adjusted AF 8-iso-PGF2α concentrations were higher in CHD than in controls (2831 ± 1383 vs 2088 ± 1087 ng/mg Cr; $p = 0.003$). CHD fetuses showed **preserved CC length** but **reduced CC areas** (Table). Higher AF 8-iso-PGF2α concentrations were associated with smaller total CC, isthmus and splenium areas **exclusively in CHD**, but not in controls (Figure).

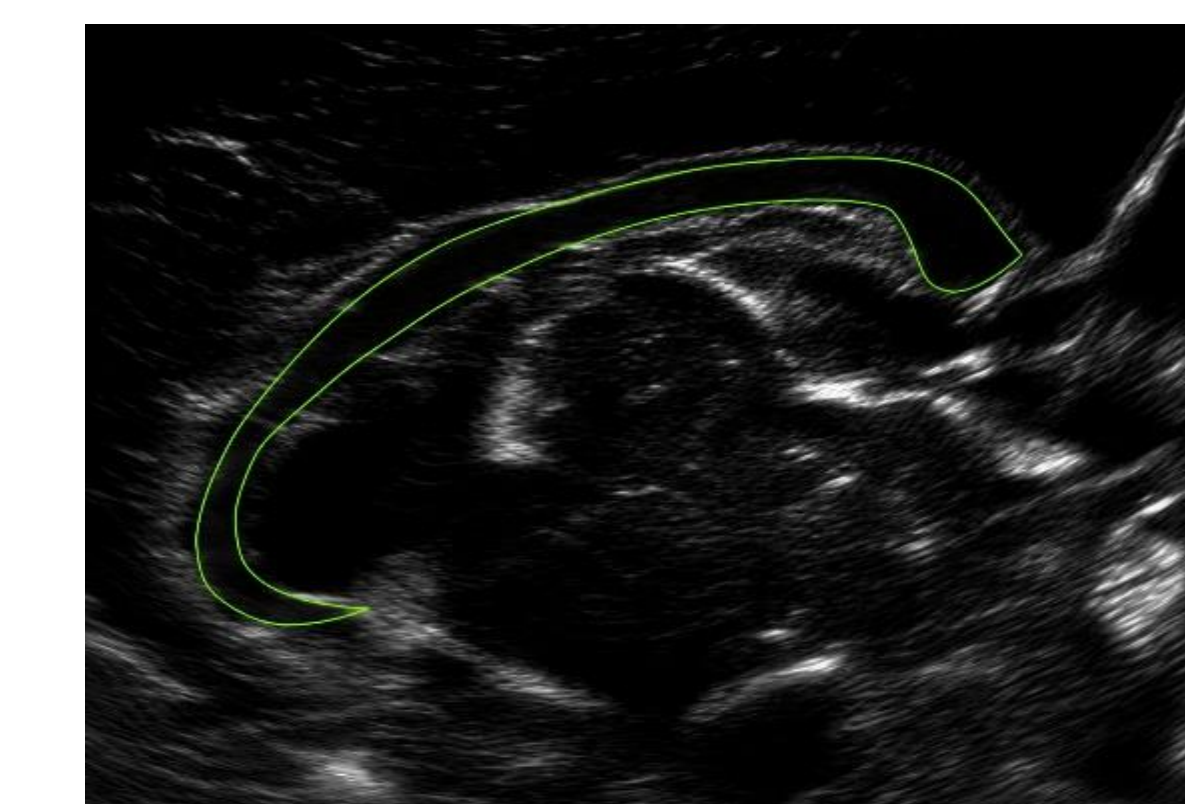
Higher oxidative stress is associated with smaller corpus callosum measurements in CHD



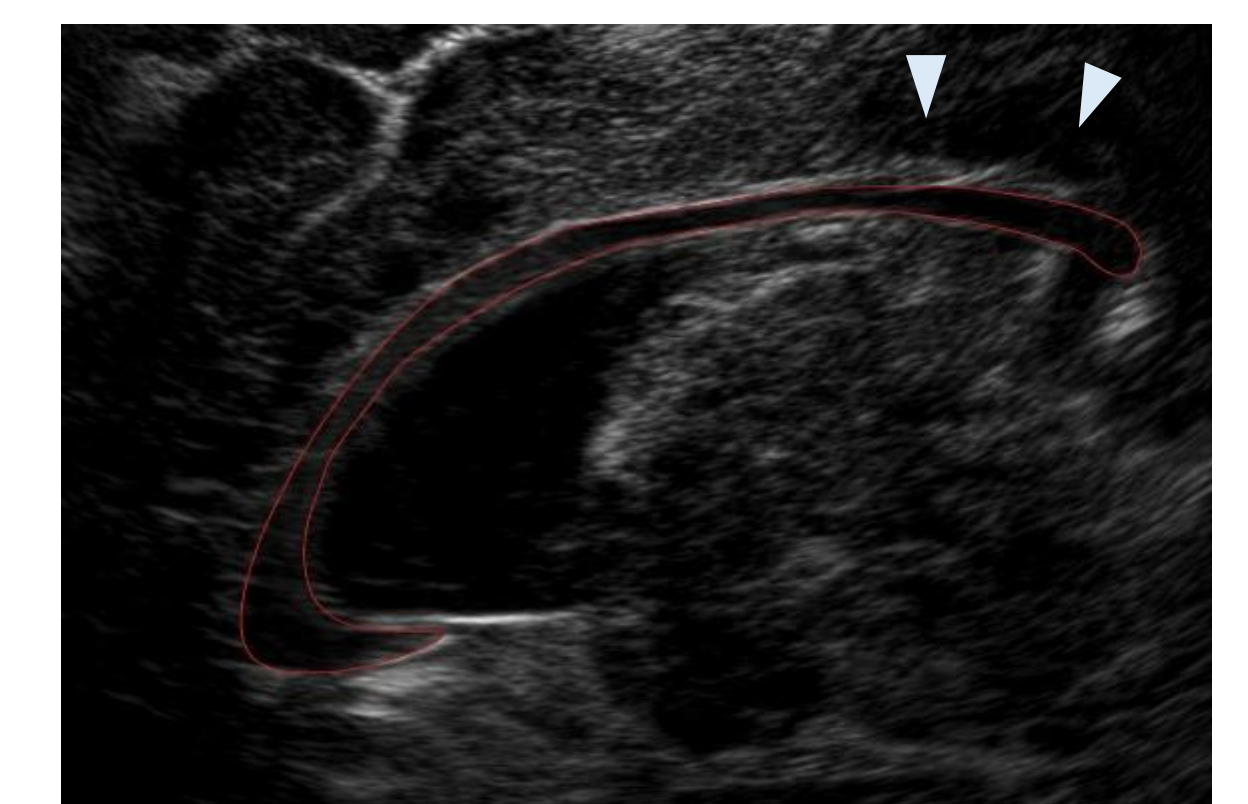
CC measurement	Controls (n=16)	CHD (n=32)
Total length (mm)	39.25 ± 1.86	39.15 ± 2.41
Total area (mm²)	7.17 ± 1.17	$5.57 \pm 0.83^*$
Anterior body (mm²)	0.78 ± 0.17	$0.64 \pm 0.20^*$
Isthmus (mm²)	0.47 ± 0.17	$0.32 \pm 0.07^*$
Splenium (mm²)	2.31 ± 0.22	$1.79 \pm 0.42^*$

Data shown as mean $\pm$ SD. * $p < 0.05$ vs. controls.

Control



CHD



Conclusion: Intrauterine oxidative stress is associated with reduced corpus callosum size, particularly affecting the posterior regions, in fetuses with CHD. These findings support a role of oxidative mechanisms in fetal white matter organization and identify oxidative stress as a potential target for fetal neuroprotective strategies.