Parietal differences during nonsymbolic number comparison in children with prenatal alcohol exposure

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What is the effect of prenatal alcohol on brain activation in the parietal lobe during nonsymbolic number comparison?

- 33 children (9.7-13.7 years)
  - 8 with fetal alcohol syndrome (FAS) or partial FAS (PFAS)
  - 5 nonsyndromal heavily exposed (HE)
  - 20 controls
  - Exposed = FAS/PFAS + HE

- fMRI task: which side has more faces?

- Parietal ROIs from Dehaene meta-analysis¹

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Results

• Groups did not differ in performance

• Activation differed in right posterior superior parietal lobule and right horizontal intraparietal sulcus

Controls activated right posterior superior parietal lobule more than exposed children

Controls activated right horizontal intraparietal sulcus more than FAS/PFAS group
Results

• Activation patterns of HE children
  • right horizontal intraparietal sulcus: similar to control children
  • right posterior superior parietal lobule: similar to FAS/PFAS group
Conclusions

• FAS/PFAS group showed less activation than controls in:
  - Right horizontal intraparietal sulcus: mediates mental representation of relative quantities
  - Right posterior superior parietal lobule: supports attentional function during number processing

• Nonsyndromal HE group
  - Right posterior superior parietal lobule activation lower than controls
  - Functioning of right horizontal intraparietal sulcus spared

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