Brain activity during working memory in congenital adrenal hyperplasia

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Brain activity during working memory in congenital adrenal hyperplasia

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INTRODUCTION
- The disrupted cortisol rhythm, in addition to other physiological challenges in CAH might affect the developmental trajectory of the brain
- Patients have been found to have problems with working memory (WM) and reduced cortical thickness in regions of the working memory network in adulthood
- These changes might be accompanied by changes in brain activity during working memory

AIM
- We aimed to compare working memory related brain activity between patients with CAH and healthy controls
- We also tested the modulating effect of sex

METHOD
- 29 patients with CAH (17 female) and 40 Controls (24 female), aged 16-33 years
- Participants underwent MRI 3T functional brain scanning while performing a verbal and visuo-spatial working memory task

RESULTS
- Working memory related brain activity was assessed by comparing activity during the encoding and decoding phases to activity during control conditions
- There were no differences in brain activity between CAH and controls during any of the WM tasks on a whole group level
- Sex-dependent effects were found only during the decoding phase of visuo-spatial working memory:
  - Males with CAH showed stronger activity in regions of the left dorsal visual stream compared to male controls
  - Females with CAH showed reduced activity in these areas compared to female controls
- There were no relationships between brain activity and performance (accuracy or reaction time) on this task in any of the groups

CONCLUSIONS
- CAH does not seem to have a major impact on the functional brain responses during working memory at adult age, for this specific task
- The similar level of activity in the presence of reduced cortical thickness suggests patients’ brains are able to compensate well during certain tasks
- However, activity of the left dorsal visual stream might be affected depending on sex
- Future multi-modal analyses will investigate the relationship between brain structure and function during working memory in patients with CAH

REFERENCES

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