Changes in the Corpus Callosum of Newborn Infants with Prenatal Alcohol Exposure (PAE)

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Conflict of interest disclosure

None of the authors have an affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization, and cannot identify any conflict of interest.

Management of potential bias

There are therefore no potential sources of bias identified or foreseen which require management
Ethics statement

• This study involves the retrieval and sharing of retrospective clinical data which was acquired for normal medical purposes

• Any data shared between the collaborators is first pseudo-anonymised and contains no personally identifiable clinical information

• This data can be used for research purposes as the following principles - relevant to UK and European legislation were adhered to:
  – Caldicott principles,
  – The UK Data Protection Act (sect. 33)
  – Confidential Advisory group (CAG sect. 251)
  – HM Gov. Information Commissioner’s Office guidance
  – NHS Digital Information governance procedures
## Diagnosis of children affected by PAE

### CHALLENGING
- Long gap: exposure...outcome
- Recognition?
- Additional comorbidity
- History difficult
  - Guilt
  - Recall?
  - Unavailable?
- Variation: Exposure ➔ outcome
- Overlap – other conditions

### IMPORTANT
- Self - understanding
- Appropriate interventions
- Family support
- Leads to better outcome
- Mental health
Earlier Diagnosis – neonatal period?

Exposure

Growth

Features

Neurological

FUTURE
Corpus callosum with PAE
The corpus callosum - MRI
CC with Ultrasound
Methodological approach 1

RETROSPECTIVE COMPARISON – 3 groups:

1. “normal group” – mild hypoxic-ischaemic encephalopathy
2. Prenatal alcohol exposure
3. substance misuse with no PAE

Validation against the ‘gold standard’ (MRI)
Measuring the C C C
Methodological approach 2
the way forward

• Standardising the approach – ‘best way’
• What are the normal values?
• measurement variation

PROSPECTIVE……. (collection normal data)
Accounting for prenatal alcohol exposure
Optimising the CC image

- Standardising technique
- Contrast
- Edge enhancement
- Digital image processing
Automation

- Manual v automated

- Machine learning
  - Comparison: normal values

- Building 3D picture? Potential - Gyral pattern/migration
Corpus Callosum Image – Digital Surface Modelling

- Complicated 3D shape
- Relationship with normal
- What measurements are most discriminatory?
THANK YOU

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Utility of US measurement of CC?

• Role in screening?
  – Those at risk
  – Selecting for detailed follow-up

• Role in diagnosis?
  – Determined by future follow-up studies

• ? Is it an early marker of neurological impairment