Behaviour in children with Neurofibromatosis Type 1: where does autism fit in?

Shruti Garg
BRC Fellow in Child Psychiatry
Overview

• Learning and behavioural problems in NF1
• Autism and NF1
• Phase 1 study
• Phase 2 study
• Future plans
Learning and behavioural problems in NF1

- Only 20% children will have any significant physical complication of the disorder.

- Most significant cause of lifetime morbidity are cognitive deficits- failure to achieve academic potential and behavioural difficulties.
Learning disabilities
- Mean IQ shifted to the left
- NF1 patients twice at risk of MR

Social skills
- Frequently picked upon
- Have problems with peers & fewer friends
- Incidence of autism around 4%

Behaviour
- Estimates for ADHD 40-50%

Internalising problems
- Higher incidence of anxiety & affective disorders

Cognitive & behavioural problems in NF1
What is Autism?

• Childhood autism, autism spectrum disorder, pervasive developmental disorders, Aspergers syndrome.

• Developmental disability which affects the way a person communicates and relates with other people.
What is Autism?

• Triad of impairment
  – Social communication
  – Social interaction
  – Routines, repetitive behaviours & sensory interests
Autism and NF1

- Prevalence rates of 0.3% to 15% (Gaffney & Tsai 1987; Mouridsen et al 1992).

- Noll et al (2007) found children with NF1 - more isolated, sensitive, less likely to have best friends.

- Some studies suggest social impairments due to ADHD.

- But literature is missing a systematic account of prevalence of autism in NF1.
The Manchester NF1 study

• Lack of up to date UK based study investigating different areas of behaviour & cognition affected by NF1.

• Mouse models have contributed to our understanding of molecular mechanisms underlying the cognitive deficits.
Phase 1 study

• To define the behavioural & cognitive characteristics of NF1 phenotype of children with NF1.
The study

Epidemiological Study

Genetic register
N=(220)

Social responsiveness Scale
(parent & teacher)

Conners
(parent & teacher)

Strengths & Difficulties
(Parent & teacher)
Methodology

- All children aged 4-16 years on the genetic register included
- Questionnaires sent by post along with consent form & permission to contact school
- Telephone follow up
- Teachers contacted over telephone & questionnaire sent
- Home visits to collect data for some parents
Results

• Parental response rate was 52.7% (n=109)

• Males 48% (n=52) and 52% females (n=56)

• Teacher response rate was 48.6% (n=53)
Social Responsiveness Scale: parent data

SRS parent T scores

- Normal: 44%
- Mild-moderate: 29.9%
- Severe: 28.7%
Conners questionnaire: parent data

ADHD index T scores

- 53% T<65
- 47% T≥65
Strengths & difficulty: parent data

SDQ total difficulty score

- 46% Normal
- 41% Borderline
- 13% Abnormal
SDQ Sub-scales: parent data

- Emotional symptoms: 30.2%
- Conduct problems: 25.5%
- Hyperactivity: 41.5%
- Peer problems: 46.2%
- Prosocial behaviour: 8.5%
Distribution of difficulties

- SRS: 26
- SDQ: 10
- Conners: 11
- Total: 38 (35%)
Social Responsiveness Scale: teacher data

SRS Teacher T scores

- Normal: 71%
- Mild-moderate: 24%
- Severe: 4%
Conners questionnaire: teacher data

ADHD index T scores

- 33% T<65
- 67% T≥65
Strengths & difficulty: teacher data

SDQ total difficulty score

- 54% Normal
- 26% Borderline
- 20% Abnormal

Legend:
- Normal
- Borderline
- Abnormal
Summary points

• More than half the parents reported autistic symptoms of the questionnaire.

• High prevalence of co-morbidity with ADHD.

• Parent teacher discrepancy.
Summary points

• Acosta et al (abstract presented at NF conference 2011) reported 8.6% of sample meeting the autism criteria on the SRS questionnaire.
Phase 2 study

- Estimating prevalence of autism in NF1

- Design
  - All phase 1 participants
  - Parental interviews using the Autism Diagnostic Inventory
  - Child assessments and tests for verbal IQ
  - N=50
Phase 2 study

- 45 children seen so far

- Roughly a 20-25% meet both the ADI + ADOS criteria for ASD
Implications

• High prevalence of autism spectrum disorder in NF1
  – Need for awareness & early recognition
  – Early educational support

• NF1- single gene disorder model for autism.

• Neurobiology known and potential treatments available.
Future directions

- Statins trials
  - *Chabernaud et al* (2012) Imaging study
Future directions

• Statin trial in young children (5-8 years).

• Studying the developmental emergence of the social and behavioural problems in NF1.

• Use of imaging.
Thank you
Research team

Susan Huson
Annuukka Lehtonen
Dorothy Trump
Gareth Evans
Jonathan Green