Neurodevelopmental Assessment of the High Risk Infant

Clare Thompson
University of Cape Town
Neonatal Medicine
What to assess

- Mother’s well being
  - Post natal depression screening
- General infant well being
- Corrected age specific development
- Neurological examination
- Other systems
- Weight and Head Circumference
Overview of infant assessments

• **Infant Neuromotor Assessment (INA):**
  - 0-12 m (best after 18 weeks)
    - G Motor
    - 15 mins

• **Alberta Infant Motor Scale (AIMS)**
  - 1-18 m
  - G Motor
  - 20-30 mins
  - Manual needed/score form
Overview of infant assessments

• **Bayley Scales**
  – 0-42 m
  – Cognitive/language/G and F motor
  – 50-90 mins
  – Manual/kit/score form etc

• **Prechtl: General Movements**
  – 8-12-18 weeks (2-4 m) (Fidgety movements)
  – Video and Video analysis required
  – Extensive training
Limitations of other assessments

- Observational only
- Time consuming
- Research based
- Too long for routine consultations
- Training and manuals/equipment required
- High cost
Infant Neuromotor Assessment

- Quick to do in the consulting room
- Relatively easy to learn
  - Does need some training and practise
- No equipment
- Single score sheet
- No cost involved
- Locally tried and tested!
- “Hands on” assessment
Aim of infant assessment

• Reassurance of normality
• Early detection of abnormality
• To screen and refer early for NDT - select few
• Early referral for hearing/visual evaluation
• Early and ongoing counselling guides parents towards
  – acceptance
  – reasonable expectations
Who needs early assessment?

Term infants
- Asphyxia neonatorum (5 min apgar <7)
- Perinatal hypoxia with HIE
- Hypoglycaemia (symptomatic or severe/prolonged)
- Infection (especially CNS)
- Severe growth restriction (especially if term <1500g)
- Seizures
- High TSB (at or near exchange levels) and Kernicterus
- Ventilation >48 hours (IPPV / oscillation)
- Neurological abnormality in first 7 days of life

Preterm infants
- < 1500g birthweight
- <32 weeks gestation
- abnormal cranial ultrasound (Gr 3 or 4 bleed, PVL, congen anomaly)
- Plus all of the above
Why early assessment in CP?

• Early referral ensures most effective NDT
• Disability cannot be cured BUT outcome and function can be better with
  – Early physiotherapy
  – Early botox
  – Early Occupational and Speech Therapy
  – Early parent training
• Early referral also helps with parental counselling and expectations
Key ages for assessment

INA
• 18-22 weeks corrected age
• 9 months age
• 1 year

Later assessment (Griffiths):
• 18 months (DQ, speech)
• 3-4 years (DQ/IQ)
The Infant Neuromotor Assessment

• See chart
• History
Equipment
Initial impressions

• Normal infant: Alert, Engaging, Curious
• Mother/child and child/examiner interaction
• Response to sound and spoken voice
• Following
• Absence of ATNR
• Squint
• Seizures and extra movements
• Growth (HC especially)
INA: Item 1 and overall impression
Assessment of tone (Items 2-6)

• Feel tone
• Measure angles
• Observe movement patterns
• Observe open hands and finger movements
INA: items 2-6
Assessment of postural and protective responses

- Pull to sit, sitting, prone lying
- Landau, Axillary hanging, Votja and collis
- Lateral, downwards, (forwards)
INA: items 7-18
INA: 11, 12, 13 and 17
Evaluation of items

• Deviant items
  – Abnormalities of tone and posture falling to right or left of current corrected age
    – 0-1
      • Probably normal
    – 2-4
      • Needs watching and may need NDT
    – 4+
      • NDT
Babies with special risk factors

- Neonatal Encephalopathy
- Kernicterus
Neonatal Encephalopathy (NE)
NE: Before discharge

- Cause of encephalopathy?
- Plan Further investigations if no evidence of hypoxia
- Detailed summary on RTH Booklet
  - Ventilated?
  - Seizures and Mx?
  - HIE score (Maximum and day 7 score)
  - Birth and discharge HC and weight
- Full neurological exam including careful assessment of feeding
  - Speech therapist if possible
- Inform mother where she can seek help
  - Paediatrician and /or MOU
- Good notes if hypoxia is probable cause , and if possible evaluate timing of insult (U/S head day one, U/S and or MRI at 7-10 days age)
- Record several accurate HC’s
NE: When should first visit be after discharge?

• Early evaluation of feeding at 48 hours
  • Feeding history and weight

• End of first week
  – Weight, HC and general well being
  – Feeding:
    • Adequate suck
    • Slow feeding?
    • Drooling?
    • Milk leakage?
  – Full neurological exam
  – Seizures?
Severe NE: Early problems

- Poor feeding
- Weight loss
- Irritability
- Parental stress, anxiety and exhaustion
- Seizures (rare)
NE: Poor feeding

- Breast feed if possible
- Complement with cup or bottle
- Encourage suck with a pacifier
- Refer to speech therapy

*Remember to assess for history suggestive of aspiration / inco-ordinate swallow*
Weight loss or plateau

- Common after a stormy neonatal course
- If well baby, persevere with feeding support
- Excess loss, re-admit
Irritability

• Often an early sign of neurological abnormality
• Usually associated with poor head circumference growth (but not always)
• Sleep rhythm reversal

• Try Melatonin
• Last resort: Sedate infant at night if obvious severe neurological abnormality and exhausted parents
Parental issues

• Frequent visits to support
• Repeated gentle counselling, emphasis on positives
• Use of other team members
  – Social worker
  – Counsellor
  – Speech therapy
• Financial help if severe neurological damage - CDG
• Early appointment at CP clinic may help
• Watch for parental depression and refer early
Kernicterus
Kernicterus

- Most common form of CP is athetoid
- Present with low tone early on, usually marked but not always
- Athetoid movements often appear later in infancy
- Need to follow longer (18 m – 2 years)
- Feeding difficulties common (GOR, inco-ordinate swallow)
- May also have mixed dystonic/athetoid picture and present with high tone early in infancy.
- Associated SNHL more common
Seizures

- Seizures in the first few months are unusual
- BUT Infantile spasms are more common in infant post NE
  - EEG to make diagnosis if not clinically classifiable
  - Aggressive management of spasms
Timing of subsequent follow-up

• If in first week weight gain is normal, breast feeding well and normal sleeping pattern
  – See again at 18+ weeks of age
  – Educate about possible seizures

• If not
  – See weekly until adequate feeding and weight gain
Visual problems

• Visual dysmaturity is common after moderate to severe HIE and in some preterm survivors
  
  *Don’t diagnose blindness early*

• Wait until 4-6 months of corrected age before ophthalmological referral

• VER and ERG are unhelpful before then

• Plasticity of the visual cortex often allows for ‘visual recovery’ even up to a year of age

• Isolated squint at 18 weeks maybe an indicator of more subtle neurodevelopmental problems and longer follow-up is advised
How to decide timing of the next visit

• How sure are you?
  – Any doubt about increased tone: earlier rather than later (if low tone, less urgent)

• Special risk factors
  – See within 4-6 weeks/earlier

• Normal infant but high risk
  – 18 weeks, 1 year, 18 months/3 years

• Always give parents enough information to empower them to call or come back earlier
Hearing and visual evaluation
Hearing

• Maternal history at each visit
  – Open ended questions

• OAE screening
  – In first week
  – False + and – possible
  – Does not test cortical hearing

• Early ABR ideal if available

• Formal audiometry from 4-6 m age
  – Must have head control

• High index of suspicion with high risk history

• Some deaf children do babble
Visual assessment

• Neonatal eye exam NB
• At 18 weeks
  – Following
  – Focus and engagement
  – No squint
• Refer for ophthalmological opinion after this assessment
• Remember visual dysmaturity
Feeding problems in CP

• GOR/GORD
• Inco-ordinate swallow
• Slow feeding

All may result in aspiration and recurrent pneumonia
Counselling

• Doom prophecies in the NICU are unhelpful and often wrong
• Parents need hope, no matter how bad you think it looks
• Small chunks of information are remembered better than long stories
• Medical terminology only serves to scare and confuse
• It is always better to say less, more often
• Counselling will never be a once off process – it is life long.
What not to tell parents

- Dismal prognoses
- Nothing can be done
What to tell parents

• The positives
• What they can do
• What they may expect (in small chunks/short time periods)

• *It is not their fault – especially the mothers*
Summary

• Developmental vigilance in all high risk infants
• Use a formal infant assessment tool
• INA is a useful consulting room tool
• Moderate and severe NE survivors need close and frequent initial follow-up
• Vision and hearing evaluation are integral to any consultation at any age
• In disability, appropriate frequent counselling is imperative
Where to learn the INA

• Phone me/email me
  – Clare Thompson (0834628636)
  – clare.thomson@uct.ac.za

• Mowbray Maternity
  – Tuesday and Wednesday mornings
Thanks

• Viv Magasiner and Chris Molteno
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• Ishmaeel – Film star at 4 months of age!