



GI Symptoms in Children with Life-limiting Conditions

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GI Manifestations in Children with Severe Disability

- Vomiting/regurgitation
- Distress/irritability
- Feeding Intolerance
- Constipation

Inconsolable crying in children with neuro-disability



Inconsolable crying in children with neuro-disability

- 3yrs old, Congenital CMV
- Portal hypertension, Cortical blindness, Deaf
- Severe global developmental delay
- Recent increased episodes of paroxysmal distress, agitation.
- Associated posturing, self injury and disturbed sleep
- Sweating, screaming - “crescendo”

Assessing the neurologically impaired child with excessive irritability

- Conditions With Severe Abdominal Pain?
 - Kidney stones
 - PUJ Obstruction (Crescendo with vomit at end)
 - Gallstones
 - Pancreatitis
 - Ischaemia – C1 esterase deficiency/HSP

Assessing the neurologically impaired child with excessive irritability

- Milder pain syndrome with visceral hyperalgesia
 - Aerophagia/dysmotility
 - Esophagitis
 - Peptic Ulcer
 - Coeliac Disease
 - Constipation
 - Inflammatory Bowel Disease
 - Bowel overgrowth

Assessing the neurologically impaired child with excessive irritability

- Non-GI pain
 - Hunger/nausea
 - Fractures/Joint Disease
 - CNS – eg shunt dysfunction
 - Drugs/Drug Withdrawal
 - Endocrinopathies (adrenal insufficiency)
 - Seizures
 - Dental

Esophagitis –

Maybe occult

Unlikely the sole cause of severe distress

Trial of PPI (Vs Scope)



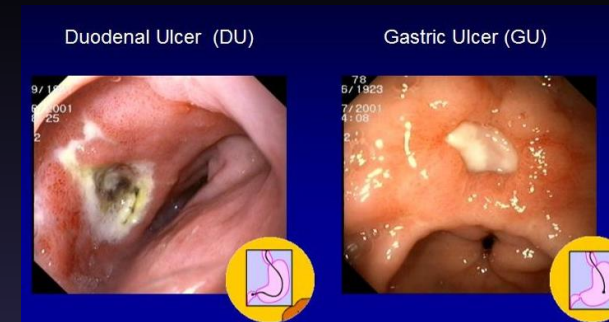
Peptic Ulcer –

Maybe occult

Very rare children Extremely rare in <12 yo

H. pylori does not cause pain (if no ulcer present)

Trial of PPI (Vs Scope)



Pancreatitis –

Maybe occult

Organic Acidemias/medication side effect

Amylase elevated



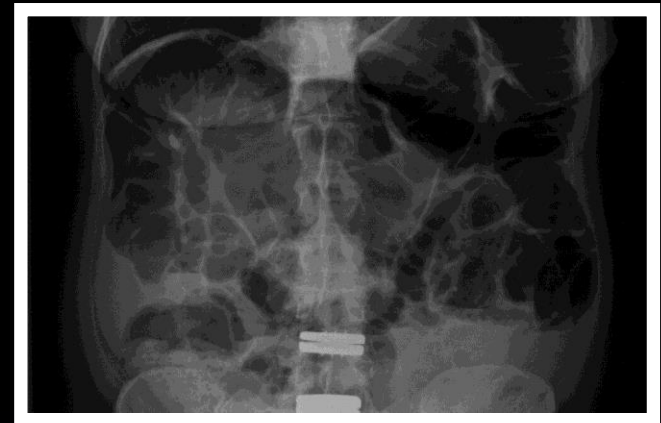
Aerophagia –

Abdo distension

No burping

May look like intestinal obstruction/ileus
(no fluid levels)

?Gas-bloat/fundoplication association?



Foregut dysmotility –

Gas bloat - PEG / Fundoplication

More common in setting of spasticity

Feeding intol/vomiting

Jejunostomy feeding may help



Constipation

Extremely Common

Not likely to be the cause of severe pain



Approach to the neurologically impaired child with excessive irritability

- Look for other organic symptoms/signs
- Examine for tenderness – GI and elsewhere!
- Minimum work –up includes
 - Inflammatory markers/FBC/ Albumin/amylase/Fecal calprotectin
 - Abdominal U/S/MSU
 - Abdominal Xray (constipation/distension)
 - Targeted boney x rays
 - Trial of acid blockers (obviates Scopes)

Pain or Irritability

Sustained activated behavioral state associated with crying or agitation not easily consolable despite reasonable measures.

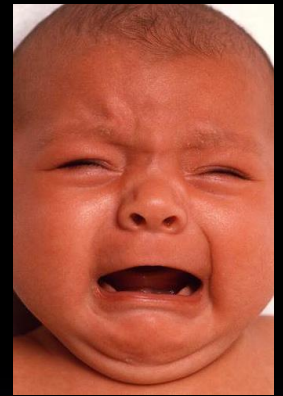
Occurs with greater frequency in infants & children who are globally delayed with motor issues.

Inconsolable crying – Is it in the abdomen?

- Infantile Colic Paradigm
 - Paroxysmal distress
 - Other stereotypical manifestations (arching, pain facies)
 - No other “red flag” features
- (Elizabeth Giles Minnesota)



Infantile Colic



- Infants are not born to self-regulate
- Attachment relationships are the context for self-regulation
- Dyadic interaction with mother
(reciprocity/simultaneous arousal)

Infantile Colic

- Asynchrony leads to
 - Hyperarousal (agitation, irritability)
 - Inability to self-regulate – Rapid transition from any state to crying state
 - Colic is a problem of arousal and self-regulation

- The brain injured infant is unable to respond to overtures from the primary caregiver with expected behavioral patterns.
 - Less visually reactive, less facial expressivity,
 - less able to control movement, spasticity or arching,
 - not able to sooth with appropriate caregiver

Autonomic dysfunction in neurologically impaired children

- **Cold hands and feet (abnormal vasomotor reactivity)**
- **Constipation**
- **Feeding intolerance**
- **Abnormal sweating (hyper- or hypohydrosis)**
- **Abnormal core temperature regulation**
 - **Either as abnormal range of temperature throughout day or in response to cold or heat challenge**
- **Abnormal heart rate variability (if severely impaired)**
- **Aberrant flushing**
- **Central hypoventilation (especially when ill)**

Assessing the irritable child

- **Hunger**
- **Nausea**
- **Constipation**
- **Pain**
- **Seizures**
- **Overstimulation/Self-stimulation**
- **“Neuro-irritability”**
 - **Inability to self-sooth**
 - **Increased sensitivity to sensory stimuli (especially vestibular)**
 - **Retained Moro & extensor reflex**
 - **Fragmented sleep-wake cycles**
- **Autonomic events**

Assessing the irritable child

- Reactivity to environment
- Current state of physiologic arousal
- Visual alertness
- Responsiveness to gentle talking, touch, humming, etc
- Response to being moved in space and to being rocked
- Response to being fed, voiding, defecating, being changed

General Intervention

With onset of crying:

- **Usual check – nappy, hunger etc**
- **Decrease environmental stimulation (quiet room, etc.)**
- **Gentle touch**
- **Soft music**
- **Massage**
- **Sensory therapies (brushing etc.)**

Medical intervention

- Consultations:
 - Speech/language for oral stimulation and for feeding
 - Occupational therapy for sensory stimulation
 - Physiotherapy for stretching and positioning
 - Nutrition
- Directed medical therapies for e.g. reflux disease
- Laxatives
- Paracetamol
- Diazepam?
- **Gabapentin** (? mood effect or pain effect)

Gabapentin

- Structurally related to GABA
- Appears to prevent development of hyperalgesia in animal models
- Effective in many inconsolable neurologically impaired infants
- Is it acting on neuropathic pain, as a mood stabilizer or ???

Gabapentin

One retrospective case series:

- n=9, age 9 months-22 years; nonverbal, nonambulatory with severe global neurologic impairment
- Crying, arching, disrupted sleep, feeding intolerance, irritability, pain, agitation
- Gabapentin 5 -> 15-35 mg/kg/day (TID or QID)
- Marked symptom improvement

Hauer JM, Wical BS, Charnas L: Gabapentin Successfully Manages Chronic Unexplained Irritability in Children With Severe Neurologic Impairment. Pediatrics 2007, 119;e519-22

Summary- in the neurologically impaired child

- Severe irritability is unlikely GI without organic GI symptoms
- Some GI disorders maybe occult and need to be ruled out
- Other less severe GI disorders maybe contributing
- Most children have neuro-irritability/arousal/regulatory problems/autonomic dysfunction
- Multi-disciplinary assessment/management for severe cases.

General interventions

- Move gently and purposefully
- Lift head and hold under knees (prevented going into opisthotonic posture)
- Rocking & body contact
- Warm pack to tummy
- Swaddling
- Head of bed up to 30 °
- Avoid overstimulation!