AN OSTEOPATHIC APPROACH TO COLIC

Heather Ferrill DO, MS
Associate Professor OPP
Rocky Vista University College of Osteopathic Medicine
OUR GOALS TODAY

- The current research on the pathophysiological mechanisms underlying colic
- The current research on the treatment for the infant with colic
- Anatomical and physiological relationships important in the osteopathic evaluation of the infant with colic
- Indications and contraindications to OMT in the infant with colic
- Fast and easy OMT for the busy PCP to use with the colicky infant
Colic Defined

- Scientific-defined for research efforts
  - Wessel criteria (1954)
    - Crying and fussing more than
      - 3 hours per day
      - 3 days a week
      - For more than 3 weeks
  - Inconsolable, excessive crying associated with hypertonicity, perceived pain, borborygmus, wakefulness
- Cyclic
- Onset 2-6 weeks old and lasts typically 3 months
DIFFERENTIAL DIAGNOSIS INCLUDES:

- Infection – meningitis, encephalitis, sepsis, pneumonia, UTI, osteomyelitis, septic, toxic synovitis, AOM, herpes stomatitis, oral thrush, gastroenteritis, herpangina, insect bites, cellulitis, infectious arthritis
- Trauma – non-accidental trauma (skull fracture, intracranial bleed, rib fracture, pneumothorax, long bone fracture, intra-abdominal blunt trauma), accidental trauma (falls), corneal abrasion, hair tourniquets (digits, penis, clitoris)
- Metabolic – inborn error of metabolism, electrolyte abnormality, acid/base derangement, hypoglycemia
- Foreign body – oral, nasal, ear, pharynx, eye
- GI – intussusception dehydration constipation, GERD, hernia
- CV – SVT, congenital heart disease
- Environmental: neglect, hunger
Current research on pathophysiology and etiology of colic

- Dietary
- Psychological
- Gastrointestinal
- Hormonal
- Neurological immaturity
ETIOLOGY

- **Dietary**
  - Breastfeeding:
      - Prospective cohort study of 856 mother infant dyads
      - Maternal questionnaires at 1 and 6 weeks regarding feeding sources, presence of colicky behavior, maternal anxiety and alcohol consumption
      - Breastfeeding did not have a protective effect on the development of colic
      - Maternal anxiety was positively correlated with colic
ETIOLOGY

- Dietary
  - Food sensitivities
      - RCT conducted among exclusively breastfed infants with colic (90 completed the trial)
        - Average cry-fuss time over 48 hours was 630-690 minutes
      - Active arm: mother’s excluded cow's milk, eggs, peanuts, tree nuts, wheat, soy, and fish. Control arm: mothers continued to consume these foods
      - Outcomes assessed after 7 days as the duration of cry-fuss behavior over 48 hours using charts
      - End point 25% reduction in cry-fuss behavior over 48 hour period after 7 days of dietary intervention
      - Result: objective 21% less cry-fuss time in the low allergen diet group.
ETIOLOGY

- Psychological
  - The relationship between maternal post-partum depression and colic
  - Ante-partum stress and depression and colic
  - Association is clear—what is not clear is if there is an etiological relationship
  - Maternal/familial stress and depression anxiety causes colic?
  - Colic causes maternal/familial stress, depression and anxiety?
  - Or they just exist together?
ETIOLOGY

- **Physiological**
  - GI related
    - Gut motility and neurological immaturity
    - Intestinal flora imbalance
  - Neurobiological
    - HPA axis and adrenergic system feedback loops activated as a result of perceived danger or discomfort (on the part of the infant)
    - Epigenetic modulation in the limbic system may explain correlations between regulatory problems in the first months of life and behavioral/feeding problems later in life
ETIOLOGY

• **H. Pylori** and Infantile Colic
  - Case control study (Saudi Arabia)
  - Used *H. Pylori* stool antigen testing
  - Case population
    - 55 infants with colic per Wessel criteria
      - 2-4 months age
      - 45 (81.8%) tested positive for *H. Pylori* infection
  - Control population
    - 30 infants without colic
      - Age, country of origin, gender and ethnicity matched
      - 7 (23.3%) tested positive for *H. Pylori* infection

**Colic and Migraine**

- **Children with personal history of migraine**
  - 208 kids aged 6-18 with headache history; 471 without
    - 72.6% of children with migraine also had infantile colic
    - 26.5% of children without headache had infantile colic


- **Parents with migraine and their kids**
  - Maternal migraine was associated with a more than 2-fold increase in prevalence of infantile colic

Colic and other childhood problems

- Prospective study comparing infants with and without severe colic during infancy and 10 years later.
  - Significantly increased incidence of
    - Recurrent abdominal pain (abdominal migraine)
    - Allergic diseases (asthmatic bronchitis, rhinitis, conjunctivitis, atopic eczema, food allergy)
    - Psychological disorders (sleep disorders, aggressiveness, fussiness, ‘supremacy’)

**Facilitation**

![Diagram of brainstem and convergence]

**Figure 5. Relations of Neurons in the Cerebro-Spinal and Autonomic Systems**

- Somatic (cerebro-spinal) neurons shown in heavy lines; visceral (autonomic) neurons in light lines.
  1. afferent somatic neuron
  2. afferent visceral neuron
  3. spinal ganglion
  4. afferent neural areas of the sympathetic
  5. afferent neural area of the parasympathetic
  6. afferent neural area of the somatosensory
  7. ganglion of the sympathetic
  8. somatic receptor (sense receptors in skin)
  9. VR, visceral receptor (sense organ in visceral)
  10. VR, visceral effect (smooth muscle fiber)
  11. VR, visceral effect (visceral effect)

Trigeminal nerve nucleus (motor and sensory)

Spinal Trigeminal nucleus

Visceral Afferents (VII, IX, X)

Visceral Efferents (X)

Motor Efferents (IX, X)

C1 Rootlets

TREATMENT OF COLIC

- Rule out organic disease
- Reassurance, reassurance, reassurance
- Dietary interventions
  - Maternal diet restriction (big 5: gluten, dairy, egg, citrus, soy)
  - Formula changes
  - Herbal teas
  - Sugar water
- Supplements
  - High fat diet per mother or fats added to infant diet
  - Pro- and pre-biotics
- Medication
  - Simethicone
  - Dicyclomine
  - Methylscopalamine
- Behavioral
  - Quiet area/decreased stimulation
  - Vibration (car ride, sitting on the dryer, etc)
  - Intensive parental training
- Manual treatment/therapy
  - OMT
  - Chiropractic
  - Massage
What may work (according to the literature)

- Fennel extract tea
  - Chamomile, vervain, licorice, fennel, balm mint
  - Fennel has analgesic effect
- Sucrose/glucose solutions
  - Sweetness may induce analgesic effect
- Manipulation (of any sort)
  - Several showed benefit, but lack of blinding, small ‘n’ limited usefulness of the studies
  - Studies not well funded or of good trial design
  - Need better studies
- Probiotics
  - *L. reuteri* has been found to be helpful in several studies
Quick OMT for the colicky baby

High yield areas to evaluate and treat as necessary

- OA
  - Suboccipital inhibition/soft tissue
- Mid thoracic
  - Rib raising
- Thoracolumbar junction
  - Myofascial release
- Lumbar spine
  - Myofascial, especially upper lumbers
- Pelvic diaphragm
  - Myofascial release
Indications
- Somatic dysfunction
- Organic disease ruled out and “functional” cause is suspected

Contraindications
- ??
- Rule out organic disease
- Follow contraindications for modalities

How often to treat?
- Depends-weekly is most often, usually
- Gauge how much help parents need
  - Treat parents as well if necessary
PELVIC DIAPHRAGM

Myofascial release
LUMBAR SPINE

Myofascial release
THORACOLUMBAR JUNCTION

- Myofascial release
Mid-thoracic spine and ribs

Rib raising

Gray's Anatomy of the Human Body Plate # 839
OCCIPITOATLANTAL JOINT

Soft tissue/inhibition

- Also addresses upper cervical spine
What we learned

- Colic is tough
  - There are no answers, lots of questions, lots of interesting research going on
  - Focus on helping parents cope

- OMT for colic is focused on
  - Augmenting circulatory motion in the abdomen
  - Treating viscerosomatic and/or somato-visceral reflexes
  - Areas to focus on in the busy practice
    - Look at diaphragms
      - pelvic, thoracic diaphragm
    - Mesenteric root
    - Mid-thoracic region
    - OA/upper cervicals
THANK YOU!

St. Mary’s Glacier, Colorado
REFERENCES

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