Torticollis and Plagiocephaly

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Objectives

To gain a better understanding of:

- **WHAT** are torticollis and plagiocephaly
- **WHY** the incidence has increased so dramatically
- **WHO** is most at risk
- **HOW** you can help with prevention
- **WHEN** intervention should be initiated

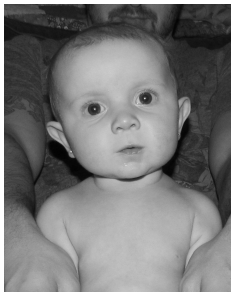
WHAT is torticollis?

- The word *torticollis* describes a posture characterized by ipsilateral side flexion
  (± flexion or extension) and contralateral rotation

N.B. Torticollis is named by the direction of the TILT, not the TURN.

Left torticollis

Right torticollis



Review of Anatomy

- Muscle most commonly associated with torticollis is the sternocleidomastoid (SCM)
- There is a SCM on each side
  - *1 can be tight*
  - *1 can be weak*
  - *A combination of both*

- Other soft tissue (skin, fascia) and muscles may also be affected

Splenius capitis

Levator scapula

Platysma

Scalenes

Types of Torticollis

- Congenital muscular torticollis (CMT)
  - *Intra-uterine positioning*
  - *Fibromatosis*
  - *Generally, shortening of SCM on one side*
  - *Incidence varies from 0.4-1.9% (Karmel-Ross, 1997) to 16% (Stellwagen, 2008)*
- Can also be acquired after birth
  - *SCM shortening less likely*
  - *Contralateral weakness generally the problem*

Differential Diagnosis

- Less common
  - *Klippel-Feil syndrome*
  - *Cervical spine articular malformations, subluxations, or dislocations*
  - *CNS lesions (cervical spinal cord, intracranial) or peripheral nerve lesions*
  - *Benign paroxysmal torticollis*
  - *GERD (Sandifer's syndrome)*
  - *Ocular torticollis*
  - *Vestibular torticollis*

Associated Findings

- Plagiocephaly
- Gross motor delays
- Hip dysplasia
- Brachial plexus injuries
- Clubfoot/metatarsus adductus

WHAT is plagiocephaly?

- Changes in head shape
  - *Posterior flattening*
  - *Ear shift*
  - *Forehead bossing*
  - *Facial asymmetry*

Causes of Plagiocephaly

- As with torticollis, can be:
  - *Congenital (due to intra-uterine positioning)*
  - *Acquired (due to repetitive and/or prolonged positioning on one side of the head)*

- Cited incidence varies widely, from less than 1% to 48%
- Asymmetries develop due to:
  - *Flattening of bone which is not yet fully calcified*
  - *Shifting of individual cranial bones due to open sutures*
  - *Craniosynostosis needs to be ruled out*
- Majority of change in head shape will occur by 12-13 months of age
  - *Less significant changes can continue up until age 2*

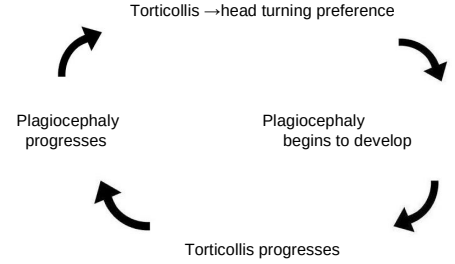
WHY are we here?

- We have identified a knowledge gap in the community
  - *"Wait and see" approach*
  - *Referrals stating incorrect side*
- Health care professionals have a great opportunity to help prevent torticollis
- The incidence of torticollis and plagiocephaly has increased dramatically in recent years

WHY this dramatic rise?

- Since launch of the *back to sleep* campaign (1992), the frequency of posterior plagiocephaly has increased (Pogliani et al 2011)
- The "tummy to play" message seems to have been lost
- Development of plagiocephaly predisposes the infant to the development of torticollis

The cycle of torticollis and plagiocephaly



WHO is most at risk?

•Multiple risk factors, including:

- *Body weight*
- *Body length*
- *Birth trauma*
- *Multiple births*
- *Male gender*
- *Complicated labor*

Maternal uterine abnormalities
Breech presentation
Facial asymmetry
Plagiocephaly
Primiparity

Karmel-Ross, 2006

HOW do you play a role in prevention?

- Being familiar with the risk factors
  - *Early identification of at-risk infants*
- Educating parents re: strategies to prevent plagiocephaly
  - *Helps avoid the plagiocephaly ↔ torticollis cycle*

WHEN should we intervene?

- Starting on day 1 of life for prevention, by encouraging prone positioning while awake
  - *"Back to sleep, tummy to play"*
- In 1 study of 380 healthy neonates, assessed at birth and seven weeks (van Vlimmeren, 2007)
  - *Only 9 of 23 children who presented deformational plagiocephaly at birth presented with deformational plagiocephaly present at follow-up*
  - *75 other children developed deformational plagiocephaly between birth and follow-up*

- Encouraging prone positioning while awake, from birth - "tummy to play"
  - *Helps prevent plagiocephaly and promote the acquisition of gross motor skills*
  - *New Canadian guidelines recommend "Infants (aged less than 1 year) should be physically active several times daily, particularly through interactive floor-based play." (CSEP, 2012)*

Prevention strategies con't

- Avoid supine positioning aside from crib, car seat
  - *Minimize the use of bouncy seats, swings, etc*
- Alternate positioning in crib nightly
  - *Head at one end one night, and the other end the next*
- Alternate positioning at diaper changes

- Refer to Physiotherapy ***as soon as torticollis is suspected***
- It is never too early to be assessed
- Early assessment and intervention
  - *Facilitates treatment*
  - *Allows more time for change to occur (with regard to head shape)*
  - *Reduces risk of developmental sequelae (eg. gross motor delay)*

Accessing PT Services

- A referral to CHEO PT must be received from a family physician or paediatrician
- Referrals indicating torticollis will automatically be triaged into the torticollis class and seen ASAP
  - *Babies older than 9 months are seen individually rather than in the class format*

- Babies do NOT need to be seen by Neurosurgery's Plagiocephaly Clinic first
- A new patient class is held weekly, either on Tuesday morning or Wednesday afternoon

<u>There is currently NO waitlist!!!</u>

What if my patients live outside of the Ottawa area?

- Follow-up visits occur every 3 – 8 weeks, depending on the baby
  - *Many families are willing and able to drive longer distances to come to our clinic*
- PT resources vary widely among communities
  - *Some PTs in private practice are quite comfortable to treat this population while others aren't*

Other Resources

- Parent information about torticollis and plagiocephaly can be found on CHEO's website at:

http://www.cheo.on.ca/en/torticollis

Torticollis Program at CHEO

- Group setting for assessment and follow-up visits
- Ratio of 2 PTs : 6 babies for assessment and 2 PTs : 4 babies for follow-up
- Assessment class includes education session and individual evaluation
- Focus on thorough understanding of the problem and of the home program

Torticollis at CHEO con't

- Treatment targets strengthening weak muscles, stretching tight muscles, and promoting gross motor development
- Head shape is also evaluated at each visit
- Follow-up until the baby meets two criteria:
  - *Torticollis is resolved*
  - *Sitting independently*

Treatment Strategies

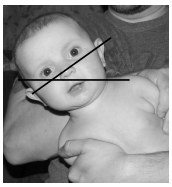
	Torticollis	Plagiocephaly	Gross Motor Development
Positioning	✓	✓	
Strengthening	✓		
Stretching	✓		
Tummy Time	✓	✓	✓

Positioning

- Look around the house for hidden "traps" that encourage baby to look to their preferred side
- Provide stimulation to the opposite side
  - *Need to control opposite shoulder to ensure neck rotation and not trunk rotation*

Strengthening

- Takes advantage of babies' head righting reflex
  - *Emerges at 2-3 months of age*
  - *Response is to right the head on the body*

Strengthening Strategies

- Carrying techniques
- Picking baby up
- Wedging



Stretching

- Focus on SCM but may need to stretch other soft tissues
- Do not allow for compensations
- Slow and sustained
- Multiple times a day
- Opposite to the preference

NB: Only 10-20% require stretching. 100% require strengthening.

Tummy Time

- As discussed in context of prevention
- Many babies dislike it – perhaps even more so in babies with torticollis
- Continue to provide stimulation on their non-preferred side
- Parent education/encouragement often required
  - *Knowing their babies cries*
  - *Do not pick up at the first tear*

Key Points

- Look for risk factors
- Early intervention is best
- Educate parents to prevent the development of torticollis and plagiocephaly…

TUMMY TIME!!!

References

Canadian Society of Exercise Physiology. Canadian Physical Activity Guidelines, Canadian Sedentary Behaviour Guidelines: Your Plan to Get Active Every Day. 2012. www.csep.ca/guidelines

Karmel-Ross K; Lepp M. Assessment and treatment of children with congenital muscular torticollis. Phys Occup Ther Pediatr, 1997. 17(2):21-67.

Karmel-Ross K, 2006. Physical Therapy for Children, 3rd Ed. St. Louis: Saunders Elsevier.

Pogliani L; Mameli C; Fabiano V; Zuccotti GV. Positional Plagiocephaly: what the pediatrician needs to know. Childs Nerv Syst, 2011. 27:1867-1876.

Stellwagen L; Hubbard E; Chambers C; Lyons Jones K. Torticollis, facial asymmetry and plagiocephaly in normal newborns. Arch Dis Child, 2008. 93:827-831

van Vlimmeren LA; van der Graaf Y; Boere-Boonekamp MM; L'Hoir MP; Helders PJM; Engelbert RHH. Risk factors for deformational plagiocephaly at birth and at 7 weeks of age: a prospective cohort study. Pediatrics, 2007. 119(2):e408-18.

Questions?