

## Breastfeeding and Tethered Oral Tissues: Air Induced Reflux and Obstructive Sleep Apnea

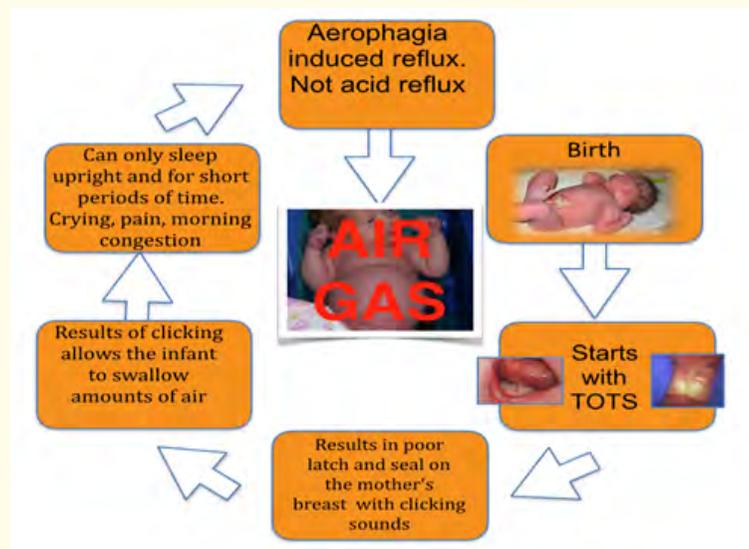
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### Air-Induced Reflux-Aerophagia



**Figure 1**

### Reflux and Aerophagia

Physicians will often diagnose and treat infants with clinical signs of gastroesophageal reflux (GER) and in extreme cases gastroesophageal reflux disease (GERD) [1-7]. Infant reflux has classically been defined as a condition where the contents of the stomach are spit out, usually shortly after feeding [8].

The differential diagnosis of (GER) and its treatment can vary widely. It is sometimes recommended that the family wait it out, since many in the medical world feel that reflux in many will often become less persistent as an infant gets older, or if the symptoms continue the reflux may be diagnosed as gastroesophageal reflux disease (GERD). Although GER is not usually considered a pathological condition, its therapeutic management represents a controversial issue. Pharmacological treatment of GER often does not resolve the infant's symptoms.

The diagnosis of gastroesophageal reflux (GER) is used commonly in preterm infants with infants presenting with signs and symptoms

of GER as high as 22%. Non-pharmacological approaches such as changing infant body positions or alternative feeding strategies can often reduce or eliminate the problems.

GER is often attributed to an allergy or a blockage requiring surgical intervention when pyloric sphincter stenosis is present. Others suggest that spitting up and regurgitation are simply symptoms of GER and that as long as an infant is healthy, content and growing well, the reflux and its symptoms are not a cause for concern or intervention. Comments such as your child will in all likelihood outgrow it are common.

### Just wait it out and things get better in a few months

While it may be true that symptoms of (GER) often do eventually resolve as the infant gets older, suggesting to mothers and fathers to just wait it out and allow their infants continue to have pain, cry, act fussy, and remain uncomfortable from three to twelve months is not comforting for parents.

Infants spend a great amount time in the first 3 - 6 months lying in a supine or semi-supine position. This allows the movement of stomach's contents to move toward the esophagus, which in turn can cause GER symptoms to become more prevalent.

Infant nourishment in breastfed and bottle-fed infants is primarily completely liquid for the first six months of life; thus, the movement of the stomach's contents upward is even more likely to occur and thus can contribute to the development of infant reflux symptoms.

Sometimes it is suggested that an infant might simply drink too much or too fast. Although infant reflux most often occurs after a feeding session, it can happen anytime an infant coughs, cries, or strains.

These diagnoses are made without considering what may actually be aerophagia-induced reflux (AIR).

### Physician's Differential diagnosis

The common differential diagnosis for determining the causes of infant reflux include evaluation for such conditions as allergic gastroenteritis, which is defined as an intolerance to something in food, usually a protein in cow's milk [5].

Gastroesophageal reflux disease (GERD) is a more severe condition where the reflux is acidic enough to actually irritate and damage the lining of the esophagus. Eosinophilic esophagitis is an allergic condition where eosinophils infiltrate the lining of the esophagus.

A search of the existing literature indicates that TOTS is rarely if ever considered in the evaluation of infants presenting with GER. When an infant is found to be swallowing large amounts of air into the stomach, a condition known as aerophagia or air-induced reflux, can force the stomach's content upward, which is then followed by regurgitation or even projectile vomiting of the contents. Health-care professionals usually disregard the effects of breastfeeding, TOTS and how this can affect infant reflux.

### Pharmacologic Management

The initial rush to use drugs is neither beneficial nor recommended [9]. Treatment of infant gastroesophageal reflux (GER) is to prescribe adult anti-reflux drugs. Infants are placed on oral medication: acid-blocking drugs like an H-2 blocker such as ranitidine (Zantac), a proton pump inhibitor such as omeprazole (Prilosec), or lansoprazole (Prevacid).



*Figure 2*

Pharmacologic treatment of infants with reflux symptoms is problematic. There appears to be little evidence to suggest that pharmacologic agents help these infants. Children taking these medications may also face an increased risk of certain intestinal and respiratory infections. In infants, prolonged use of proton pump inhibitors has been linked to problems in iron and calcium absorption.

### **What is Gastroesophageal reflux**

Gastroesophageal reflux occurs when the stomach contents flow back up into the esophagus of infants, this often results in repeated episodes of projectile vomiting or regurgitation of the stomach's contents immediately after nursing. The involvement of ankyloglossia (tongue-tie) and upper lip-ties (TOTS=tethered oral tissues) should be part of the differential diagnosis.

### **Adding evaluation of (Tethered Oral Tissues) lip and tongue-ties to the differential diagnosis**

Revising tethered oral tissues eliminates the need for and pharmacologic intervention, general anesthesia, hospitalization, blood tests, or other invasive procedure. In reality the correlation between lip-ties and tongue-ties and swallowing of air by infants is quite significant and needs to be part of any infant evaluation when reflux is suspected.

When physicians include TOTs as part of a differential diagnoses many infants would be spared the need for these extensive tests and unnecessary drugs [10-16].

### **Infant reflux symptoms**

1. Vomiting after breastfeeding or bottle-feeding
2. The infant is unable to sleep while lying down
3. The infant exhibits irritability and crying unless held upright
4. The infant can only be comforted when sleeping in a parent's arms, infant car seat or swing
5. The Infant wakes up congested in the morning due to sleeping silent reflux, often leading to treating the problem as an allergy to mother's milk
6. A physical history exam by the parents after nursing indicates the infant having a distended or hard belly after breastfeeding
7. A history of being very gassy

8. When the mother's latch is evaluated it shows an attachment to the mother's breast is weak, inconsistent, poor, and is associated with clicking or sucking in air into the stomach known as aerophasia. Aerophagia is a condition of excessive air swallowing, which goes to the stomach.
9. Infants may have slow weight gain or a diagnosis of failure to thrive.

### Example of a patient with a laser release of the lip- and tongue-tie with a diagnosis of GERD

The following photos are from an eight-and-a-half-month-old infant who underwent all of the medical differential diagnostic procedures and genetic testing. The parents were told the infant might have severe developmental problems.

### Revision of the lip and tongue resolved these problems

It is important to include tethered oral tissues such as tongue-ties and lip-ties as part of a differential diagnosis when an infant presents with signs of infant reflux. If it is found that these tissues restrict the infant from achieving a good latch, and they allow for ingestion of large amounts of air into the infant's belly, the tissue should be revised before more invasive procedures or the use of drugs to control the reflux are considered.

### Clinical examination revealed the following

This infant was seen at eight months of age and had the above-listed symptoms during the first eight months [17,18]. The breastfeeding history included all of the prior symptoms. Delayed growth both physically and neurologically, use of a variety of different pharmacologic medications, hospitalizations, and tests to rule out Crohn's disease, celiac disease, and genetic abnormalities.

Clinical evaluation of the lingual- and maxillary lip-ties indicated they were significantly tethered.

### Postsurgical results as reported by the infant's mother

The infant immediately latched the evening after revision; symptoms slowly resolved and by twelve months of age, the child was normal physically and neurologically [19].



**Figure 3:** Preoperative photo of maxillary lip-tie: The presurgical appearance of the maxillary lip-tie indicated the existence of a wide diastema due to a thick, fibrous frenum attachment. The attachment interfered with the upper lip from flanging upward thus causing a shallow latch and preventing the infant from achieving a tight latch.



**Figure 4:** The presurgical appearance of the infant's tongue attachment to the floor of the mouth indicated the tongue was unable to extend forward, upward, or laterally, thus limiting the tongue's ability to express milk efficiently from the mother's breast.



**Figure 5:** A photo of the infant after attempting to breastfeed shows the infant's belly distended with air due to the shallow latch and ingestion of air (aerophagia).

### Infant Obstructive Sleep Apnea

Infant sleep apnea should be a major concern and can be caused when an infant's tongue is tethered resulting in the tongue's resting position in the infant's airway [20,21]. This is often why an infant begins to gag whenever you place something such as a breast, a pacifier or a bottle into the infant's mouth. In effect these are blocking his or her airway.

This accounts for infants breaking their latch as soon as they begin to nurse. If the airway is blocked when the infant is sleeping on his or her backside, there is a potential for reduced oxygen flow to the brain and this is significant problem since during the early weeks the infant's brain and nervous system are growing at a rapid rate. Proper sleep and breathing determine health and development for the rest of an infant's life.

An infant sleeping with his or her mouth open, snoring or breathing with distress is something that needs to be fully evaluated. During an obstructive hypopnea, in comparison to an obstructive apnea, the airway is only partially closed.

Chronic airway-dependent breathing may be the stimulus to cause inflammation as well as regrowth of tonsil or adenoidal tissues.

Obstructive sleep apnea (OSA) in infants should be a significant concern for both the parents and health-care professionals. The results of OSA may express themselves as cognitive impairment, attention and hyperactivity disorders, poor academic achievement, disruptive behavior in school and cardiovascular and metabolic complications.

In many instances once the tethered tongue is released these symptoms will disappear.



Figure 6

Infants and adults who have difficulty in maintaining an open airway when resting will suffer from obstructive sleep apnea.

Enlarged tonsils or adenoids may contribute to dangerous mouth breathing. Ankyloglossia, or tongue-ties, should also be evaluated and treated when the airway is being obstructed.



Figure 7

**Evaluating infants for abnormal sleeping symptoms**

1. Pause between breathes that last 10–20 seconds or longer
2. Gasping for a breath
3. “Cute” snoring
4. Gagging

5. Face or body turning blue
6. Limp body
7. Slow heartbeat



**Figure 8**



**Figure 9**

**Infant’s clinical symptoms**

1. Lips apart-open mouth
2. Mouth breathing
3. Lateral borders of the tongue turned upward
4. Crease down center of the tongue
5. Tongue is not extending outward
6. Heart-shaped anterior border
7. Unable to elevate upward
8. Placing breast, pacifier, or bottle into mouth causes the infant to pull away
9. Compensatory breastfeeding
10. Self-weaning early
11. Adversarial mother-infant relationship that can last a lifetime!

**Clinical airway obstruction concerns for toddlers and older children**

Going to the dentist is not just about teeth, it is an examination of your child’s entire oral health, head, and neck structures as they relate to oral structures, because all of these can affect your child’s overall growth and development.

One part of an evaluation should include examining your child’s tonsils and visible upper airway for any abnormalities or problems.

The dentist should always be concerned with the upper airway and how it can effect oral shape and development of the upper and lower jaws. Medical science is also now becoming keenly aware that there is more to upper airway problems than just the development of the “long face” and malocclusions.

The diagnosis of asthma has been used many times when infants and young children are having breathing difficulties, children can be labeled as ADHD or ADD, and mental development can be effected when sleep apnea prevents adequate oxygen to reach your child’s brain, in some instances reducing the IQ by as much as ten points.

**Snoring is not cute. It represents a blocked airway**



*Figure 10*

Many parents think, when they peek in and listen to their infant sleeping and hear a snoring infant that it is cute. In fact, this is an indication that the airway is in some way being obstructed and may be a sign of future problems.

The following are the most common symptoms of obstructive sleep apnea. However, every child is different and symptoms may vary. Symptoms may include:

**Noisy breathing** during daytime or sleep

**Snoring**-any snoring or noisy breathing during sleep. (Perception is occasional snoring is okay)

Periods of not breathing—although the chest wall is moving, no air or oxygen is moving through the nose or mouth into the lungs. The duration of these periods is variable and measured in seconds.

**Mouth breathing**-the passage to the nose may be completely blocked by enlarged tonsils and adenoids leading to the child only being able to breathe through his/her mouth.

**Bloated bellies**-due to aerophagia (swallowing large amounts of air)

**Restlessness during sleep**-the frequent arousals lead to restless sleeping or “tossing and turning” throughout the night.

**Sleeping in odd positions**-the child may arch his neck backward (hyperextend) in order to open the airway or sleep sitting up.

**Behavior problems or sleepiness**-may include irritability, crankiness, frustration, hyperactivity, and difficulty paying attention.

**School problems**-children may do poorly in school, even being labeled as “slow” or “lazy.”

**Bed wetting**-also known as nocturnal enuresis, although there are many causes for bedwetting besides sleep apnea.

**Frequent infections**-may include a history of chronic problems with tonsils, adenoids, and/or ear infections.

**Allergies**-diagnosed with suspected allergies that may be due to restricted airways and breathing.

If a child has any of the above symptoms and a clinical appearance of airway blockage while being examined lying down, I recommend that a qualified ENT physician to evaluate the child’s tonsils and adenoids as well as a possible sleep study to determine if he or she has obstructive sleep apnea, sleep-disruptive disease, or sleep disorder symptoms. This problem is serious and may affect a child for a lifetime if not evaluated and if need be, corrected early.

Infants and mothers experiencing difficulties with breastfeeding, primarily due to an ineffective or poor latch due to Tethered Oral Tissue (Lip and Tongue –ties), experience many symptoms. Two symptoms, which are often misdiagnosed, air induced reflux and sleep apnea need to be part of the differential diagnosis when these symptoms present to the physician.

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