Infantile colic: Is a pain syndrome

Gardar Gudmundsson
Private Praxis, Kjalaland 30, Neurosurgeon, Reykjavik, Iceland

SUMMARY
The hypothesis states that infantile colic is a pain syndrome and the excessive crying leads to aerophagia and abdominal discomfort. The pain comes from sucking the bottle or the nipple. Feeding for the infant is a heavy workload for the masticatory muscles.

First, the tiny digastricus muscle moves the hyoid bone, takes part in opening the mouth and retrusion of the mandible and assists in mowing the tongue upward, forward and backwards. In the adult population pain from this muscle is well documented. The hypothesis explains the crying as being due to muscular pain at first, later on pain from the origins and insertions of the muscle. Then with increased muscular strength and development the pain fades away.

Introduction
Infantile colic was first described in 1894 and still today we have no agreement on the exact cause. The “rule of three” from 1954 is generally accepted as a definition of infantile colic: crying more than 3 h per day, for more than 3 days per week, and for more than 3 weeks in an infant that is well-fed and otherwise healthy [1]. The exact etiology of infantile colic is not well understood and may of course be multifactorial. The gastrointestinal tract has been suspected by many as harboring the cause and every parent of a colic infant focuses on the distended abdomen and the obvious abdominal discomfort the infant is showing and many therapeutic remedies target this.

Other causes as food allergy, flatulence, intestinal hormone abnormalities, parental factors and dysregulation of the nervous system have been suggested [2].

In a much cited article by Lucassen et al. Effectiveness of treatments for infantile colic: systemic review from 1998, the authors conclude that: “Infantile colic should preferably be treated by advising carers to reduce stimulation and with 1 week trial of hypoallergenic formula milk” [3]. Claiming that the care and stimulation of the infant may work to increase the symptoms but not excluding the possibility that the milk or milk substitute can make a difference.

They also point out that: “infants with colic are noted to show higher pitched, more turbulent cries following a feeding as indicated by cry acoustics” [6]. This could be symptoms of a pain syndrome. Feeding for the infant is directly painful and excessive crying is the obvious result from this.

The hypothesis
Feeding is a strenuous effort for the newborn infant. One can say that this is the only hard work they have to perform in the infant period. Sucking the bottle or the nipple is a well coordinated muscular activity and many muscles are involved. It is not easy to show exactly in which muscle there is most fatigue during feeding, but one muscle: the digastricus, is a very thin muscle with a demanding job and is the focus of my intention.

The digastricus muscle is a small muscle located under the under side of the jaw. It consists of two bellies united by a single ten-
don which is connected to the hyoid bone. The muscle originates from the posterior belly at the mastoid groove for the digastricus muscle and inserts by the anterior belly into the lower border of the mandible. The posterior belly is innervated by the facial nerve and the anterior belly is innervated by the mylohyoid nerve which branches from the trigeminal nerve. This muscle assists the mylohyoid and geniohyoid muscles in moving the hyoid bone and the tongue upward and forward and then upward and backward during the process of swallowing. The digastricus muscle is therefore taking part in sucking the nipple and then swallowing.

In the adult population this muscle can be the source of a very painful situation.

Travell and Simons have described clearly the symptoms arising from trigger points in the digastricus muscle.

The trigger points in the muscle spread pain and “soreness” to neighbouring structures. Trigger points from the posterior belly can radiate up to the sternocleidomastoid muscle, the throat in front of the muscle and sometimes onto the occiput. Trigger points in the anterior belly refer pain to the four lower incisor teeth and the alveolar ridge below them. Other symptoms are pain on swallowing.

Therapy is vapocoolant spray and stretch of the muscle and direct lidocain injection if the stretch therapy is insufficient [7].

In my practice as a neurosurgeon I have had some patients with what can be called “the digastricus syndrome”. Many of them have professions or hobbies that make heavy demand on the mouth and throat. Singers, waiters or other professions with heavy “vocal” demand are the most common.

My hypothesis is that infantile colic is a pain syndrome, rising mostly from the digastricus muscle but other muscles of the tongue, floor of mouth and throat can be involved. The infants mostly at risk are the ones with a muscle system that is not strong enough to meet the challenges of feeding. Muscle pain results. Gradually the muscles gain strength, but the origin and insertion may be painful for a considerable longer period. This is therefore a self-limiting condition.

Interestingly, crying itself may therefore be painful!

**Evaluation of the hypothesis**

1. Feeding for the infant is a demanding muscular effort. It has been demonstrated that during breastfeeding the infant has to build up negative pressure up to 98 mm Hg for 75 s prior to milk ejection. Breastfeeding is on the average 8 min and 6 times a day. Bottle feeding is of course less demanding [8].

2. Muscular pain comes from the overuse of muscle in the speaking population. The fact that the infant uses crying to communicate its dissatisfaction must not overshadow the fact, that it can be in real pain.

3. Chiropractors claim to be able to reduce symptoms of colic with spinal manipulation: In an article from 1999, Jesper et al. described a clinical trial where a short term spinal manipulation was significantly superior to medical treatment with Dimethicone (Dicyclomine). The spinal manipulation included motion palpation of the articulations of vertebral column and pelvis [9].

4. Searching the internet for remedies for infantile colic many forms of treatment seem to be available. Massage of various sorts, craniosacral therapy, Bowen Technique and others may be giving relief for infantile colic. If the treatment involves the neck and throat area, direct effect might be gained.

5. The consistence or texture of the milk formula: food allergy had been evaluated as a possible cause of infantile colic. In the “Infantile colic: a review” article by Leung et al. from 2002 this is given some thought. They find it possible that increased permeability to macromolecules could reflect an immature function of the gastrointestinal tract and thereby be a mechanism for food allergy. They refer to studies where changing from cows milk to a soy-milk formula or other milk formulas seemed to reduce crying time in infants, but they do not consider the consistence or texture of the milk in question, but for an infant with pain during swallowing this might make a difference [2].

**Consequences of the hypothesis**

Finding a cure for this self-limiting, benign but at times exhausting condition will spare the infant for a painful condition and give tired parents rest.

Treatment might be of 4 types, but first it must be strongly emphasized that the vicinity of the carotid artery and the vagus nerve and other important structure demands expert knowledge and care during the development of the best form for treatment.

1. Understanding of the condition and gentle massage of the muscles in question might in some cases be adequate treatment.

2. Medical treatment: pain killers or other drugs of the NSAID category may be useful. Topical ointment might help.

3. Manual therapy directed at the muscles and their origins and insertions.

4. Direct injections with lidocain into the muscular bellies. This of course is very difficult and should only be done under ultrasound guidance.

**Conflict of interest statement**

None declared.

**References**


