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What's new for the clinician?
- Excerpts from and summaries of recently published papers

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Compiled and edited by V Yengopal

1. The effects of frenotomy on breastfeeding and reflux

KW Slagter, GM Raghoebar, I Hamming, et al. Effect of frenotomy on breastfeeding and reflux: results from the BRIEF prospective longitudinal cohort study. Clin Oral Invest. 2021; 25: 3431-39.

INTRODUCTION

The World Health Organization (WHO) considers breast milk as the best source of nourishment for infants. Although exclusive breastfeeding is recommended up to 6 months of age, globally only 40% of children under this age are exclusively breastfed and this is mainly due to negative breastfeeding experiences.[1]

There are many different causes for negative breastfeeding experiences such as poor weight gain, necessitating supplementation, poor latch, maternal nipple pain, and oral restrictions like a tongue-tie (ankyloglossia) and/or lip-tie. Ankyloglossia (either the decrease in mobility for the tongue by classic anterior tongue-tie or a submucosal restriction, a posterior tongue-tie) and a superior tethered labial frenulum can cause altered latch and sucking mechanics.[1] Studies have shown that show that a frenotomy, if adequately performed, can improve breastfeeding scores and relieve nipple pain with little or no serious complications.

Another factor associated with breastfeeding difficulties is gastroesophageal reflux. Gastroesophageal reflux is a common phenomenon in infants, but the differentiation between gastroesophageal reflux and gastroesophageal reflux disease can be difficult.[1] Symptoms of reflux are non-specific, and there is increasing evidence that the majority of symptoms may not be acid-related. In children with infant gastroesophageal reflux symptoms, clinical improvement has been suggested following a frenotomy of a tongue-tie.[1]

Slagter and colleagues (2021)[1] reported on a longitudinal study that sought to assess Breastfeeding and Reflux Improvement by the Efficacy of a Frenotomy (BRIEF) in infants with breastfeeding problems up to 6 months after treatment. Breastfeeding self-efficacy for mothers was used as the primary outcome measure. Secondary outcome measures were nipple pain during breastfeeding, gastroesophageal reflux symptoms, and complications up to 6 months after treatment.

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MATERIALS AND METHODS

Participants were 175 eligible consecutive breastfeeding women with healthy infants under 6 months with breastfeeding problems. The 175 eligible women were from a group of 338 women referred by external general practitioners. The other 163 mothers were not considered eligible for this study because their infants were premature, twins, or were already revised for tethered maxillary labial frenulum (upper lip-tie) and/or ankyloglossia (n=84), their infants received exclusively formula (n=41), or their infants not seem to have oral restrictions (n=38).

Before enrolment into the study, a structured medical background history of mother and infant, pregnancy, birth, and breastfeeding history was done. For the infants, the oral examination consisted of reporting sucking blisters, shape of the palate, retrognathia, location of attachment of the frenula, blanched frenula with elevation, anatomical restriction of elicited lateral lingual movement (impaired transverse tongue reflex), abnormal floor of mouth elevation of the tongue, and presence of thrush. The sucking evaluation consisted out of the notification of abnormal gum/lip pressure, cupping of the tongue against the finger, seal on the finger, and the nature of the sucking tongue movements. Their mothers were assessed for usual causes of breast or nipple pain such as nipple damage (abnormal latch/suck dynamic or breast pump trauma/misuse), dermatosis infection, and vasospasm.

The frenotomy procedure was standardized by using an electrosurgical procedure. Topical anaesthetic cream (xylocaine 5%) was applied with a cotton swab on the surgical site. A dispersive electrode was placed under the patient. The tongue was elevated while the tip of the active electrode was applied to the frenulum. Regarding (anterior) tongue-tie releases, midline tissue was incised starting at the anterior edge of the frenulum. An approximately

1-mm-deep central window was incised in the mucosa overlying the genioglossus muscle. The window in the mucosa was then extended laterally on both sides to release the mucosa, taking care not to disturb the fascia of the underlying genioglossus muscle. The appearance of a diamond-shaped wound was considered as a full release. Upper lip-tie releases were performed by lifting the upper lip, while the maxillary labial frenulum was released off the alveolar ridge up to the mucogingival junction. Immediately after the procedure, the infant was offered the breast or breastmilk by a bottle. Post procedural stretching exercises were advised to avoid reattachment of tissue by gently elevating the tongue and upper lip and massaging the wound four times per day for several weeks. Acetaminophen 60-120 mg suppository max 3 times per day was advised for analgesia if needed.

The infants were assessed at 1 week, 1 month, and 6 months after intervention via electronic correspondence using an Internet-based compliant survey portal (Typeform). All infants were followed clinically as per the office protocol. According to protocol, all patients had a routine follow-up after 1 week. When symptoms persisted or worsened following initial improvement, the mothers were offered a second procedure when a restriction was identified. During every follow-up visit, a routine assessment for post-operative complications was performed.

Breastfeeding self-efficacy was measured using the validated Breastfeeding Self-Efficacy Short Form (BSES-SF). BSES-SF is a 14-item survey rated on a five-point Likert-type scale. The Likert scale ranged from 1 = "not at all confident" to 5 = "always confident." Sum scores were calculated with a range from 14 to 70, with higher scores indicating higher levels of breastfeeding self-efficacy.

To evaluate nipple pain with breastfeeding, the pain score was measured with the Visual Analogue Scale (VAS) with a range from 0 to 10 with 0 = "no pain" to 10 = "severe pain." Infant gastroesophageal reflux was measured using the validated Infant Gastroesophageal Reflux Questionnaire Revised (I-GERQ-R). I-GERQ-R is a 13-item survey with strong internal consistency designed to evaluate the severity of gastroesophageal reflux symptomatology. The I-GERQ-R utilizes ordinal response scales to measure the severity of symptoms associated with infant gastroesophageal reflux disease (GERD). Scoring involves the summarization of 12 items (score range, 0-42), where lower scores reflect lower symptom severity.

Besides the study related outcomes, in addition, development in motor and cognitive growth after 6 months' post-surgery was assessed. Participating parents were asked to complete out questionnaires within 1 week by mail. Participants were excluded from the analysis if the 6 months' questionnaires were missing.

RESULTS

The study sample consisted out of 175 eligible breastfeeding women with healthy infants out of 338 woman visiting the clinic during the study period. After 6 months, 146 patients were included in the analyses; 29 patients were lost to follow-up. All patients but one received both a tongue-tie release and a frenotomy. Eight (4.6%) patients needed a second lingual frenotomy within 1 month after the initial treatment for either lack of improvement of symptoms or recurrence of symptoms after initial improvement.

Frenotomy improved BSES-SF, I-GERQ-R, and VAS nipple pain scores significantly after 1 week. This improvement was still significant 1 month after treatment for both BSES -SF and I-GERQ-R. Six months after treatment, I-GERQ-R scores remained significantly better in the 49 infants that presented with gastro-oesophageal symptoms at baseline. More importantly, 60.7% of infants still received breastmilk 6 months after treatment.

No post-operative complications were observed. In addition, motor and cognitive development was normal in all patients. In one (0.7%) patient there was temporary hyper granulated tissue of the wound. The majority of infants needed little, if any, analgesia post treatment.

CONCLUSIONS

the researchers concluded that Frenotomy of a tongue-tie and or lip-tie is a safe procedure with no reported post-operative complications after 6 months. Surgical release of the tethered oral tissues was shown to result in significant improvement of breastfeeding self-efficacy, nipple pain, and gastroesophageal reflux problems. Improvements occur early (1 week postoperative) and continue to improve to 6-months postoperative.

Implications of practice

Clinicians should encourage patients with newborns to visit their dentists to check for the presence of either anterior and/or posterior tongue-tie/s as these could potentially cause breastfeeding difficulties.

Reference

1. Slagter KW, Raghoebar GM, Hamming I, et al. Effect of frenotomy on breastfeeding and reflux: results from the BRIEF prospective longitudinal cohort study. Clin Oral Invest. 2021; 25: 3431-9.

2. Buffered 2% articaine versus non-buffered 4% articaine in maxillary infiltration: randomized clinical trial

KS Amorim, VTS Fontes, AC Gercina, et al. Buffered 2% articaine versus non-buffered 4% articaine in maxillary infiltration: randomized clinical trial. Clin Oral Invest. 2021; 25: 3527-33.

INTRODUCTION

The molecular structure of all local anesthetics consists of 3 components: (a) lipophilic aromatic ring, (b) intermediate ester or amide linkage, and (c) tertiary amine. Clinical local anesthetics (LAs) belong to one of two classes: aminoamide and aminoester LAs. LAs are bases compound, weak soluble in water, and unstable when exposed to the air. In order to make feasible their injection, these bases are combined with hydrochloric acid to form local anaesthetic salt, in which form they are quite soluble in water and comparatively stable, becoming mostly a solution with an approximate pH of 5.9.[1]

Usually, epinephrine is added into local anesthetics solution at a ratio of 1:100,000 or 1:200,000 to balance blood vessel dilatation, leading to blood vessel constriction at the site of application, prolonging anaesthesia duration. However, the sodium bisulphite is added as an antioxidant to stabilize that kind of vasoconstrictor, which makes the solution even more acidic (pH approximately 3.5). Injection of these acidic solutions may consequently present negative effects, such as burning, some degree of tissue injury, relatively slow-onset anaesthesia, and unsatisfactory activity in the presence of infection and inflammation (even lower pH).[1] To compensate for the low pH, the organism itself performs a physiological buffering mechanism, which takes time and directly influences the onset of local anaesthetic action.[1] Another alternative for changing the pH of the local anaesthetic solution is to buffer it with sodium bicarbonate. Increasing the pH of the solution to the approximate to physiological pH (around 7.4) can result in the elimination of injection burning, reduction of tissue injury, and onset time.[1]

Amorim and colleagues (2021)1 reported on a trail that sought to compare the anaesthetic effect of 2% buffered articaine hydrochloride with 4% non-buffered articaine, regarding onset and length of pulpal and soft tissue anaesthesia, and pain during injection.

MATERIALS AND METHODS

This was a controlled, randomized, crossover, triple-blind clinical trial. The test solution was contained a 2% articaine hydrochloride solution with 1:200,000 epinephrine and 0.84% sodium bicarbonate (buffer) The control solution (solution 2), was a commercially used 4% articaine hydrochloride solution containing 1:200,000 epinephrine.

The manipulation of the solutions occurred exclusively and immediately before performing the procedure. Therefore, the content remained sterile due to the preparation conditions. To guarantee the blinding, the same researcher prepared the solutions alone, in other environment either from the volunteer or from the operator who only performed the anaesthesia. Moreover, both solutions (commercial and buffered) were delivered directly to the researcher who executed the anaesthesia, already coupled to the carpule syringe wrapped in sterile paper. Therefore, none of the researchers or patients was able to identify the solutions used during this study.

The inclusion criteria were healthy individuals aged over 18 years, a similar level of education (able to respond to the Visual Analog Scale-VAS), previous experience of local anaesthesia, no history of complications due to ocal anaesthesia, and presence of healthy upper canines responsive to “pulp tester” electrical stimulation. Volunteers who met any of the following conditions were excluded in the study: pregnancy, breastfeeding, systemic impairment, which contraindicated anaesthesia, history of an allergic reaction to any component of the used anaesthetic solutions, and patients that could present risk or interference on pulp tester response such as volunteers under orthodontic treatment or with extensive restorations in the upper canines.

Information about the study was explained to each volunteer prior to local anaesthetic injection and they were blinded to the anaesthetic agent used.

For oral supraperiosteal injections, the needle injected the anaesthetic solution without touching the bone to minimize pain. The anaesthetic injection speed was always 1 mL/min. All participants received supraperiosteal injections of 1.8 mL of local anaesthetic (1 cartridge) performed by the same operator.

This study was carried out in two sections. To establish the order of which solution would be administered in each section, the researchers used a randomization worksheet taking into consideration patient one to patient forty-two and the two solutions in two different sections without repeating the same solution. In one of the sections, the participants randomly received supraperiosteal buccal anaesthesia in the upper canine apex with solution 1 (2% buffered articaine with 1:200,000) or solution 2 (4% articaine 1:200,000 epinephrine). In the second section, the participants received the supraperiosteal buccal anaesthesia in the upper canine apex with the remaining solution, and then all patients received both solutions.

To assess the onset and length of pulpal anaesthesia, an electrical pulp test device (Pulp Tester Digital TP-10) was used. For evaluation of onset and length of soft tissue anaesthesia, calibrated nylon filaments with the predetermined force of 300 gf (SORRI® Esthesiometer Kit) were applied against the gum until deflection and then it was observed if the volunteer reported any painful sensation.

At the end of each session, the volunteers were asked about the pain during injection and registered it in the visual analog scale (VAS).

In addition, a pH meter device measured the pH of the solutions with nine different vials of each solution: solution 1, solution 2, and the 4% articaine with 1:100,000 epinephrine solution used to obtain the solution 1.

RESULTS

This study involved 42 health volunteers; most of them were women (28) aging from 19 to 28 years old, with a mean of 20 years old. There was no difference between the two anaesthetic solutions (onset of soft tissue anaesthesia, p=0.5386; length of soft tissue anaesthesia, p=0.718; onset of pulpal anaesthesia, p=0.747; length of pulpal anaesthesia, p=0.375), except for pain during the injection which was lower when buffered 2% articaine was used (p=0.001) and the pH. The pH analysis revealed that the solutions differed from one another (p<0.01).

CONCLUSIONS

The researchers concluded that the buffered 2% articaine with 1:200,000 epinephrine presented onset and length of pulp and soft tissue anaesthesia similar to 4% articaine with 1:200,000 epinephrine. Furthermore, the buffered 2% articaine with 1:200,000 epinephrine solution provided less pain during injection.

Implications for practice

With the absence of pain being a noted practice builder, clinicians should take note of these findings that may contribute to their patients' stress and pain free experience when presenting for dental treatment.

Reference

1. Amorim KS, Fontes VTS, Gercina AC, et al. Buffered 2% articaine versus non-buffered 4% articaine in maxillary infiltration: randomized clinical trial. Clin Oral Invest. 2021; 25: 3527-33.

Do the CPD questionnaire on page 383

The Continuous Professional Development (CPD) section provides for twenty general questions and five ethics questions. The section provides members with a valuable source of CPD points whilst also achieving the objective of CPD, to assure continuing education. The importance of continuing professional development should not be underestimated, it is a career-long obligation for practicing professionals.

Online CPD in 6 Easy Steps

1 Go to the SADA website www.sada.co.za.
2 Log into the 'member only' section with your unique SADA username and password.
3 Select the CPD navigation tab.
4 Select the questionnaire that you wish to complete.
5 Enter your multiple choice answers. Please note that you have two attempts to obtain at least 70%.
6 View and print your CPD certificate.