

## Review article

### Ankyloglossia in the Infant and Young Child: A Review

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#### Abstract

The lingual frenulum is an anatomic structure that plays an important role in the act of suction, feeding and speech. Ankyloglossia or tongue-tie is the result of a short, tight, lingual frenulum. Prevalence of ankyloglossia ranges from 0.2-10.7% worldwide. Ankyloglossia causes difficulty in feeding in neonate and speech problem due to limitation in tongue movement. A thorough intraoral examination of the tongue's appearance should be performed on the infant. For assessment of the tongue in young children clinical and phonetic examination should be carried out. As ankyloglossia causes several difficulties in early and late life, early diagnosis is encouraged for prompt treatment. In this present article we have summarized the literature review for prevalence, consequences and clinical assessment of ankyloglossia in the infant and young child.

Keywords: Lingual Frenum, Tongue- Tie, Breast feeding Problems, Ankyloglossia.

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#### Introduction:

The lingual frenulum, or the tongue's frenulum, connects the tongue to the floor of the mouth, allowing tongue's free movement in the oral cavity. Lingual frenulum is formed by a dense fibrous conjunctive tissue and, often, by superior fibres of the genioglossus muscle. The lingual frenulum migrates towards a central position to occupy its definitive position along with the growth and development of bone and eruption of tooth.<sup>[1]</sup> Histologically, the lingual frenulum is composed of a connective tissue rich in collagen and elastic fibres, with some muscular fibres, blood vessels,

and fat cells, covered by a stratified pavementous epithelium.<sup>[2]</sup>

Ankyloglossia (AG), also known as tongue-tie, is a developmental anomaly characterized by short, thick lingual frenulum connecting abnormally to the tongue and the floor of the mouth. This may result in limitations of tongue movements, leading to speech and deglutition difficulties. Severity of lingual frenulum attachment may vary from case to case. AG might be characterized by mucous membrane bands at frenulum attachment which may be categorized mild, moderate and severe AG. Severe

cases of AG characterised by complete ankyloglossia caused by the tongue adhered to the floor of the mouth.

### Prevalence

Prevalence of ankyloglossia ranges from 0.2-10.7% worldwide. Prevalence rate ankyloglossia in different countries are illustrated in Table 1.

pain or difficulties getting their babies to latch at 6 weeks, but 25% of mothers of babies with ankyloglossia have these problems.<sup>[15]</sup>

### Clinical assessment in infant

A thorough intraoral examination should be performed on the infant. Inspection of the tongue and its function should be part

**Table 1:** Prevalence of Ankyloglossia worldwide

| Author                               | Country  | Year | N    | Prevalence (%) |
|--------------------------------------|----------|------|------|----------------|
| Ballard JL, et al. <sup>[3]</sup>    | USA      | 2002 | 3036 | 4.2            |
| Ugar-Cankal D, et al. <sup>[4]</sup> | Turkey   | 2005 | 906  | 1.3            |
| Ricke LA, et al. <sup>[5]</sup>      | USA      | 2005 | 3490 | 4.2            |
| Hogan M, et al. <sup>[6]</sup>       | UK       | 2005 | 1866 | 10.7           |
| Koay CL, et al. <sup>[7]</sup>       | Malaysia | 2011 | 600  | 1.7            |
| Rai R, et al. <sup>[8]</sup>         | India    | 2012 | 1800 | 0.2            |
| Patil S, et al. <sup>[9]</sup>       | India    | 2013 | 4926 | 3.5            |

### Consequences

The existence of ankyloglossia in the new-born may result in various problems which may affect both mother and infant including compromised feeding. The breastfeeding difficulties include ineffective latch, inadequate milk transfer, and maternal nipple pain. This difficulty is caused as infant compresses the nipple against the gum pad instead of the tongue.<sup>[10]</sup> Messner<sup>[11]</sup> studied feeding difficulties in AG and concluded that mothers breastfeeding infants with ankyloglossia have more nipple pain than mothers feeding normal infants. Tait<sup>[12]</sup> and Henderson A et al<sup>[13]</sup> concluded that prevalence of nipple pain is between 60% and 80% in all nursing mothers of neonate with AG during the early postpartum period. With normal infants, this pain is transient, peaks on the third day, and resolves spontaneously within 2 weeks.<sup>[14]</sup> The prevalence of persistent nipple pain in breastfeeding women whose infants have ankyloglossia is between 36% and 80%. Only 3% of mothers of normal infants have intractable

of the routine first dental visit. The clinician should examine the tongue's appearance when the tongue is lifted as the infant cries or tries to extend the tongue.<sup>[14]</sup> While lifting the infant's tongue, the frenum should be palpated and its elasticity should be determined. The attachment of the frenum to the tongue should normally be approximately 1 cm posterior to the tongue's tip. The frenum's attachment to the inferior alveolar ridge should be proximal to or into the genioglossus muscle on the floor of the mouth.

Parents should be advised regarding the presence and severity of AG and made aware of potential feeding, speech, and dental problems.<sup>[14]</sup> The mother should be interviewed regarding the infant's ability to breastfeed. If any of these factors are present, a lactation specialist should be consulted for breast-feeding assessment.

- Does the infant demonstrate frustration at the breast?
- Is the infant experiencing in ability to sustain a good latch to the nipple?

- Does the mother experience any nipple pain or discomfort while the infant nurses?

**Clinical assessment in preschool/school-age patient**

AG does not prevent or delay the onset of speech, but may interfere with articulation. Williams WN, et al<sup>[16]</sup> has suggested a simple speech articulation test. If the elevation of the tongue tip is restricted, the articulation of one or more of the tongue sounds—such as “t,” “d,” “l,” “th,” and “s”—will not be accurate. Patients who have difficulty should be referred to a speech pathologist for evaluation. Ballard JL<sup>[3]</sup> advocated that AG is not a cause of speech delay. Children with AG are expected to acquire speech and language at a normal rate, although some may experience articulation difficulties for certain speech sounds, as previously indicated.

Several suggestions have been made in the literature regarding a systematic protocol for AG assessment, lingual function, and need to for surgical corrections which are illustrated in Table 2.

its insertion, helps in diagnosis of the anomaly. The abnormal frenulum attachment of tongue alters the deglutition function, tongue’s movements, speech, and word’s articulation. For accurate diagnosis of AG in infant, it should involve clinical and mother’s breast feeding assessment; and for preschooler’s clinical and phonetics assessments should be done.

First dental visit should include a thorough examination of tongue and its frenulum attachments. If any abnormality diagnosed, should be discussed with parents. Parents should be made aware of possible sequel and problems associated with AG. Frenotomy can be performed in dental clinical which does not require general anaesthesia (GA) in early stages. Hence the early diagnosis helps to plan corrective measurements with the best possible outcome.

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**Table 2:** Criteria for Ankyloglossia assessment

| Authors                                 | Year | Criteria                                                                                                                                                                                 |
|-----------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fleiss P, et al. <sup>[17]</sup>        | 1990 | Tongue tip cannot reach top of gums; tongue tip cannot swing from one corner of mouth to the other; tongue displays notching when protruded; tongue cannot be protruded beyond lower gum |
| Harris E, et al. <sup>[18]</sup>        | 1992 | Frenulum short, thick, and fibrous; frenulum extends to the papillated surface of tongue                                                                                                 |
| Hazelbaker A. <sup>[19]</sup>           | 1993 | Function and appearance items tool for assessment                                                                                                                                        |
| Kotlow LA <sup>[20]</sup>               | 1999 | Classification of Ankyloglossia Based on “Free Tongue” Length                                                                                                                            |
| Messner A and Lalakea M <sup>[21]</sup> | 2000 | Frenulum abnormally short; decreased mobility of tongue tip                                                                                                                              |
| GriffithsD <sup>[14]</sup>              | 2004 | Frenulum thick; tongue heart-shaped when protruded                                                                                                                                       |
| Hogan M, et al <sup>[22]</sup>          | 2005 | Frenulum extending along 25%-100% of tongues’ total length                                                                                                                               |

**Conclusion**

The routine examination of the lingual frenulum enables to find abnormalities in

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