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# Ankyloglossia in the Gambia; A Cause for Concern?

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**Abstract:** **Background**: Ankyloglossia (AG) is the presence of a short lingual frenum that interferes with normal tongue movement. Prevalence has been estimated to be from less than 1% to 10%. This significant wide range can be attributable to the lack of diagnostic criteria for AG. It is believed that there has been no published study done on the prevalence of Ankyloglossia in the EFSTH or in the Gambia which anecdotical appears to be unusually common and this has informed this prospective study. **Objective**: To determine the prevalence of tongue tie amongst patients attending the oral and maxillofacial clinics in Edward Francis Small Teaching Hospital (EFSTH) from January 2018 to January 2019. **Methods**: This is a retrospective descriptive study which was conducted at the oral and maxillofacial clinic of EFSTH from January 2018 to January 2019. The inclusion criterion is all the patients who presented with Ankyloglossia at the oral and maxillofacial clinic and exclusion criteria include those with incomplete records. **Results**: The study revealed that a total of 44 children with ankyloglossia were seen within the period of study. Which is 10.1% of all the patients seen at the oral and maxillofacial surgery clinic within the study period. 66% of the patients were males. Children between 0-12 months of age accounting for 50%, 13-36 months of age were 25%, while those of ≥109 months accounted for 11.4%, followed by 37-72 months and 73-108 months each accounting to 6.8% respectfully. The study also revealed that majority of those with AG was residing in Kanifing municipal counsel and Brikama area counsel accounting 48% and 45% respectively. The others were residing in Banjul municipal counsel and other areas accounting 6% and 2% respectively. The study has shown that most of those with Ankyloglossia were born by parents of younger age group, ranging 25-35 years. Our study also shows that only 2% of those with ankyloglossia presented with other associated birth defects while 89% presented with difficulty in breastfeeding. **Conclusion**: Tongue-tie affects a considerable number of infants and children in the Gambia. However, it is important that accurate information and guidance is given to parents with regard to the indications and potential benefits of awareness of the presence tongue-tie and the need for early surgical treatment to prevent malnutrition and possible speech defect.

**Keywords**: Prevalence, Ankyloglossia, frenulosplasty, Frenotomy

## INTRODUCTION

Ankyloglossia, also known as tongue-tie, is a short lingual frenum that interferes with normal tongue movement. Prevalence has been estimated to be from less than 1% to 10%. This

significant wide range can be attributable to the lack of diagnostic criteria for tongue-tie (1) (2)(3)(4)(5)

There is no standard definition of ankyloglossia, and multiple classifications exist. When examined, the ‘free tongue’ length in newborns should be greater than 16 mm. Measurements of less than 11 mm indicate moderate ankyloglossia and less than 7 mm indicates severe ankyloglossia. However, this measurement may not be useful in infants. The term posterior ankyloglossia is used when the frenulum is attached at the middle to the posterior aspect of the undersurface of the tongue. Taking into consideration the anatomy and function, there are many assessment tools for classification.

One of them is the Hazelbaker Assessment for Lingual Frenulum Function . This tool uses a scoring system using anatomy and function.

Ankyloglossia represent a typical interdisciplinary problem concerning different specialties in dentistry, ranging from periodontology to oral surgery, with no generally accepted classification or treatment strategy available. In daily clinical practice, tongue tie are of important for the dental Surgeon because they are frequent finding in patients(9) a significant association between frenal involvement and gingival recession has been reported in the literature (10).

Tongue-tie sometimes runs in families. An association between Ankyloglossia and some syndromes, such as x-linked cleft palate syndrome, was reported in the literature (2)].

Ankyloglossia was also diagnosed in some cases of other rare syndrome, such as Kindler syndrome, Van Woude syndrome, and Optiz syndrome (2,10).Nevertheless, most Ankyloglossia are observed in persons without any other congenital anomalies or disease.

The consumption of cocaine during pregnancy is another factor that seemed to predispose to Ankyloglossia in neonates (25)(26).

A commonly employed criterion was the frenulum being abnormally short and thick, which caused the tongue to become heart-shaped upon protrusion. Criteria also included signs of functional impairment, such as an inability to protrude the tongue past the gum line, and other indications of decreased tongue mobility.

Signs and symptoms of tongue-tie include: Difficulty lifting the tongue to the upper teeth or moving the tongue from side to side, trouble sticking out the tongue past the lower front teeth and  a tongue that appears notched or heart shaped when stuck out.

Tongue-tie can affect a baby's oral development, as well as the way he or she eats, speaks and swallows. For example, tongue-tie can lead to:

**Breast-feeding Problems**

Breast-feeding requires a baby to keep his or her tongue over the lower gum while sucking (27)(28)(29). If unable to move the tongue or keep it in the right position, the baby might chew instead of suck on the nipple. This can cause significant nipple pain and interfere with a baby's ability to get breast milk. Ultimately, poor breast-feeding can lead to inadequate nutrition and failure to thrive (30)(31)(32) (33).

**Speech Difficulties**

Tongue-tie can interfere with the ability to make certain sounds — such as "t," "d," "z," "s," "th," "r" and "l." (1)

**Poor Oral Hygiene**

For an older child or adult, tongue-tie can make it difficult to sweep food debris from the teeth. This can contribute to tooth decay and inflammation of the gums (gingivitis). Tongue-tie can also lead to the formation of a gap or space between the two bottom front teeth.

**Challenges with other Oral Activities**

Tongue-tie can interfere with activities such as licking an ice cream cone, licking the lips, kissing or playing a wind instrument (38)(12).

Mothers' breastfeeding infants with ankyloglossia have more nipple pain than mothers feeding normal infants. (11) The prevalence of nipple pain is between 60% and 80% in all nursing mothers during the early postpartum period (9)(48)(33), With normal infants, this pain is transient, peaks on the third day, and resolves spontaneously within 2 weeks(26)(30). 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 pain or difficulties getting their babies to latch at 6 weeks, but 25% of mothers of babies with ankyloglossia have these problems (3) other consequences are speech disorder and poor oral hygiene due to limited movement of the tongue .Tongue-tie is typically diagnosed during a physical exam. For infants, the doctor might use a screening tool to score various aspects of the tongue's appearance and ability to move.

The most common treatment of infant ankyloglossia is simple frenotomy. Frenotomy is accomplished by incising several millimeters into the lingual frenulum. This procedure is brief and usually bloodless and is described in detail in a recent position paper from the American Academy of Pediatrics on the effect of tongue-tie on breast feeding (10). Hemostasis, if needed, is achieved by breastfeeding, which also lengthens the tongue and acts as an analgesic and antiseptic (39)(2) (40). There are a variety of accepted frenotomy techniques. Newborn frenotomies are usually provided with either scissors or laser and without local or general anaesthetic [24,27,28]. All frenotomies at the Oral Surgery clinic, EFSTH were completed with sterile blunt ended scissor incisions. Local anesthesia was used in older children that needed a more extensive incision. and expressed breast milk was used for analgesia and sucking of the breast aided haemostasis were needed.

Complications historically attributed to frenotomy include infection, hemorrhage caused by severance of the lingual artery, and asphyxia caused by the released tongue falling back into the airway (16)(17). In recent years, there has been a renewal of interest in frenotomy as a treatment for ankyloglossia and an exploration of the complications associated with the procedure in the modern era, which are negligible(18)(19) .

A more extensive procedure known as a frenuloplasty might be recommended if additional repair is needed or the lingual frenulum is too thick for a frenotomy (21).This is done under general anesthesia with surgical tools. After the frenulum is released, the wound is usually closed with sutures that absorb on their own as the tongue heals . Possible

complications of a frenuloplasty are similar to a frenotomy and are rare — bleeding or infection, or damage to the tongue or salivary glands. Scarring is possible due to the more extensive nature of the procedure, as are reactions to anesthesia. After a frenuloplasty, tongue exercises might be recommended to enhance tongue movement and reduce the potential for scarring(7).

Aim and Objectives: To identify the prevalence of ankyloglossia and the management outcome so as to allow the establishment of the protocol for management of ankyloglossia and also to influence the Government on appropriate policy making for intervention at the primary health level of the community.

There seems to be a significant burden of tongue tie in The Gambia anecdotally but there is no available data to support this. Theoretically, Ankyloglossia is said to be a rare condition globally. We aim to determine the prevalence of tongue tie amongst patients attending the oral and maxillofacial clinics in Edward Francis Small Teaching Hospital (EFSTH) from January 2018 to January 2020.

And also, to identify the sociodemographic variables amongst the set patients with tongue tie attending the pediatric clinics and oral and maxillofacial clinic. And to determine possible relation between sociodemographic factors and the prevalence of tongue tie amongst patients attending the pediatric and maxillofacial clinic. We identified the treatment outcome in patients and the principal complications.

## MATERIALS AND METHOD

A retrospective descriptive study was conducted at the pediatric and maxillofacial clinic of EFSTH from January 2018 to January 2019. A pilot prospective study of ten of the patients and their mothers in order to assess the consequences of tongue-tongue related to painful breastfeeding, speech and other complications and the findings was done and the findings are included in the present study.

Record of all those who attended the oral and maxillofacial clinics or department with diagnosis of AG from January 2018 to January 2019 was enrolled in the study. Data was obtained from patient's case files (folders) and convenience sampling was used for the selection of patients to be included in the study.

Case files (folders) of patient's diagnosed of ankyloglossia in the oral and maxillofacial clinic of Edward Francis Small Teaching Hospital (EFSTH) was used. Incomplete records and those who do not report to EFSTH. Patients who refused to cooperate in the study were the exclusion criteria. A data collection tool was used to extract the information from the patient's case files (folders).

The data collected was analyzed using MS excel, Statistical Package for Social Sciences SPSS (V20) and presentation into charts, tables. Quantitative data is presented in mean ±SD and qualitative data in frequency and percentages. The chi square was be used and a p-value $<0.05$ is considered to indicate statistical significance

The ethical clearance to undertake this study was received from the ethics committee of EFSTH and also to the department of Surgery and pediatric to seek consent to conduct the study in their department. Maximum confidentiality was maintained.

## RESULTS

**Table 1: Demographic factors in the patients diagnosed of Ankyloglosia.**

| Variables | Demographic Factors | | |
|---|---|---|---|
| | Category | Frequency | Percentage |
| Gender | Male | 29 | 65.9% |
| | Female | 15 | 34.1% |
| | Total | 44 | 100% |
| Age | ≤12 Months | 22 | 50.0% |
| | 13-36 Months | 11 | 25.0% |
| | 37-72 Months | 3 | 6.8% |
| | 73-108 Months | 3 | 6.8% |
| | ≥ 109 Months | 5 | 11.4% |
| | Total | 44 | 100% |
| Family History | Yes | 6 | 13.6% |
| | No | 38 | 86.4% |
| | Total | 44 | 100% |
| Tribe | Mandinka | 12 | 27.3% |
| | Fula | 11 | 25.0% |
| | Wollof | 11 | 25.0% |
| | Jula | 2 | 4.5% |
| | Others | 8 | 18.2% |

A total of 435 patients presented to the Oral and maxillofacial outpatient clinic within the period of the study, out of which 44 of them had Ankyloglossia which is a prevalence of 10.1%. Table 1 depicts the percentages of male and female with Ankyloglossia of the 44 study participants, more male 66% (29\44) were found to have this disease condition.

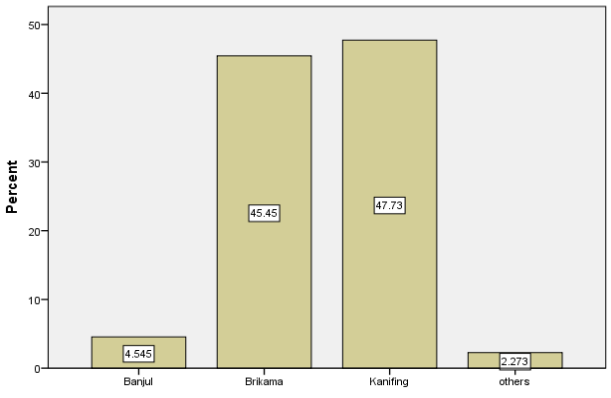


**Figure 3: percentage distribution according to place of residence with Ankyloglossia from January 2018 to January 2019 in Edward Francis Small Teaching Hospital.**

Out of the study participants in the figure above, the most affected age group was 0-12 months (50%), followed by 13-36 months (25%). The least affected age groups were 37-72 months and 73-108 months (7%) (9%) respectively

Out 44 participants of the study, most the participants have no associated family history 86% (38\44). Only 14% (6\44) had associated family history.

Out of the study participants, most of the tribe affected with condition was the Mandinkas 27% followed the Fulas and the Wollof each 25% respectively. Then the others were 18% followed by the least affected tribe being Julas 5%.

The bar chart above shows that the condition is higher among participants from Kanifing municipality 48% (21\44) followed by participants from Brikama municipality, 46% (20\44). Low percentages were seen from two municipalities; 5% and 2% respectively.

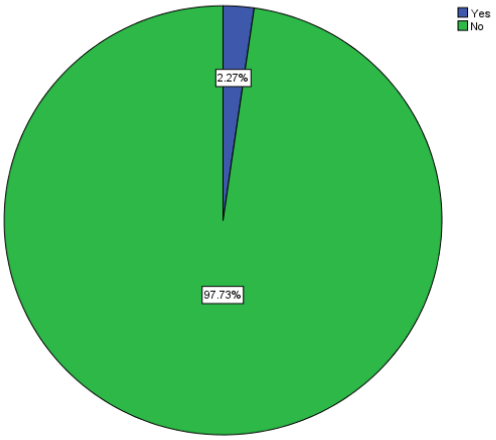


Figure 5: Percentage distribution according to birth defect in Ankyloglossia from January 2018 to January 2019.

The figure above shows that, most of the participants,98% (43\44) had no birth defect while only a few 2% (1\44) had a birth defect.

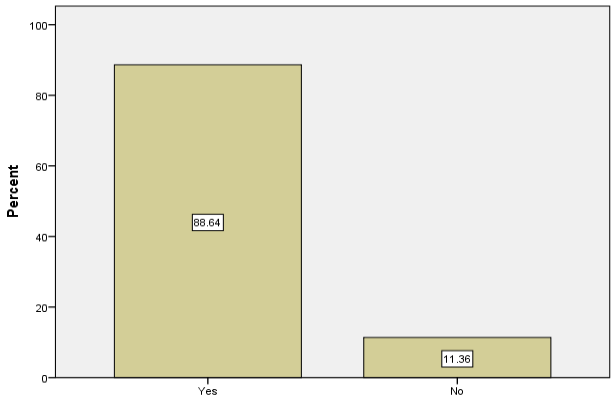


**Figure 6: Percentage distribution according to the presence of difficulty in breastfeeding in Ankyloglossia from January 2018 to January 2019.**

The bar chart above depicts that most of the participants presented with difficulty in breastfeeding 89% (39\44).

Out of the 44 participants 22 of them were those less than 12 months old whom I could not assessed the speech difficulty because they do not attain speech yet.

The remaining half who attained speech had only 15 of the participants who had difficulty in speech accounting to 68%.

**Table 4: Percentage distribution according to speech difficulty in Ankyloglossia from January 2018 to January 2019.**

| Who could not be assessed for difficulty in speech | | Who presented with speech difficulty | | |
|---|---|---|---|---|
| Less 12 months | Total of 22 of 44 participants | Greater or equal to 12 months | Total of 22 out of 44 participants | |
| | | Who had difficulty in speech | 15 | 68%) |
| | | No difficulty in speech | 7 | (31%) |

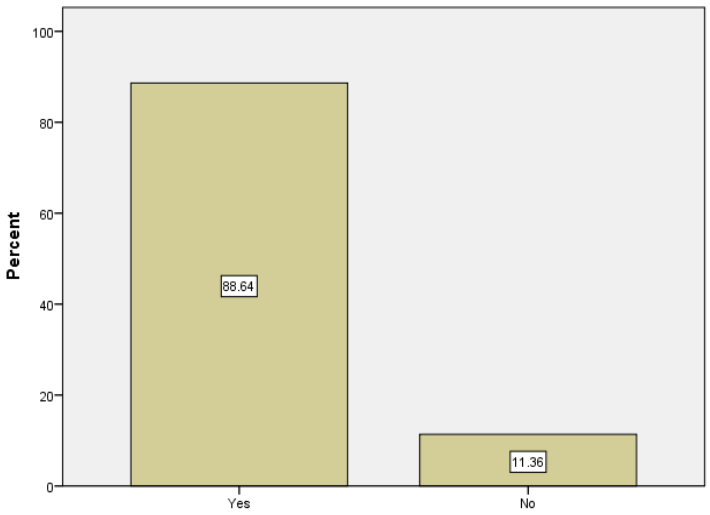


**Figure 8: Percentage ditribution according to the presence of painful breastfeeding in ankyloglossia from January 2018 to January 2019.**

The bar chart above depicts that most of the participants 89% (39\440 presented with painful breastfeeding while only a few 11% (5\44) had presented with no pain during breastfeeding.

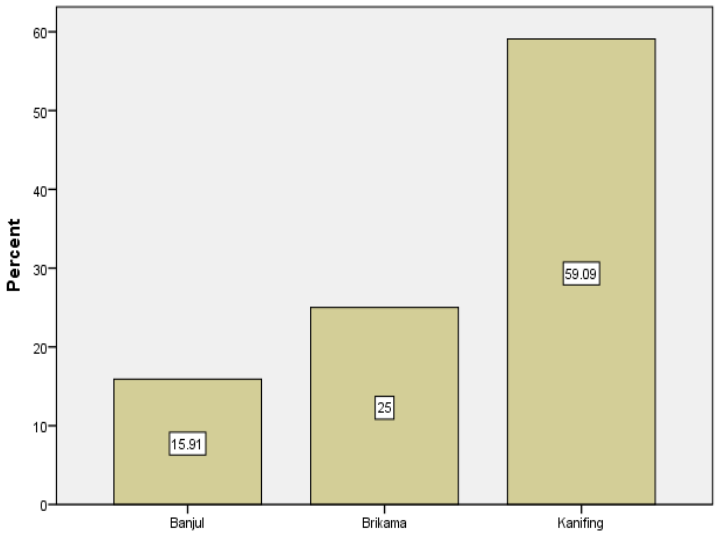


**Figure 10: Percentage distribution according to places attended for antenatal care among Ankyloglossia patients from January 2018 to January 2019 in Edward Francis Small Teaching Hospital.**

The figure above shows that most of them 59% were attending Kanifing municipalities' health centers and hospitals areas for antenatal care, followed by the

Brikama municipalities' health centers and hospitals areas of 25%, then least being Edward Francis Small Teaching Hospital, where 16% attended their antenatal care clinics

Out of the 44 participants that had surgical repair, there was no reported complication after the surgery. The study had also shown that most of these patients having Ankyloglossia were born by young couples of ages ranging from 25 to 35 years for both parents.

## DISCUSSION

Ankyloglossia is a common congenital anomaly that can restrict tongue mobility thereby causing limitations such as feeding and speech difficulties among children.

The result of our study should be interpreted within the context of certain limitations. Our study was retrospective, which can result in incomplete data.

The Prevalence of Ankyloglossia in our study was 10.1 which is similar to study done in Astralia ( )

There were more males affected as compared to female which is similar to the finding in a study done in( Brazil)(51).

The most affected age group were the neonates and the infants which also was found in another study(58). The other groups were also affected but of smaller percentage, the reasons may be due to either its being non-life threatening or lack of proper referral to the oral & maxillofacial surgeon.

The most affected tribe were the Mandinkas and the least affected were the Julas. This could be the fact that the Mandinkas are the majority ethnic group in the Gambia and the Jolas are the far less than the other ethnic groups combined in the Gambia.

The study shows that there is association between family histories, birth defect with ankyloglossia. Other studies have found similar results as above.

Most of the respondents were residing in Kanifing and Brikama municipalities, this could be as a result of these areas, being the most populated areas in the country. Out of the 44 participants, 89% reported of having painful breastfeeding which is similar to the findings by Williams WN, Waldron CM**).**

Breastfeeding is directly related to the sucking and swallowing functions, which are coordinated with breathing. The participation of the tongue movements is fundamental, since it functions to produce the anterior seal, adhered around the nipple, and the posterior seal, adhered to the soft palate and pharynx.3Therefore, any restriction to the free movement of the tongue can result in function impair-ment, thus making breastfeeding difficult.3,4 (Araujo et al )

The authors concluded in their research that frenotomy is a safe and fast procedure, with low morbidity, and it improves the results of breastfeeding(Araujo et al)

There are two kinds of surgical approaches, frenotomy and frenectomy2.

The first procedure releases the frenulum, while the frenectomy removes the frenum entirely. As far as the anesthesia is concerned, some recommend general and others local.

It has dominated that local anaesthesia is preferable for adults and older children and general for young children2. (Chrisis et al ref1,2).

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All of the 44 participants had frenotomy done with successful outcomes in terms of breastfeeding and improved ability to speak were indicated (54).

Some studies also reported that the frenotomy improved the tongue movement in patients with ankyloglossia (49)(53) (55)(56).

However, other studies concluded that surgery has not improved articulation and speech among older children(57)(53). Which confirms the need for speech therapy in the older patients were speech is already fully established.

The study also shows that most of those children with Ankyloglossia are been born by young couples of ages between 25-35 years of age inclusively. In our search, we did not come across any research that had a discussion on parental age groups in association AG.

## CONCLUSION

The study has provided insights on the range of ages of most of these patients with Ankyloglossia and these children were born to young couples of ages ranging from 25 to 35 years.

Most of the participants with Ankyloglossia were between the ages of 0-12 months with male predominant. A very high percentage of the participants had an association with difficulty in breastfeeding and speech difficulty.

The need for education about Ankyloglossia during the antenatal care period in order to create awareness and for early detection, prevention and treatment is advocated.

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