Oral and Facial Inclusion Cysts in Newborns

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This study assessed the frequency of milia, alveolar and palatal cysts prevalence in newborns, as well as the time for complete involution of the most common reported inclusion cyst. Milia, alveolar and palatal cysts were observed in respectively, 31.4%, 28.2% and 78.8% of the newborns. Those that presented milia were 1.2 times more likely to present alveolar cysts. Mean time for complete involution of palatal cysts was 4.5 weeks.
Key words: *newborn, inclusion cyst, oral inclusion cyst, milia*
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INTRODUCTION

There are some transient benign cutaneous and oral mucosal conditions that are frequently observed in newborns. The most common one is the benign micro-keratocyst or inclusion cyst. Cutaneous cysts are known as "milia", while oral mucosal cysts had been classified by Fromm (1967)[1] as Epstein's pearl, Bohn's nodule and dental laminal cysts according to its histological origin and location in the mouth.

Milia are small, epidermal inclusion cysts caused by the retention of keratin at the extremity of hair follicles. They occur almost exclusively on the face, although sometimes they may be seen on the genital areas. Milia may be numerous, desquamate spontaneously, and do not require any intervention.[2] Reports on their prevalence have demonstrated to be close to 35% of newborns.[3,4]

Since mucous glands are usually found in lip mucosa, cheeks, palate and tongue,[5,6] it is clinically difficult to differentiate the oral inclusion cysts origin. For this reason, recent studies have adopted a classification based on their locations. Those located at the mid palatal Raphe are referred as "palatal cysts" while those located on the buccal, lingual, or crest of the alveolar ridge as "alveolar (or gingival) cysts".[7-12] Both oral cysts, alveolar and palatal, appear as small, isolated or multiple, whitish papules.[13] The reported prevalence of alveolar cysts in newborns ranges from 25%[8] to 53%,[7] while for palatal ones is about 65%.[14] Oral inclusion cysts are transient and the decrease in their numbers with time is thought to be due to the cyst wall fusing with the oral epithelium and subsequent discharge of the cystic content.[15,16]

Milia, alveolar and palatal cysts have similar characteristics, such as clinical appearance, content and transient nature. However, the literature lacks information on the subject, including a possible association among these inclusion cysts. The purpose of this study was to evaluate the prevalence and possible association between milia, alveolar and palatal cysts in Brazilian newborns. An additional purpose was to report the most common inclusion cyst observed and its time for complete involution.

MATERIALS AND METHODS

This was a transverse population-based study that intended to examine all newborns in their first three days of life born in six consecutive months at the Hospital Doutor Feitosa in Telemaco Borba city (population 62,859).

The project was approved by an Ethics Research Committee. Authorization was obtained from Hospital Doutor Feitosa Administration to conduct the study in the newborn nursery and examine newborns. Informed consent was obtained from newborn parents/legal guardians prior to the child's enrollment in the study and their clinical examination. After the clinical examination, information about the parents role in promoting their baby's oral health was given to all those who agreed to participate in the study.

Inclusion criteria for the study were: (1) full-term newborns; (2) parents/legal guardians required to be 18-years-old or above; and (3) parents/legal guardians sufficiently literate (able to read and sign). One trained examiner performed all examinations throughout the study. Both oral and facial examination procedures were performed under natural light and direct vision. Criteria for diagnosing milia, palatal and alveolar cysts were as follow: (1) milia – tiny, isolate or multiple, whitish macula or papule-like appearance lesions, with a well defined border, due to retention of keratin at the extremity of hair follicles located in the face; (2) oral cysts - small, isolated or multiple, whitish macula- or papule-like appearance lesions, with a well-defined border; those located on site of fusion of the palatal shelves were referred to as palatal cysts, while those located in the crest of the alveolar ridge and/or buccal or lingual/palatally portion of the alveolar ridge were referred as alveolar cysts. Data on mothers' age, type of delivery (natural birth vs. c-section), and child's

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TABLE 1: Prevalence of skin and oral mucosal cysts in 561 newborn children.

Study variables	Children n	Children %
Skin cysts		
Milia	176	31.4
Oral cysts		
Total	481	85.7
Palatal	442	78.8
Alveolar	158	28.2
Maxillary ridge	135	24.1
Mandibular ridge	53	9.4
Both ridges	20	3.6
Palatal and alveolar	119	21.2

birth weight and height were also recorded via questionnaire specifically designed for this study.

Two months after the beginning of the clinical examinations, it was verified that the most frequent kind of cyst among the examined children was the palatal one. To determine the time for complete involution of the palatal cysts a convenience sample composed was selected which 19 children to be followed up. Inclusion criterion for this group was the mothers' agreement on bringing their babies on a weekly basis to be examined. Clinical examinations in this group were performed in a dental office where the baby was examined under artificial light. The same criteria used in the first examination to classify palatal cysts were employed in these follow-up appointments.

Statistical analysis (Chi-square) used an Epi Info 3.2.2 program. Significance level of 0.05 and 95% confidence interval were settled.

RESULTS

The 567 full term children were born in the investigation period, among them six were excluded because they did not complete the inclusion criteria of the study. Informed consent was obtained from all 561 full term newborns' parents to perform clinical examination at baseline. Two hundred and ninety (51.7%) were female and 271 (48.3%) were male. Mean birth weight was 3307g (SD = 468.9) and average height was 49.2 cm (SD = 1.7). Four hundred and nineteen (74.7%) of the deliveries were by natural births and 142 (25.3%) were by c-sections. Mothers' mean age was 23.6 (SD = 5.5).

Milia were observed in 176 (31.4%) newborns, while oral inclusion cysts in 481 (85.7%) of them. When oral inclusion cysts were classified according to their locations, alveolar and palatal cysts were observed in 158 (28.2%) and 442 (78.8%) of the newborns, respectively (Table 1). One hundred and nineteen (21.2%) of the examined newborns presented with both palatal and alveolar cysts, while 323 (57.6%) presented with palatal cysts only, and 39 (7.0%) with solely cysts.

The prevalence of alveolar cysts in the maxillary ridge (24.1%) was significantly higher than in the mandibular (9.4%) (P = 0.023). Twenty newborns (3.6%) presented alveolar cysts in both maxillary and mandibular ridges (Table 1).

No association was observed between the prevalence of milia and palatal cysts (P = 0.970). However, a significant association was observed between the prevalence of milia and alveolar cysts (P = 0.027). Although palatal cysts were more frequently observed, a relationship between palatal and alveolar cysts was not observed (P = 0.252). It is important to point out that among newborns that presented with alveolar cysts, 75.3% also presented with palatal cysts.

Mean time, from baseline examination, for complete involution of palatal cysts was 4.5 weeks (SD = 2.3) (Fig 1).

DISCUSSION

Although milia and oral inclusion cysts display different histological origins, these cysts have similar characteristics such as clinical appearance, content and transient nature. No previous reports have investigated a possible association regarding their prevalence. A positive association between milia and alveolar cysts prevalence was observed, indicating that newborns that present milia are 1.2 times more likely to present alveolar cysts (P = 0.027). Explanation for this fact can be encountered in the embryologic origin of skin and oral mucosa. Both milia and alveolar cysts originate from ectoderm.

Milia is one of the most common dermatological findings in neonates[17] and arise in sebaceous glands that are not fully developed.[18] Hidano *et al.* (1986)[19] visiting a neonatal ward observed that 15.2% of the examined Japanese children presented with milia. Nanda *et al.* (1989)[3] described that 34.9% of Indian newborns presented milia. Rivers *et al.* (1990)[4] performing cutaneous and oral mucosal examination in a group of 420 Australian neonates, in their first week of life, found that 56% of them presented with Epstein's pearls and 36% with milia. This study found milia present in 31.4% of the newborns, which is close to results reported by Nanda *et al.* (1989)[3] and Rivers *et al.* (1990).[4]

The palatal cysts prevalence encountered is in accordance to pre-

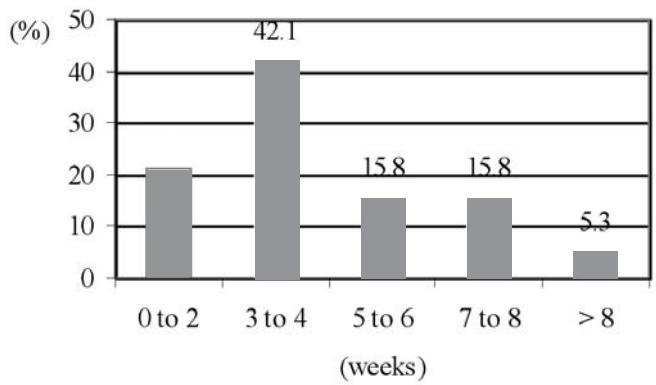

FIGURE 1: Time for complete involution of palatal cysts (n = 19).

viously reported results.[1,7-9,14] Alveolar cysts prevalence (28.2%) is similar to the ones reported by Friend *et al.* (1990),[8] Flinck *et al.* (1994),[9] Correa *et al.* (1997)[10] and Dinis *et al.* (2002).[21] However, Jorgenson *et al.* (1982)[7] reported that among white and black neonates, respectively, 53% and 40% presented alveolar cysts. One possible explanation for this difference may be related to the examination protocols. Although both studies examined newborns while they were still in the hospital, this study performed the clinical examinations using natural light and direct vision; clinical examinations in Jorgeson's *et al.* (1982)[7] study were performed using flashlight, tongue blades and gauze as mechanical aids.

Alveolar cysts were observed in maxillary and mandibular ridges in, respectively, 24.1% and 9.4% cases. The prevalence in maxillary ridge is in agreement with prior reports,[9,10,14] with the exception of studies by Wan *et al.* (2001)[20] and Donley & Nelson (2002)[11] that reported, respectively, that 52% and 58% of full term newborns presented with alveolar cysts in the maxillary region. Alveolar cysts prevalence in the mandibular ridge was almost the same observed in previous reports.[11,14]

Several studies have stated about the transient nature of oral inclusion cysts.[1,7,9,11,16,22] Flinck *et al.* (1994)9 assessed the time for complete involution of palatal cysts and demonstrated that the vast majority of these cysts found at birth disappeared after 2-3 or 4-5 months. This study found that the time, from baseline examination, for complete involution of palatal cysts was about 4.5 weeks (SD = 2.3), with a minimum and maximum, of 2 and 9 weeks, respectively. At four weeks of life, the palatal cysts had already disappeared in 63.2% of the examined children. It is possible that suction and deglutition may play an important role in the involution observed in palatal cysts, since every time the newborn swallows the tongue puts pressure against both the hard and soft palate.

Although inclusion cysts are transient lesions, it is important that professionals involved in newborn care are able to promptly identify these cysts in order to avoid unnecessary therapeutic procedures and provide suitable information for the newborn parents about the nature of these lesions.

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