

PREVALENCE OF NURSING BOTTLE SYNDROME AMONG PRESCHOOL CHILDREN IN JEDDAH, SAUDI ARABIA

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هذه الدراسة أجريت لتحديد مدى انتشار ظاهرة نخر الأسنان نتيجة للرضاعة الصناعية في أطفال مرحلة ما قبل سن الدراسة في جدة.
ولقد تم فحص عينة مكونة من ٢٦٦ طفلاً و ٢٣٦ طفلة بمجموع ٥٠٢، وأظهرت النتائج أن نسبة انتشار هذه الظاهرة في ٢٠٪ في هذا التعداد ولم يكن هناك فرق واضح بين الجنسين في مدى انتشار هذه الظاهرة أو شدتها. وقد استنتج من هذه الدراسة الأهمية القصوى للتحديد المبكر للأطفال القابلين للإصابة بالمرض والاحتياج لاستخدام طرق المناعة المختلفة لهم.
وكانت الظاهرة السريرية الرئيسية لهذه الإصابة تتضمن نموذج النخر الذي أولاً يشمل السطوح اللسانية والشفوية للقواطع الأمامية العلوية المؤقتة والذي بالنتيجة يتقدم باتجاه السطوح الطاحنة للإحساء الأولى المؤقتة العلوية. القواطع السفلية عادة تكون آخر الأسنان التي تصاب وسبب الإصابة هو الاستعمال المديد للسوائل المحلاة أثناء الارضاع بالزجاجة أو استعمال اللهاية (المصاص). كذلك ذكرت حالات شبيهة في الارضاع الطبيعي الغير منتظم.

This study was carried out to determine the prevalence of Nursing Bottle Syndrome in pre-school children, aged 3-6 years, in Jeddah. A total of 633 children, 346 males and 287 females, were examined between January and March 1995. Results showed that prevalence of the syndrome in this population was 20%. There was no significant difference between sexes with respect to the prevalence and the severity of the disease. The need for early recognition of children who are at-risk of this disease and prevention is stressed.

Introduction

Nursing Bottle Syndrome (NBS) has been described as a distinct entity of dental caries.¹ The major clinical feature of the syndrome includes caries pattern which first involves the labial and lingual surfaces of the primary maxillary incisor, and may eventually progress to the occlusal surfaces of

the first primary molars. The lower incisors are usually the last teeth to be affected. The syndrome has been attributed to prolonged use of sweetened liquid, either during bottle feeding or using a pacifier.² Similar condition has also been reported in uncontrolled breast feeding practices.³

Many of the studies on the prevalence of dental caries in Saudi Arabia have been carried out in children of school age and adults. These studies showed that dental caries is prevalent among certain age-group in the population.⁴⁸ However to the author's knowledge, no study has been undertaken to determine the prevalence and severity of NBS in the Saudi population.

The main objective of this study was to provide baseline information on the prevalence of Nursing Bottle Syndrome in comparison with the available data in the literature for other population groups.

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Table 1. Distribution of children according to sex and the prevalence and severity of Nursing Bottle Syndrome.

NBS	NBS Score	Male	Female	Total
Negative	0	266(76.88)	236(82.23)	502(79.30)
	1	4(1.15)	3(1.04)	7(1.11)
	2	23 (6.65)	13(4.53)	36 (5.69)
	3	53(15.32)	35(12.20)	88(13.90)
Positive 1+2 + 3		80(23.88)	51 (17.77)	131(20.70)
Total		346(54.66)	287(45.34)	633(100)

Materials and Method

A total of 633 children, 3-6 year-olds, who are attending four nursery schools in Jeddah were included in this study. The sample consisted of 287 males and 346 females. All children of each age-group in the schools were examined. Examination was made in a classroom setting with a mirror and a probe (Ash # 6) under natural lighting condition. Each child was examined for the presence or absence of NBS and was categorized according to the method used by Babeerly *et al* in 1989. Briefly, the categories were as follows:

Score 0 (negative) - dentition is caries free or no labial and/or palatal caries in the maxillary incisor.

Score 1 (mild NBS) - caries is on labial and/or palatal surface of one or more maxillary incisors only.

Score 2 (moderate NBS) - caries is on labial and/or palatal surface of one or more maxillary incisors and buccal palatal or occlusal surface of either or both maxillary and mandibular first molars.

Score 3 (severe NBS) - same score as 2 except that one or more of these teeth have 3 or more surfaces with contiguous decays or complete coronal destruction.

Prior to the study, training of the examiners on these criteria was undertaken. Inter-examiner reproducibility and reliability (NA and AL) was undertaken during the study by examining a cohort of 40 children at one-week interval.

Results

Analysis of the intra-examiner and inter-examiner reliability assessments gave a Cohen's

kappa statistics of 0.875 and 0.825 values. NBS was observed in about 20% of the children. There was no statistical difference ($P > 0.05$) between sexes as shown in Table 1. Further analysis on the severity of the disease for those children already afflicted with the syndrome showed that about 67% (88 out of 131) had a score of 3. Again there was no sexual difference in this pattern ($P > 0.05$).

Discussion

This is the first study to report on the prevalence and degree of severity of Nursing Bottle Syndrome on children residing in Jeddah. It showed that one in every five children examined had this syndrome which is higher than what had been reported from other communities.^{10,12} In the United States in 1984, Johnsen *et al*⁹ reported a prevalence of 11 % among preschool children in a fluoridated community. In 1993 O'Sullivan and Tinanoff¹¹ reported a value of 16% among 3-4 year-olds head start children in Connecticut, USA. Babeerly *et al* reported a value of 11.5% among 5,473 kindergarten children in Kuwait. However, in 1987 estimates of as high as 75% have been reported by Kelly and Bruerd¹² among two native American population.

Many epidemiological reports in Saudi Arabia have shown an increase in the prevalence of dental caries, especially among children. If this trend continues, then the prevalence of rampant dental decay may also increase. In this study, 67% of the children affected with the syndrome had the severest form. At this stage, most of these teeth require extensive treatment such as total clearance or multiple pulp therapies and complex coronal restorations. Additionally, the age of the patient may present management difficulties which may

require treatment under general anaesthesia or sedation technique.

Previous studies have shown a close association between the syndrome and some factors, such as indiscriminate use of carbohydrate during infancy,^{1,2,9,13} and early colonization of the child's mouth through transmission of *Streptococcus* mutans from the mother to the child.¹⁰ However in 1993, O'Sullivan and Tinanoff¹¹ reported that 70% of the children who had taken a bottle to bed did not develop nursing caries. They concluded that inappropriate use of the bottle and mutans infection may be necessary but not sufficient factors for the initiation of the syndrome. Other suggestive factors include heredity, oral hygiene and dietary practices. A recent study in Guatemala showed a high correlation between malnutrition and development of the disease,¹⁴ while the primary clinical effects of nursing caries include readily identifiable features such as pain, infection and aesthetic problems. It is becoming evident that the disease may affect the general growth pattern of the child¹⁵ since many of these children tend to feed poorly. The disease, therefore, constitutes a health hazard to the children.

Whatever the etiological or risk factors associated with NBS, however, reduction in its prevalence can only be achieved by effective preventive measures. Such measure should include education of mothers, especially during prenatal and immediate postnatal periods. The obstetrician and pediatrician should also be involved in educating the mothers since they are the first line of contact with both mothers and children during this important period of life. Mothers should also be advised to take their children for a dental visit within the first year of life when more information about the relationship of these risk factors and the syndrome could be further explained.

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