A Complimentary Index to Classical Caries Indices

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Abstract

Objectives: To validate the PUFA/pufa index and to assess the prevalence and severity of oral conditions related to untreated dental caries.

Methods: Pufa index records the presence of pulpal exposure (P/p), ulceration caused by sharp edges of dislodged tooth fragments (U/u), fistula (F/f) and abscess (A/a) formation in grossly decayed teeth.

Results: Good Kappa values shows reliability of the index. The prevalence of PUFA/pufa was 0.01% and 86.8% for 6-year old and 50% and 32.9% for 12-year old respectively. In 6 and 12-year old, 74.9% and 74.5% of decayed teeth had progressed to odontogenic infections.

Conclusions: PUFA/pufa index provides a true picture to the prevailing and often ignored oral condition.

Key Words: Untreated dental caries – PUFA/pufa – DMFT/deft index – Consequences – Policy makers.

Introduction

DESPITE improvements in oral health status, Dental caries is still a major global public health problem [1]. The World Health Organization provides an overview of global caries epidemiology that confirms its international Pandemic distribution. Globally, World Health Organization reports prevalence in school children at a level of 60-90% [2].

The effects of untreated dental caries in children range from-pain, swelling, abscess, sinus formation, disturbance of sleep to difficulty in eating. These clinical effects ultimately have an impact on growth and development of children and in some severe cases are the cause of hospitalization too [3-6].

For more than 50 years, data on caries has been collected worldwide using DMFT/deft index. This classical irreversible index just provides us with information on decayed, filled and missing teeth due to dental caries but fails to provide information on the clinical consequences/sequelae’s of untreated dental caries which otherwise have an effect on the lives and daily activities of children [7].

The sequelae’s of untreated dental caries-Pulp exposure, ulceration, abscess formation is not mentioned at all in the scoring system of caries in the latest edition of Oral Health Survey-Basic Methods WHO [8]. Even ICDAS II (international caries detection and assessment system) does not deliver any information on the consequences of untreated dental caries. We ,the dental professionals have an ethical obligation and should provide the correct relevant information to the policy makers about the actual prevailing dental condition in the population. Keeping in view, Monse et al., in 2010, established a scoring system that assesses the prevalence and severity of oral conditions related to untreated caries using PUFA/pufa index [9].

Hence the present study was conducted with an objective to validate the PUFA index and secondly to use this new index in assessing the prevalence and severity of oral conditions related to untreated dental caries.

Material and Methods

PUFA is an index that is used to assess the sequelae’s of untreated dental caries. This index is calculated in the same cumulative manner as DMFT/deft index but recorded separately. The assessment is made visually without the use of instruments. In case of any doubt, the basic score (P/p) for pulp involvement was given. Teeth without pulpal involvement were not recorded. The codes and criteria for PUFA/pufa index are as follows (the upper case letters are used for permanent dentition and lower case letters are used for primary dentition).
P/p: Pulpal exposure is recorded visually, without probing. Most coronal structure is destroyed by caries and only root portion or fragments are left.

U/u: Ulceration of soft tissues by sharp edges of associated decayed carious exposed tooth.

F/f: Fistula is recorded when pus releasing sinus is present in relation to exposed tooth.

A/a: Abscess is recorded when pus containing swelling is present in relation to exposed tooth.

Study population: The public school of Aligarh city (India) was randomly selected. Data were collected during the period from October 2015 till January 2016. Participants in this study comprised 199 school children who were selected by simple random sampling technique (121 6-year old and 78 12-year old). A written consent was obtained from the school authorities. The data were recorded by a single examiner, who was trained and calibrated with DMFT/deft and PUFA/pufa index. Oral examinations were performed in the open air with children lying in supine position. DMFT/deft index was recorded in accordance with World Health Organization criteria for epidemiological studies using a sterilized mouth mirror and a Community Periodontal Index (CPI) probe [8].

Results

Data analysis was done by employing SPSS (Statistical Package for Social Sciences) version 16 software. The validity of the index was assessed by Kappa statistic. Mean, standard deviation and “Untreated Caries PUFA ratio” was analyzed at 95% confidence interval with 5% precision error.

Untreated Caries PUFA ratio = PUFA + pufa X 100
                                   D + d

The inter-examiner reproducibility varies between Kappa values of 0.695-0.664 for scoring DMFT/deft and 0.695-0.664 for PUFA/pufa index for both age groups as shown in (Table 1).

Table (3) shows that in 12-year old, the prevalence of DMFT was 64.6% and deft was 37.2% respectively. Caries experience was 0.91 deft and 1.10 DMFT, with a “D” component of = 0.94, “M” component = 0.14 and “F” component = 0.01 respectively. The prevalence of PUFA index was 50% and pufa was 32.9%. The mean PUFA index of the permanent dentition was 1 and of the remaining primary dentition was 0.86. The “untreated caries PUFA ratio” was 74.5%, indicating that 74.5% of (D + d) decayed component had progressed to odontogenic infection.

Table (2) shows that in 6-year old, the prevalence of deft was 96.7% and DMFT was 0.8%. Caries’ experience in the primary dentition was 2.98 deft, with 2.87 on the “d” component, 0.09 on “e” and 0.02 on “f” component respectively. The permanent dentition presented 0.07 DMFT, purely concentrating on “D” component. The prevalence of pufa index was 86.8% and PUFA was 0.01% respectively. The pufa index for primary dentition was 2.19 and for permanent dentition, PUFA was 0.1. The “untreated caries PUFA ratio” was 74.9%, indicating that 74.9% of (D + d) decayed component had progressed to odontogenic infection.

Discussion

In the recent years, more advanced sensitive diagnostic criteria have been developed to assess the initial stages of carious lesion [10,11]. However, in a developing country like India, where infectious and nutritional diseases are of public health concern, there is a need for an index that assesses the sequelae of untreated carious lesion.

The way data are presented, they are interpreted by the policy makers in the same manner. For example, the DMFT for 12-year old in our study was 1.10.
This can lead to loss of important data and complacency among policy makers. As looking at the score of DMFT, we have already achieved the WHO/FDI global oral health goal based on DMFT of <3 in 12-year old by the year 2015. On the other hand, the reality is just the opposite. In the same age group 74.5% of (D + d) decayed component had progressed to odontogenic infections. This clearly demonstrates the limited and often misleading explanatory power of DMFT/deft index [9].

The components of PUFA/pufa index provides a “TRUE PICTURE” to the existing and often ignored oral condition and should be used together with DMFT/deft or ICDAS II, as PUFA complements them. Though a new index, the Kappa values with DMFT/deft or ICDAS II, as PUFA complements them. It has potential to be incorporated into health policies and political agendas. By exposing them. It has potential to be incorporated into health policies and political agendas. By exposing

Conclusions:

PUFA/pufa index should be presented together with DMFT/deft or ICDAS II, as PUFA complements them. It has potential to be incorporated into planning, formation and implementation of oral health policies and political agendas. By exposing policy makers only to DMFT data, leaves them unaware of the high levels of untreated carious lesions.

References


الملخص العربي

هدف الدراسة: مساحة مقياس PUFA/pufa وقياس معدل وشدة الاصابة بحالات الأسنان في الأطفال المصابين بتسوس الأسنان.

البحث: يجري مقياس PUFA/pufa من وجود تعرض لأسنان (P/Pه P/U من الحواف الحادة لأجزاء من الأسنان (A/A)... أو تكون خراج في أسنان متصلة بشكل كبير (F/F).

النتائج: إن قيمة كثافة المقدار ثابت كبير للمقياس، وكان معدل انتشارPUFA/pufa هو 6.01% في الأطفال في عام 6 سنوات، بينما كان 6.01% 2.77% بين الأطفال في عام 12 سنة. وقد تفاقم حالة الأسنان المتصلة إلى إنتاج سنين انتفاش في 4.9% 4.8% من الأطفال على التوالي.

الاستنتاجات: يعكس مقياس PUFA/pufa صورة حقيقية لحالة الأسنان التي أحيانا ما تكون مهمة.