THE INDEX OF ORTHODONTIC TREATMENT NEED - A REVIEW

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ABSTRACT

Malocclusion is one of the commonest dental problems. Correction of malocclusion requires evaluation before planning Orthodontic treatment. Evaluating various types of malocclusion is an important aspect for planning Orthodontic treatment. An epidemiologist uses orthodontic indices as a tool to analyse the prevalence and severity of various types of malocclusion. There are several methods of grading and assessing malocclusion. The index of orthodontic treatment need (IOTN) is one among them. The aim of this review article is to brief about IOTN orthodontic index, its method of application and the various advantages and limitations of using this index.

INTRODUCTION

Malocclusion is the second most common oral health problem. People having malocclusion are in need for orthodontic treatment. People having malocclusion are in need for orthodontic treatment. Presence of malocclusion leads to various oral health problems by affecting the functional needs and also compromising on dentofacial esthetics, speech, mandibular function and psychological well being of individual. Before an orthodontist plans orthodontic treatment for an individual with malocclusion, one has to evaluate the degree of severity of malocclusion to accurately plan the orthodontic treatment. Hence, many orthodontic indices were developed so as to categorize the malocclusion into various groups according to severity of malocclusion.

Of these, the most popular indices have been Summers’ Occlusal index, the Treatment Priority Index (TPI), the Handicapping Malocclusion Assessment Record, the Need for Orthodontic Index and the Index of Orthodontic Treatment Need (IOTN). Among all these indices, the Index of Orthodontic Treatment Need index has been a reliable epidemiological tool, which benefits local health services in planning their budget, and improve focus of services by inducing greater uniformity and standardization in the assessment of Orthodontic treatment need. The IOTN has been gaining international recognition as a method of objectively assessing treatment need. Hence, the present review articles attempt to discuss the IOTN index and the various advantages of using this index to determine the Orthodontic treatment need for an individual with malocclusion.

The Index Of Orthodontic Treatment Need

The Index of Orthodontic Treatment Need was developed in UK by Brook & Shaw in 1989. It was introduced as Index of Orthodontic Treatment Priority and later renamed as ‘IOTN’. It is a clinical index which prioritizes and classifies malocclusion according to treatment needs ultimately to compare populations. IOTN index is a modification of the index used by the Swedish Dental Health Board which was used to record the need for Orthodontic treatment on dental health and functional grounds. The IOTN index is one of the commonly used quantitative types of Occlusal indices that assess the Orthodontic treatment need among children and adults. The IOTN has two separate components; a clinical component called the Dental Health Component (DHC) and an Aesthetic Component (AC). DHC and AC are two separate components and are not combined together. Both DHC & AC are recorded separately.

Dental Health Component (DHC)

The DHC of IOTN is an adaptation of an index used by the Swedish Medical Health Board (SMBI). The original form of this Swedish Index was developed having four categories of need (grade 1 to 4). Later on, Linder-Aronson & Co-workers in 1976 revised the index and added a fifth
category, the grade zero, and describing subject with no need for treatment (Table 1).

Table 1 The Modified 5-grade index 9ISMHB) for orthodontic treatment need (Swedish Medical Health Board, 1996; Linder-Aronson, 1974, 1976)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No need</td>
</tr>
<tr>
<td>1</td>
<td>Little need, gingival contact, open bite with frontal opening, crossbite without a forced bite, mild crowding or spacing, mild rotations of only little aesthetic and/or functional significance.</td>
</tr>
<tr>
<td>2</td>
<td>Moderate need, contact point displacements greater than 1 mm but less than or equal to 2 mm.</td>
</tr>
<tr>
<td>3</td>
<td>Urgent need, contact point displacements greater than 2 mm but less than or equal to 4 mm.</td>
</tr>
<tr>
<td>4</td>
<td>Very urgent need, contact point displacements greater than 4 mm.</td>
</tr>
</tbody>
</table>

The DHC represents biological or anatomical aspect of IOTN that record need for treatment on dental health and functional grounds. The DHC may be applied both clinically ant to study casts. When applied to study casts there are minor differences in the definition of some traits. To record the DHC, a specially designed ruler is used (figure 1).

Figure 1 IOTN DHC Ruler

As explained in table 2 and 3, the DHC has five grades ranging from grade one, ‘no need’, to grade five, ‘very great need’. A grade is allocated to the severity of the worst occlusal trait and describe the priority of treatment. In recording the worst trait following hierarchical scale is used in a descending order.

Hierarchical scale

1. Missing teeth (including aplasia, displaced & impacted teeth)
2. Overjets (including reverse sagittal overjets)
3. Crossbites
4. Displacements
5. Overbites
6. Pneumonic acronym: MOCDO

The hierarchical scale has two components

1. The dentition is assessed systematically, thus ensuring that all relevant occlusion anomalies are recorded.
2. If two or more occlusal anomalies are of the same DHC grade, the most severe one is scored.
The Aesthetic Component

For this component the SCAN index (standardized Continuum of Aesthetic Need) was utilized\textsuperscript{17}. This scale was constructed using dental photographs of 1000 12 year olds collected during a large multidisciplinary survey. The Aesthetic component measures aesthetic impairment and justifies treatment on social – psychological grounds\textsuperscript{18}. It consists of a 10-point scale illustrated by a series of photographs that were rated for attractiveness by a panel of lay judges and were selected as being equidistantly spaced through the range of grades.

A rating is allocated for overall dental attractiveness rather than specific similarities to the photographs. The final value reflects the treatment need on the grounds of aesthetic impairment and by implication of the social psychological need for orthodontic treatment (figure 2).

The Modified Iotn\textsuperscript{19} -

The modified IOTN is a two – grade scale,

Grade 1.- No Need
Grade 2.- Definite Need,

Instead of five grade scale with 30 sub categories, the modified IOTN is based on idea that the IOTN is not an index to measure the complexity; and therefore, there is no benefit in recording the occlusal anomaly that placed the child in treatment need category. The modified IOTN simplifies identifying people in need of treatment and improves the reliability and validity of the index. By using the modified IOTN, every case with IOTN DHC $\geq$ 4 and / or IOTN AC $\geq$ 8 is classified as being in need of treatment. Since its introduction, few epidemiological studies used the modified IOTN; the index has been simplified to two categories: Definite Need for Treatment and No Definite Need for Treatment.

Advantages of Iotn Index-

1. IOTN is a clinical index to assess Orthodontic treatment need.
2. The index can be used either directly on the patient or on the plaster models.
3. The validity and reliability of the IOTN have been verified\textsuperscript{20, 21, and 22}.
4. IOTN is one of the most commonly used occlusal indices to assess the Orthodontic treatment need among children and adults.
5. The index defines specific, distinct categories of treatment need, with including a measure of function. The use of IOTN index allows improved focusing of services and has the potential to induce greater uniformity throughout the profession and standardization in the assessment of Orthodontic treatment need. IOTN has gained international recognition as a method of objectively assessing treatment need. The IOTN data gives support for early Orthodontic treatment need. IOTN is objective, synthetic and allows for comparison between different population groups. IOTN is proved to be an easy-to-use and reliable method to describe the need for Orthodontic treatment need. The DHC of IOTN helps in determining manpower requirements for planning Orthodontic treatment need. The Aesthetic component of IOTN reflects the social and psychological need for Orthodontic treatment need.

Limitations Of Iotn Index

1. Sometimes there might be a discrepancy between the Dental Health Component and Aesthetic Component grades of IOTN index.
2. The Aesthetic Component of IOTN assesses the aesthetic aspects of malocclusion only in the frontal view and highlights the subjective nature of it.
3. Because of the above two limitations of using IOTN, any clinician who is interested in using the IOTN index should receive proper training and undergo the calibration process.

CONCLUSION

The Index of Orthodontic Treatment Need has proved to be a reliable, reproducible Orthodontic Treatment Need Index due to its simplicity and objective nature of application. The IOTN assesses the need for Orthodontic treatment according to the highest potential risk to the integrity of the teeth or supporting structures from the malocclusion. The IOTN index has been used as a helpful sieve in allocating treatment services where resources are limited in a fair and transparent way. The use of IOTN index is hence recommended in order to prioritize the treatment need of malocclusion. The use of this index in epidemiological surveys and in clinical settings should be encouraged.

References

19. Richmond, S; Shaw, WC; Stephens, cd; Webb, WG; Roberts, CT; Andrews, M. (1993). Orthodontics in the


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