SELF-PERCEPTION OF MALOCCLUSION SEVERITY: IOTN-AC

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Abstract

The purpose of orthodontic treatment is to get a functional occlusion and a good aesthetic result. More and more patients require orthodontic treatment and the main motivation is the improvement of smile aesthetics. Over the years, numerous indices have been developed to rank or score the severity of a malocclusion relative to a preconceived orthodontic ideal, or in terms of treatment need. One of these is the IOTN index that in evaluating the severity of malocclusion includes occlusal alterations with aesthetic perception of the patient. The IOTN-AC (Aesthetic Component) includes a set of 10 intraoral frontal photographs to be rated from 1 to 10, with 1 being the most attractive to 10 being the least attractive. Â Â In order to reach a leaning result it is important to understand if the perception that the patient has of himself is related to the real need for treatment and this should coincide with the one of the clinician.Â

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Introduction

Malocclusion is not considered a disease but a deviation from normality, so entering orthodontic treatment in pupplic healthcare is complicated. It appears that only severe malocclusion has a deleterious effect on dental health and wellness, however, studies reveal that malocclusions have a significant impact on the psychosocial health of the affected individual[1,2].

Over the last ten years there has been a significant increase in the demand for orthodontic treatment by patients, the main reason that drives patients to require a treatment is the improvement of smile aesthetics[3,4,5].

It is now known that a very important aspect related to aesthetics is the psychological one. The attractiveness of smile plays a fundamental role in social interaction, it influences the success, personality development, performance, employment prospects and social interaction[6,7].

It has been shown that the benefits of orthodontic treatment on oral health from the point of view of the function improvemnent are considerably lower than the benefit that the patient acquires on the psychological level[8,9].

Orthodontists believe that in the future the psycho-social component of malocclusion will be one of the most important reasons for orthodontic treatment, infact the repercussion that malocclusion has on psycho-physical wellness has been widely demonstrated.

Any prediction about the need for orthodontic treatment as prevention of problems related to the psychological component of the patient canâ€™t be made without an index able to relate the severity of malocclusion and psychic wellness.

For this reason, the indexes of need for orthodontic treatment should also consider the aesthetic component. Several orthodontic indexes have been developed over the yearsÂ Â to provide information on the prevalence of malocclusions and objectively quantify the severity of the various features of malocclusion; Â however, each method has its limitations[10].

Measuring the aesthetic handicap that a particular malocclusion can cause and how much this affects the social relations of the patient is not a simple task.

It is difficult to define the severity of malocclusion because perception is extremely subjective, moreover, while orthodontists follow orthodontic parameters based on the achievement of an ideal occlusion, patients prefer the standards of beauty imposed by society and the cultural context[11,12,13].

One of the most used indexes is the IOTN index, the Index of Orthodontic Treatment NeedÂ was introduced by Brook and Shaw[14] to form a valid and reproducible index of orthodontic treatment priority. The index consists of two components, the Aesthetic Component and the Dental Health Component.

The IOTN-DHC (Dental Health Component)Â evaluates the occlusal alterations and the severity of the malocclusion by condensing missing or unerupted teeth, overjet, crossbites, displaced contact points, overbite, ecc. It consists of 5 grades of treatment need, ranging from 1 (no need for treatment) to 5 (very great treatment)[15].(Picture 1).

The IOTN-AC (Aesthetic Component) includes a set of 10 intraoral frontal photographs to be rated from 1 to 10, with 1 being the most attractive to 10 being the least attractive. The IOTN-AC provides a measurable, visual assessment regarding the patient perception of their presenting malocclusion and their treatment needs. Grades 1-4 of the AC represent no need for orthodontic treatment, grades 5-7 represent borderline need, and grades 8-10, definite need for treatment[16] .(Picture 2).Â Â

The patient must identify himself in one of these 10 photographs, then the patient's level is compared to the one chosen by the orthodontist who, being more trained, is more objective in estimating the severity of malocclusion.

The success of orthodontic treatment provides that the patient and the orthodontist agree on the severity of the malocclusion, this complicity helps the patient to understand better the treatment plan, it facilitates dialogue with the doctor and improves compliance.

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Materials and Methods

The objectives of this review are to assess the aesthetic perception of the patient in relation to the degree of severity of the malocclusion using the IOTN index, to see if there is a correlation between the perception of the clinician and the patient one, and which occlusal factors affect the aesthetic perception of the patient using the IOTN- AC.

The systematic review of literature has been performed on the principal medical databases: PubMed (Medline),Scopus. The keywords used were: *IOTN index, orthodontic treatment, severity of malocclusion, perception of the patient, orthodontics index.* Following the search, 43 articles were selected.

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Discussion

It is important to correlate the level of IOTN-AC with the occlusal severity index obtained with the IOTN-DHC to see if the patient has a correct perception of the severity of its malocclusion or if it is overstimated or underestimated.

A study[17] shows that an orthodontist categorized 62.8% of patients as having soft/mild treatment need,

whereas 79.3% of the patients also perceived themselves as having mild/soft treatment need. This is in contrast with the IOTN-DHC that identifies only 30.6% of patients as having mild treatment need. So, we can conclude that the patient and orthodontist tend to perceive patient malocclusions as more aesthetically pleasing than the normative treatment need would indicate.

Birkeland et al.[18] found that in a sample size of 359 children with a mean age of 10.6 years, 53.2% had moderate to severe treatment need, as the normative need, while self-perception was inclined towards mild treatment need.

There are also other studies that have found different results about patient's need considering IONT DHC index and IONT AC[19,20].

This difference between the occlusal component and the aesthetic component of the ITON could be explained by the fact thatÂ the overjet increase Â is one of the most important occlusal parameters contributing to increase the severity of malocclusion, and this is not easily identifiable in the frontal photos of the IOTN-AC.

The more the patient correctly perceives his aesthetic problem and the severity of the malocclusion, the more his compliance, the motivation and therefore the result of the therapy are better[21,22].

Most authors[23,24], have observed a tendency for clinicians to be more critical than the general public. With the IOTN-AC, the orthodontists scored the malocclusions more severely than the general practice dentists or the general population.

A study conducted by Abdullah and Rock[25] on 5112 Malaysian children aimed to assess their treatment need using IOTN-AC scores determined by orthodontists, children, and their parents. The study did not take into account the normative treatment need. They found that while the orthodontist scored 22.8% of children in Definite Treatment Need (IOTN-AC 8â€"10), 5.8% of children and 4.8% of the parents had the same result. So children and their parents perceived the children's treatment needs differently than did the orthodontists.

Several studies tried to evaluate which occlusal parameters influence the aesthetic appearance of the patient:Â Abdullah and Rock[25] using IOTN-AC, found that children perceive anattractive dental crowding, deep bite and tooth size;

Borzabadi-Farahani[29] in a study conducted on 502 Iranian school children between the ages of 11â€"14 years, found that the most common occlusal feature

was severe maxillary crowding (43.6%), followed by increased overbite (39.1%);

Another study[17], conducted in a clinical setting, has shown that dental crowding (26.4%) and deep bite (5.8%) are among the more frequently presenting occlusal features leading to increased severity of malocclusion.

The important aspect of IOTN-AC efficacy is the correlation and the agreement between the perception of the patient and the orthodontist; orthodontists are not always aware of the different patient's perception.

When the patient does not agree with the clinician's opinion, dialogue can help to overcome this discrepancy, to improve the comprehension of the current condition, and to improve the mutual trust between the doctor and the patient.

Some studies have indicated that patients overestimate their pretreatment conditions than clinicians[27,28], on the other hand another study showed that an orthodontist may overestimate the severity of conditions to a greater extent (11.5%) than patients (6.7%).

Dogan et al.[29] found that there is a significant correlation between the DHC and the orthodontist-rated AC of IOTN, this means that he orthodontist's ability to perceive the patient's malocclusion is much more accurate and comprehensive than the one in the view of the orthodontist's clinical skills.

Studies showing lower correlation between patients and clinicians opinions are those in which the study group is made up of preschoolers[30,31].

A greater correlation has been obtained by considering older patients (adolescents), they have a greater awareness of their physical appearance and their aesthetic needs. Adolescence is the time what concern about appearance and facial attractiveness is developing, which translates to an increased awareness of body image[32].

Many authors have concluded that it is better to analyze the self-perceived psychosocial impact of dental aesthetics in adults, as they already possess a certain emotional stability and have a more realistic view of dentofacial aesthetics[33,34,35,36]. Patient tend to give themselves lower IOTN AC scores when compared with the examiner[18,37,38].

The purpose of IOTN is to integrate occlusal and aesthetic alterations of malocclusion by evaluating the patient's perception and its effect on its life quality[39,40], however, its reliability has been questioned by several

authors[19,37,41].

Patients sometimes hesitate between two very different photographs, showing the difficulty they have in identifying themselves in one of the ten photographs[42].

Moreover, the IOTN-AC shows ten frontal photographs and many aspects that do not appear in the IOTN-AC are overlooked, such as anterior crossbite, increased overjet, even though it is very important talking about aesthetics[43].

Conclusion

- With IOTN-AC patients give themselves lower rates of malocclusion severity than those recorded, relying on occlusal alterations, with IOTN-DHC.

- Occlusal alterations that most affect the aesthetic perception of the patient are the increase in overbite and dental crowding,

- Although overjet is one of the factors that most influences on the objective component of malocclusion, it has little influence in determining the aesthetic component score as it is unmatched in frontal photos.

- Patient tended to give themselves lower IOTN AC scores when compared with the orthodontists.

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