AESTHETIC PERCEPTION OF DENTAL FLUOROSIS - OPINIONS OF DENTISTS AND NON-SPECIALISTS

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ABSTRACT
Aesthetic perception of the changes in teeth appearance is one of the factors that makes a person undertake a dental treatment.

OBJECTIVE: The aim of this study was to survey dentists’ and non-specialists’ aesthetic perception of dental fluorosis.

PATIENTS AND METHODS: We recruited 120 young people (age range 18 - 22 years with little knowledge of dental fluorosis and 120 randomly selected dentists. Evaluation of the abnormalities in the teeth aesthetic appearance was conducted using cards specially designed for the purpose.

RESULTS: The results suggest that changes in dental fluorosis, even in the mildest forms, are perceived as deviations in the aesthetic appearance of teeth. Non-specialists are more tolerant towards the changes characteristic of mild dental fluorosis compared with their reaction to other conditions that result in deviations in the type of dentition as a whole.

CONCLUSION: Further studies are needed to more precisely determine the role of aesthetic perception in determining the indications for the complex treatment of dental fluorosis.

Key words: dental fluorosis, aesthetic perception

INTRODUCTION
Aesthetic problems associated with dental fluorosis have had different priorities in different periods of time. The first studies were conducted in parallel with Dean’s epidemiological studies at the time of the Great Depression in the U.S. when aesthetic issues were deemed unimportant. It was only later that dental fluorosis related problems were assigned higher priority in some countries. In none of these countries has dental fluorosis been considered a public health problem, but there is a common belief in people that the attractive people have greater chances for development. The look of the teeth affects a lot how people evaluate themselves and the oral area is vital for the attractiveness of the face.

Simultaneously with the development of aesthetic dentistry, patients’ requirements to the esthetic appearance of their teeth increase. Studies have been carried out on the perception of dental fluorosis as an independent estimate and also in comparison with other conditions in the oral cavity. Differences have been found in the views of parents, children and dentists of mild dental fluorosis. Dentists can identify the slightest abnormalities in the appearance of the teeth, probably because they know well what the healthy enamel looks like. Experts argue that mild fluorosis has small cosmetic effects, but for the affected individual it may be an aesthetic problem.

The opinions of first-year students in dental medicine are similar to the ones of non-professionals. These students, interviewed again after their fourth year, show much more tolerance towards cosmetic deviations in fluorosis. This change in perception is due to the accumulated knowledge of various pathological conditions in the oral cavity, leading to a more tolerant attitude towards conditions that are not associated with complications.

Studies conducted to date demonstrate a relative tolerance towards the mildest forms, maybe due
to the greater knowledge of dental fluorosis. This data has been obtained from studies conducted in societies where lighter forms of fluorosis have been common for many years and have accompanied the reduction of dental caries.

Epidemiological studies have shown that due to the free access to various sources of fluoride that exist in the country, dental fluorosis occurs in places that are not fluorendemic. An upward trend of its dissemination has been established. At the same time, there is a lack of data in relation to the aesthetic perception of dental fluorosis in different groups in society which has predetermined the purpose of this study: to investigate the aesthetic perception of dental fluorosis by dentists and by non-specialists.

MATERIAL AND METHODS

The aesthetic perception of dental fluorosis by non-specialists was examined with the participation of 120 youths aged 18 to 22 years who had no knowledge of dental fluorosis. Evaluation of deviations in the aesthetic appearance of the frontal teeth was performed using a specially made card. It includes photographs with different deviations in the aesthetic appearance of the teeth (the photographs are the author’s clinical cases). The severity of dental fluorosis was estimated using the Tylstrup Fejerskov index (TFI). As a benchmark to assess the deviations in aesthetics, a map of orthognathic dentition with normal shape and colour of teeth was included. Dental fluorosis was compared with other conditions where there were deviations in the aesthetic appearance of the teeth. The evaluation was carried out on a ten-point scale. The survey data was recorded in statistical form. The median assessment values given by participants for each of the images were calculated (Fig. 1).

The aesthetic perception of dental fluorosis by experts was examined with the participation of 120 randomly selected dentists from Plovdiv. Evaluation of deviations in the aesthetic appearance of the frontal teeth was performed using a specially made card. It includes photographs of the upper central incisors with dental fluorosis of varying degrees of severity according to the Tylstrup Fejerskov scale (by 618). Photographs with severity of dental fluorosis between TFI = 1 and TFI = 7 were included. No photograph with higher levels of severity were included since their need for treatment was evident (Fig. 2). The need for treatment was examined according to the assessment of the respondents. The latter were supposed to indicate in which of the photographs they considered it necessary for a treatment to be undertaken to improve aesthetics. The survey data was recorded in statistical form. A calculation was performed of the relative share of dentists who would undertake treatment to improve the aesthetics in each of the included pictures.

RESULTS

The evaluation of deviations in the aesthetic appearance of the frontal teeth of the photographs included in the map for non-specialists shows that young people perceive abnormalities in the aesthetics of the teeth as more serious compared with those caused by dental fluorosis (Fig. 3). Top-rated on the ten-point scale is photograph 1. Microdontia with...
**Figure 2.** Cards for assessing the need for treatment of dental fluorosis

**Picture 1** - TFI = 1. Includes weakest signs of dental fluorosis. There are thin opaque white lines on the tooth surface, which corresponds to the location of perykimata.

**Picture 2** - TFI = 2. White lines are more pronounced, in some areas they merge, forming small opaque areas.

**Picture 3** - TFI = 3. The opaque areas are more expressed; white lines corresponding to perykimata are visible between them.

**Picture 4** - TFI = 3. The clinical picture is the same as in Picture № 3, but there is coloration in the mesio-incisal areas.

**Picture 5** - the whole surface of the tooth is opaque and appears chalk white. In tooth 11 TFI = 4. In tooth 21 TFI = 5. The surface of the tooth is chalk white, rounded grooves are observed with a diameter less than 2 mm.

**Picture 6** - = 7 TFI. There is uneven loss of enamel, which affects less than ½ of the tooth surface. The remaining enamel is opaque.

**Figure 3.** Assessment of deviations in the aesthetic appearance of teeth in dental fluorosis from non-specialists.
Diastema and midline deviation is seen as the most serious abnormality in the aesthetics of the teeth, which reflects their overall appearance. Picture 2 receives a significantly lower assessment. This is understandable because the teeth are generally well-ordered and have normal colour. The change in shape is localized and does not affect so heavily the appearance of the teeth compared with picture 1. The estimates of pictures 3 and 4 also confirm that young people perceive dentition as a whole and weaker changes in the colour of the teeth are not evaluated as significant deviations in aesthetics. Picture 3 receives a higher estimate of aesthetics deviation in comparison with picture 4, although the severity of dental fluorosis in picture 4 is greater.

Table 1. Assessment of deviations in the aesthetic appearance depending on the gender and reliability of differences

<table>
<thead>
<tr>
<th>Gender</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>8.78 ± 1.88</td>
<td>7.46 ± 1.73</td>
<td>6.14 ± 2.52</td>
<td>5.29 ± 1.85</td>
<td>5.91 ± 1.91</td>
<td>4.72 ± 2.23</td>
</tr>
<tr>
<td>Women</td>
<td>9.25 ± 1.61</td>
<td>8.24 ± 1.61</td>
<td>6.02 ± 2.58</td>
<td>4.98 ± 1.95</td>
<td>6.60 ± 1.92</td>
<td>5.35 ± 1.85</td>
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<tr>
<td>u</td>
<td>0.2</td>
<td>0.33</td>
<td>0.03</td>
<td>0.14</td>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td>P</td>
<td>&gt; 0.05</td>
<td>&gt; 0.05</td>
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This can be explained by the fact that in picture 3 the upper lateral incisors have not yet erupted through, which impacts negatively the aesthetics of the dentition as a whole. The chalk-white colour of the teeth in pictures 4 and 6 gives a lower estimate of the aesthetics deviation in comparison with picture 5, showing a yellowish-brown colour. The yellowish-brown staining of teeth 11 and 21 in picture 5 provokes the sense of aesthetics in young people to a greater extent than the partial loss of enamel, which occurs in teeth 11 and 21 in picture 6.

Despite the differences in assessments obtained for the respective pictures, the main conclusion of the analysis of the data is that all young people surveyed perceive dental fluorosis as a deviation in the aesthetics of the teeth. Comparison of the data according to sex shows no statistically significant differences in median assessment between men and women (Table 1).

The results show that with the increasing severity of dental fluorosis there increase the relative shares of dentists who believe that treatment is necessary to improve the aesthetic appearance of affected teeth. One part of them would undertake treatment even in mild manifestations of dental fluorosis presented in pictures 1 (29.17%), picture 2 (38.33%) and picture 3 (75.83%). The views of these dentists correspond with the views of young people presented above, who evaluate the same levels of dental fluorosis as a deviation in the aesthetics of the teeth. What is worth a note is the big difference in the relative shares of dentists who believe that treatment is necessary for the case presented in pictures 3 and 4, despite identical severity of dental fluorosis (u = 5.51, P < 0.01). The difference is obviously determined by a yellowish-brown coloration of the mesio-incisal areas, which further deteriorates the aesthetic appearance of the teeth.

The study of aesthetic perception of dental fluorosis conducted by us is the first of its kind in our country. The results clearly show that changes in teeth affected by dental fluorosis, including the lowest levels of severity, are perceived as a deviation in the aesthetic appearance of the teeth. Non-specialists are more tolerant to changes characteristic of low levels of dental fluorosis compared to other conditions in which changes in the shape of the teeth are severe and lead to deviations in the nature of the dentition as a whole. Chalk-white staining of teeth in dental fluorosis is perceived as a lesser deviation in aesthetics, compared with the yellowish-brown colour and that fact is valid both for the assessment of non-specialists and for the dentists in view of the need for treatment. Many of
the dentists who participated in the study believed that treatment to improve the aesthetics of the teeth should be undertaken in cases with lesser degrees of severity as well.

CONCLUSIONS

Changes in dental fluorosis are seen as abnormal aesthetic appearance of the teeth both by non-specialists and by dentists. In solving the problems related to aesthetics a comprehensive approach is required. Aesthetic perception of dental fluorosis is a factor that determines the need for treatment in any particular individual. Undertaking treatment only based on the patient’s aesthetic perception may, in some cases, be premature. There is a need to conduct more studies related to the psychological problems that dental fluorosis can involve, the factors determining them and the possibilities for creating a tolerant attitude to minor forms, which will lead to improving the assessment of the need for treatment at an individual level.

REFERENCE

ЭСТЕТИЧЕСКОЕ ВОСПРИЯТИЕ ЗУБНОГО ФЛЮОРОЗА – МНЕНИЕ ВРАЧЕЙ ПО ДЕНТАЛЬНОЙ МЕДИЦИНЕ И НЕСПЕЦИАЛИСТОВ

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РЕЗЮМЕ

Эстетическое восприятие изменений во внешнем виде зубов представляет один из факторов, определяющих необходимость в лечении на индивидуальном уровне.

Цель: Исследовать эстетическое восприятие зубного флюороза врачами по дентальной медицине и неспециалистами.

Материал и методы: Объектом наблюдения являются 120 молодых людей в возрасте от 18 до 22 лет, не имеющих познаний о зубном флюорозе, и 120 врачей по дентальной медицине, включенных по методу случайного подбора. Оценка отклонений в эстетическом виде зубов делятся с помощью специально выработанных для этой цели карточек.

Результаты: Результаты исследования показывают, что изменения при зубном флюорозе, включительно и при самых низких степенях тяжести, воспринимаются как отклонение в эстетическом виде зубов. Неспециалисты более толерантны к изменениям, характерным для низких степеней зубного флюороза по сравнению с другими состояниями, приводящими к отклонениям в виде прикуса в целом.

Заключение: Исследования следует продолжать с целью прецизировать роль эстетического восприятия при определении индикаций в комплексном лечении зубного флюороза.