Relevance. According to World Health Organization caries is the most abundant condition included in the 2015 Global Burden of Disease Study, ranking 12th for deciduous teeth (560 million children) and first for decay of permanent teeth (2.3 billion people). Caries is the outcome of the complex interaction of pathological and protective factors and the balance between them changes during the day. The dominance of pathological factors results in carious lesion.

Purpose of the study. The aim of this research was to study and compare effects of treating caries in enamel between ICON system and restoration.

Materials and methods of research. Twenty two patients age 12 to 40 with caries in enamel were examined and treated (picture 1). Twelve were treated with ICON and ten with restoration. The following materials were used ICON (Icon-Etch, Icon-Dry, Icon-Infiltrant) and restorative materials, etching gel, bond/adhesive (picture 2). First, professional hygiene had been done. Then, for first group following steps had taken place: etching with Icon-Etch, drying and visual check with Icon-Dry, application of Icon-Infiltrant, repeat the application of Infiltrant, light-curing, polishing, checking results; in second group following steps had taken place: choosing the color (A1, A2, B1, etc.), preparation of tooth where caries lesion is, primary resistance form, primary retention form, etching, bonding, filling, polishing, checking results; in second group following steps had taken place: choosing the color (A1, A2, B1, etc.), preparation of tooth where caries lesion is, primary resistance form, primary retention form, etching, bonding, filling, polishing, checking results. After restoration, we could check results by X-ray. Caries in enamel was located on tooth neck, contact areas and others. Photographs were done before and after the treatment, images are superimposed for comparison. Criteria of comparison were the following: aesthetic satisfaction (color and tooth surface), penetration in enamel structure (X-rays and SS-OCT), time taken to provide treatment for one tooth. Statistical analysis is performed on StatPlus software. It should be noted that the high results occurred owing to the fact that the number of patients is limited.

Results of the study. After performing of professional hygiene of oral cavity first group of patients was treated with ICON (resin infiltration treatment) and second group — with traditional filling. ICON gives following information on criteria (table 1): (1): 12 out of 12 patients – 100%; (2): 12 out of 12 patients – 100%; (3): 12 out of 12 patients – 100%; (4): 15-20 minutes. On the other hand restoration shows the following (table 1): (1): 8 out of 10 patients – 80%; (2): 10 out of 10 patients – 100%; (3): 0 out of 12 patients – 0%; (4): 40-60 minutes. Results show that in both cases aesthetic satisfaction had been achieved (histogram 1). X-rays after the restoration show that there is no changed structure of enamel in the border with restoration.
Discussions of the results. When caries in enamel is appeared cariogenic compounds such as acids withdraw the minerals while attacking the enamel (picture 2). The structure of tooth becomes porous. As well-known, caries in early stages causes changes in color shading such as white spots. After treatment with ICON we have those results: pores are closed up, that prevents tooth penetrating by acids (picture 3). Hence, it is possible to stop the progressing of emerging caries. Such findings also confirmed in “Resin Infiltration of Non-Cavitated Caries Lesions: A Systemic Review” where it says “All the included studies showed significant differences in caries progression between test and control/placebo groups, indicating that resin infiltration may inhibit the caries process” and this systemic review revealed that resin infiltration appeared to be an effective method to arrest the progression of non-cavitated caries lesions”[3]. Due to the fact that one of the priorities of the “Densaulyk” State programme for the promotion of health care 2016-2019 is to prevent diseases on early stages we believe that the ICON system is a good example to develop this issue.

Conclusion. These findings indicate that ICON stops progression of caries lesion and gives aesthetic results as well as this new method means that with ICON preserves healthy tooth structure. This research demonstrated that

<table>
<thead>
<tr>
<th>Treatment and number of patients</th>
<th>Aesthetic satisfaction, number of patients</th>
<th>Penetration in enamel structure, number of patients</th>
<th>Time of treatment, minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICON, 12 patients</td>
<td>12</td>
<td>12</td>
<td>15-20</td>
</tr>
<tr>
<td>Restoration, 10 patients</td>
<td>8</td>
<td>10</td>
<td>40-60</td>
</tr>
</tbody>
</table>

Table 1. Results of comparison in treating caries with ICON and restoration

Picture 3. Acid effects on tooth surface before the treatment

Picture 4. Acid effects on tooth surface after the treatment with ICON system

Aesthetic satisfaction histogram

Histogram 1. Aesthetic satisfaction of patients
ICON does not require drilling what supposed to mean — the destruction of healthy tooth tissue is not required too, when compared to the restorative technique. It also demonstrated that ICON provides instant, long-term and persistent effect when in the same cases restoration needs time for preparation and we have to be very careful not damage too much of healthy tissue, needs to be replaced after five years. One meaningful disadvantage of ICON suitable for our region is high-cost of it that is why possible unavailability of using this system for a broad cross-section of the population.

References:
1. WHO. Sugars and dental caries. WHO technical information note. October 2017

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1. WHO. Sugars and dental caries. WHO technical information note. October 2017