

SEM and micro-analysis study of the structure of enamel in the tooth surface from low and high caries risk patients.

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The enamel structure in the tooth surface is likely to have important clinical implications as it can affect the development of dental caries and the bonding of restorative materials (1,2).

This study compares the structural and chemical nature of enamel in the tooth surface from low and high caries risk patients.

Six clinically caries-free premolars extracted from six orthodontic patients, 4 aged 13 – 14 and two 24 years old were used in this study. The teeth were classified according to patient's caries experience in susceptible or not susceptible. The structure of enamel on vestibular surface of teeth crowns was analysed using SEM. Chemical analysis was obtained by EDS method.

The results found in this study show differences in the structure and chemical composition of enamel surface that must be taken into account in research of caries process. Chemical analysis showed differences between high and low caries risk, and young and adult patients (table 1).

The SEM results are shown in Figure 1. The teeth from not susceptible patients (1BR, 2BR and 3BR), presented a normal structure, in young patients perikymata were observed in cervical area, in adult patient the characteristic structure were lost and the surface appears smooth. While the surface in caries susceptible patients (4AR, 5AR and 6AR), presented numerous and irregularly shaped porous. Moreover, in young patients prismatic structure was observed.

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#### References.

1. Gaspersic D. Micromorphometric analysis of cervical enamel structure of human upper third molars. *Arch oral Biol.* 1995; 40: 453 – 457
2. Reyes-Gasga J, Alcantara-Rodriguez CM, Gonzalez-Trejo AM and Madrigal-Colin A. Child, adult and aged human tooth enamel characterized by electron microscopy. *Acta Microscopica* 1997; 6: 24 - 38

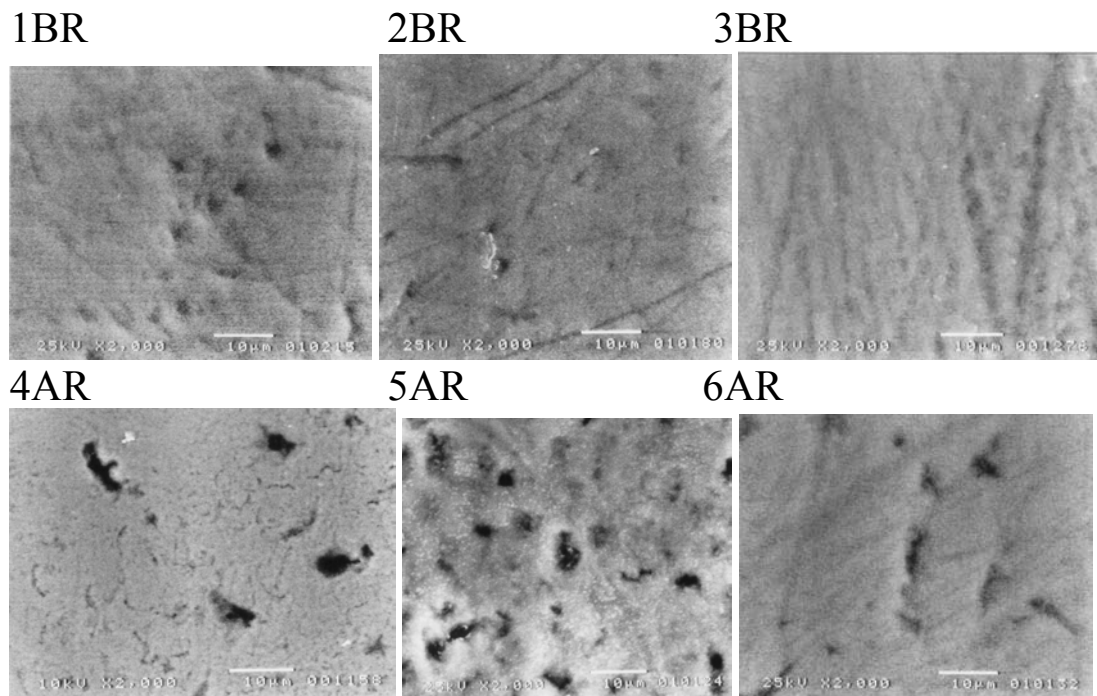


Figure 1. SEM images of vestibular teeth surface from six patients in the study. 1BR, 2BR and 3BR present characteristic surface structure. The high caries risk patients presented an enamel surface with numerous and irregularly shaped porous and prismatic structure, 4AR, 5AR and 6AR

Table 1. Results of EDS analysis of the enamel surface of the six patients in the study.

Sample	C	O	P	Ca	Mg	Na	Mg	Cl
1BR	38.22 (1.31)	32.08 (0.58)	10.97 (0.27)	1800 (0.48)	0.35 (0.06)	0.35 (0.06)	0.08 (0.02)	0.27 (0.03)
2BR	38.56 (1.60)	32.59 (0.09)	10.67 (0.34)	17.36 (0.44)	0.23 (0.07)	0.23 (0.07)	0.16 (0.02)	0.38 (0.05)
3BR	41.90 (1.03)	29.67 (0.63)	10.62 (0.22)	16.95 (0.27)	0.39 (0.10)	0.39 (0.10)	0.09 (0.02)	0.34 (0.03)
4AR	36.92 (4.77)	33.93 (2.39)	10.75 (0.92)	17.52 (1.46)	0.35 (0.03)	0.35 (0.03)	0.08 (0.03)	0.37 (0.04)
5AR	32.19 (1.21)	35.29 (0.55)	11.94 (0.19)	19.72 (0.35)	0.35 (0.04)	0.35 (0.04)	0.08 (0.02)	0.41 (0.04)
6AR	37.91 (1.17)	31.70 (0.52)	11.10 (0.63)	17.86 (0.98)	0.75 (0.10)	0.75 (0.10)	0.15 (0.05)	0.46 (0.10)

