

Study of the correlation between risk factors and prevalence of root caries

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Summary

Root caries and its consequences are of increasing importance, particularly to the geriatric population. The aim of this study was to determine the prevalence of root caries lesions in Belarus and their possible interrelation with several risk indicators and risk factors in older adults. Four hundred subjects of 65-74 years old in six regions of Belarus were surveyed. Oral hygiene (OHI-S, Green-Vermillion, 1964), DMFT, root caries (DT), CPITN (Ainamo J., 1983) and loss of attachment (Stahl, Morris, 1955) were recorded. We established low prevalence and incidence of root caries in 65-74 yr-old adults in Belarus, because they had low number of retained natural teeth. There was close correlation of root caries and risk factors such as poor oral hygiene, severity of periodontal disease and gingival recession in the studied population.

Key words: root caries, elderly people, risk indicators and risk factors.

Introduction

Root caries lesion (caries of cementum, K.02.2, ICD-DA, WHO, 1995) may be defined as lesion resulting from a carious attack on root structure below cemento-enamel junction with no initial involvement of the adjacent enamel or restorations [1, 2]. In recent years there has been an increasing interest in root surface caries. There is evidence that although root surface caries occurs frequently in developed societies, little attention has been paid to this condition until recently, probably due to the major problems encountered with coronal caries. Root surface caries tended to occur at an age when tooth loss was accepted as the norm, which tended to reduce the impact of the condition. With a higher proportion of the population in developed countries living into old age, coupled with a decrease in tooth loss, it is inevitable that root surface caries will draw more attention in future years. Root surface caries is generally confined to exposed root surfaces and is therefore an unusual condition, because its occurrence is dependent on previous disease, resulting in a loss of attachment and exposure of cementum. Later studies reported that over half

of the caries lesions in those aged 50 or older were cemental in origin. According to the worldwide studies, prevalence of root caries in the elderly may be as high as 88%, although average figures are around 40-50% [2-6]. In our previous studies in Belarus we found comparatively low prevalence of root caries. In 35-44 years age group only $11.2 \pm 1.9\%$ S.E. had root caries (average 0.2 ± 0.06 S.E. teeth affected); in 65-74 year-old people root caries was in $18.2 \pm 1.5\%$ S.E (av. 0.4 ± 0.05 S.E. teeth affected) of surveyed subjects [7-10]. Root surfaces become exposed to oral environment as a result of pathologic changes, mechanical injuries, or periodontal surgery. A variety of risk factors and risk indicators were determined for the development of root caries: age, poor oral hygiene and loss of attachment [2, 8, 9]. However, according to *Hahn P., Helliwig E.* (2002) [11] known risk factors such as gender and educational level were of minor importance. In a view of the fact that root caries prevalence vary significantly in different countries it is important for more comprehensive studies of the disease epidemiology and etiology to be carried out.

The aim of the study was to determine the prevalence of root caries lesions and their possible interrelation with several risk indicators and risk factors in older adults.

Material and methods

Four hundred subjects between 65-74 years old (M-112, F-288) in randomly selected factories and institutes for the elderly in six regions of Belarus were surveyed by calibrated dentists. Oral hygiene (OHI-S, *Green-Vermillion, 1964*), DMFT, root caries (DT), CPITN (*Ainamo J., 1983*) and loss of attachment (*Stahl, Morris, 1955*) were recorded in standard condition, using the WHO 1986 oral health assessment form. The surveyed subjects were suggested a questionnaire of their oral health related behaviours: frequency of dental visits and brushing teeth, type of toothpastes used. Statistical analysis was carried out using ANOVA (SE, SD, t and p criteria).

Results and discussion

According to oral health survey data average, 14.8% of the surveyed elderly were edentulous. The percentage of the edentulous varied in different regions from 10.2 to 18.6 (*Figure 1*). Average numbers of retained natural teeth in all regions of Belarus were below WHO recommendation (*Figure 2*) and consisted in 13.8 per subject. All dentate subjects were affected by dental caries. Average DMFT was 22.5 of which decayed teeth were 1.7, missing - 18.2, filled - 2.6. The majority of teeth (81%) in the DMFT index were missing (*Figure 3*). Among dentate people the average prevalence of root caries in total was $17.8 \pm 1.5\%$; the mean number of teeth affected was 0.27. There were some variations of the prevalence in surveyed regions (*Figure 4*). The subjects with root caries lesions had the worst oral hygiene, OHI-S 5.4 ± 1.1 (*Figure 5*) as compared with those who had no root caries

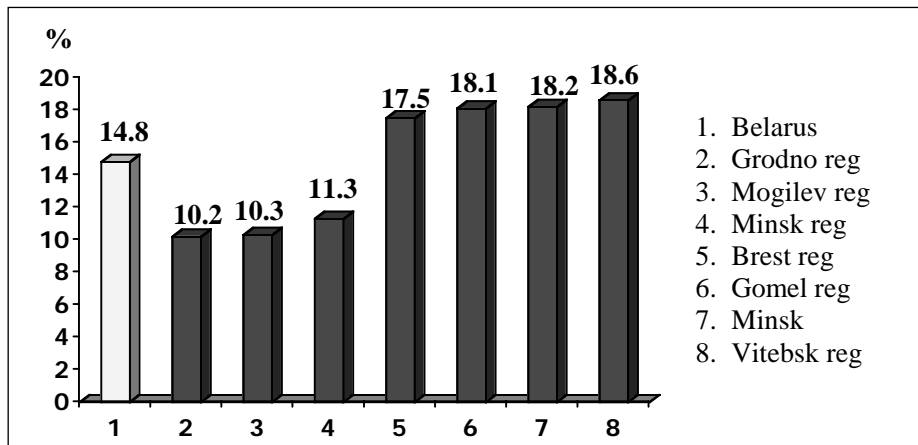
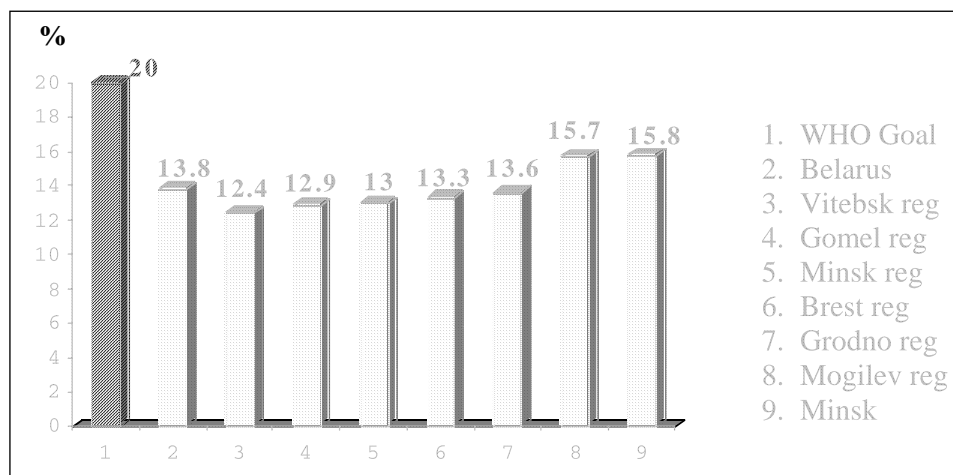


Figure 1. Edentulousness of the population at age 65-74 yrs in different regions of Belarus

Figure 2. Average number of retained natural teeth of the population at age 65-74 yrs in different region of Belarus



lesions (OHI-S 3.87 ± 0.8 ; $p < 0.05$); they brushed their teeth and visited dentists less frequently. Elderly people with root caries in most cases were using nonfluoridated locally made toothpastes (Table 1). Prevalence of root caries in subjects with CPITN score "2" was $16.3 \pm$

3.9% ; with CPITN "3" was $22.3 \pm 3.2\%$; with CPITN "4" - $34.9 \pm 7.3\%$ ($p < 0.05$). Increasing the level of attachment loss from 3 to 11 mm coincided with the increase of root caries prevalence from $13.5 \pm 5.6\%$ to $47.0 \pm 12.1\%$ ($p < 0.05$). Details of findings are illustrated in Table 2.

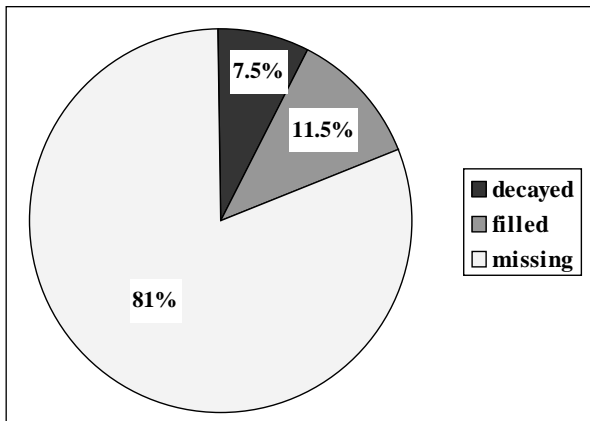


Figure 3. Percentage of decayed, missing and filled components of the DMFT in old adults in Belarus

Figure 4. Prevalence of root caries among 65-74 yr-old people in different regions of Belarus

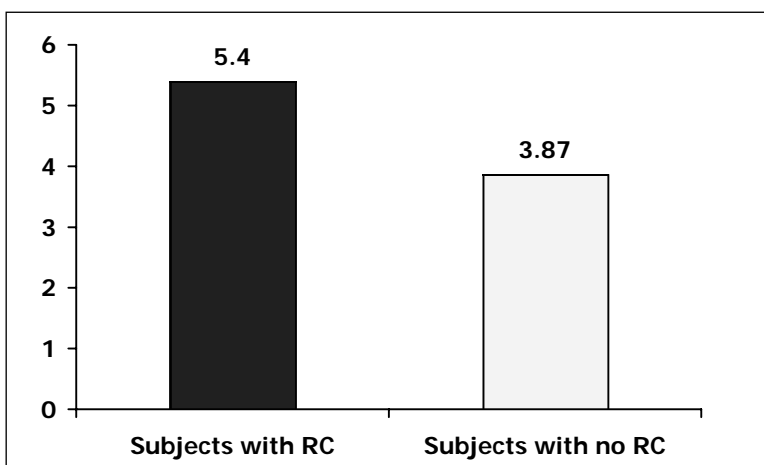
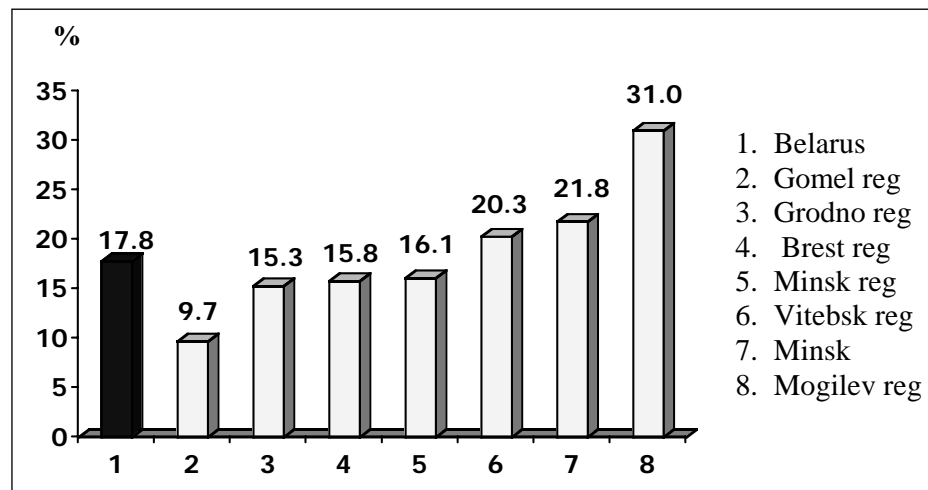


Figure 5. Oral hygiene and prevalence of root caries (RC) in old adults

This study showed the comparatively lower root caries prevalence than in other surveys of the same age group of the population in Europe (Vehkalahti M., 1987; Galan D., Lynch E., 1993; Splieth Ch., 2004). One of the most probable reason was that the number of retained teeth limits the possible number of teeth surfaces with loss of attachment. On the other hand, in our previous studies we did not find root caries lesions in young adults and only few in the 35-44 year-old group (Agiemtseva S. et al., 1995). In this survey the poor oral hygiene was probably the most obvious risk factor for root caries.

Conclusion

Comparatively low prevalence and incidence of root caries in 65-74 yr-old adults in Belarus depend perhaps on the low number of retained natural teeth. There was close correlation of root caries and risk factors such as poor oral hygiene, severity of periodontal disease and gingival recession in the studied population.

Table 1. Prevalence of root caries and number of dental visits, frequency of toothbrushing and type of toothpaste used by adults 65-74 yrs old

Study risk indicator	Root caries prevalence (%)		
	male	female	all
Number of dental visits			
< one a year	35.2	22.5	57.7
one a year	16.9	12.7	29.6
> one a year	9.9	2.8	12.7
Frequency of toothbrushing			
seldom	54.9	38.0	92.9
once per day	1.4	5.6	7.0
twice or more per day	0	0	0
Type of toothpaste			
Locally made, non fluoridated	33.8	49.3	83.1
Imported, non fluoridated	4.2	12.7	16.9

Table 2. Prevalence of root caries and periodontal conditions in 65-74 yr-old people in Belarus

Study risk factors	Root caries (% affected)	Average number of teeth
CPITN		
"2"	16.3 ± 3.9	0.3 ± 0.08
"3"	22.3 ± 3.2	0.4 ± 0.05
"4"	34.9 ± 7.3	0.8 ± 0.1
Loss of attachment		
0-3 mm	13.5 ± 5.6	0.2 ± 0.1
4-5 mm	18.9 ± 3.5	0.4 ± 0.07
6-8 mm	44.6 ± 5.8	0.9 ± 0.09
9-11mm	47.0 ± 12.1	0.6 ± 0.3

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