Oralno zdravlje u antičkih stanovnika Vinkovaca – Cibala u Hrvatskoj (3.–5. Stoljeće)

Peko, Dunja; Vodanović, Marin

Source / Izvornik: **Acta medico-historica Adriatica : AMHA, 2016, 14, 41 - 56**

Journal article, Published version
Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

Permanent link / Trajna poveznica: https://urn.nsk.hr/urn:nbn:hr:127:379168

Rights / Prava: Attribution 4.0 International/Imenovanje 4.0 međunarodna

Download date / Datum preuzimanja: **2024-08-06**

Repository / Repozitorij:

University of Zagreb School of Dental Medicine Repository

Izvorni znanstveni članak Acta Med Hist Adriat 2016; 14(1);41-56

Original scientific paper

DENTAL HEALTH IN ANTIQUE POPULATION OF VINKOVCI – CIBALAE IN CROATIA (3rd- 5th CENTURY)

ORALNO ZDRAVLJE U ANTIČKIH STANOVNIKA VINKOVACA – CIBALA U HRVATSKOJ (3.–5. STOLJEĆE)

Dunja Peko*, Marin Vodanović**

Summary

Roman city Cibalae (Vinkovci) – the birthplace of Roman emperors Valentinian I and Valens was a very well developed urban ares in the late antique what was evidenced by numerous archaeological findings. The aim of this paper is to get insight in dental health of antique population of Cibalae. One hundred individuals with 2041 teeth dated to 3rd – 5th century AD have been analyzed for caries, antemortem tooth loss, periapical diseases and tooth wear. Prevalence of antemortem tooth loss was 4.3% in males, 5.2% in females. Prevalence of caries per tooth was 8.4% in males, 7.0% in females. Compared to other Croatian antique sites, ancient inhabitants of Roman Cibalae had rather good dental health with low caries prevalence and no gender differences. Statistically significant difference was found between males in females in the prevalence of periapical lesions and degree of tooth wear. Periapical lesions were found only in males.

Key words: *antique; caries prevalence; paleodontology; Croatia.*

* Student, School of Dental Medicine, University of Zagreb, Zagreb, Croatia.

** Dental Clinic of the University Hospital Centre Zagreb; Department of Dental Anthropology, School of Dental Medicine, University of Zagreb, Zagreb, Croatia.

Correspondence address: Marin Vodanović, Department of Dental Anthropology, School of Dental Medicine, University of Zagreb, Gundulićeva 5, 10000 Zagreb, Croatia. E-mail: vodanovic@sfzg.hr.

Introduction

Making the dental pathology profile of earlier human populations (including data about dental caries, antemortem tooth loss, periapical abscess, enamel hypoplasia, dental calculus and alveolar resorption) yields valuable clues regarding diet, food preparation, nutrition and subsistence. The distribution of dental diseases by age, sex and status group can aid in the identifying the differential effects of nutritional stress within a population. Diagnosis and interpretation of dental illnesses in paleodemographic contexts are important steps in the attempt to reconstruct past lives.

Vinkovci is a city in Slavonia, in the Vukovar-Srijem County in eastern Croatia. Today`s Vinkovci and surrounding area have been continually inhabited since the Neolithic period. Around 8000 years ago a settlement was established on the banks of the river Bosut. The Romans named the town Colonia Aurelia Cibalae, and it was the birthplace of Roman emperors Valentinian I (364-375) and Valens (364-378). Valens and his brother Valentinian were both born in Cibalae into an Illyrian family in 328 and 321 respectively (1). The town got its municipal status in the time of the emperor Hadrian (117-138), which suggests that the town must have had an urban character. The town of Cibalae was promoted to a colony with the emperor's decree at the beginning of the 3rd century. A phase of stable development lasted until the dynasty of the emperor Constantine (305 – 363), when Cibalae was in the period of its greatest prosperity and urbanization. This period continued throughout the times of the Valentinian dynasty, which is known for its great public works and investments in the town. A lot of the buildings can be dated from the fourth century and a great deal of numismatic findings can be traced from this period. This phase lasted until the year 378 when, after the battle at Hadrianopolis, the system of provincial life in Pannonia broke down. The town underwent general crisis and depopulation and it can be assumed that life went on in smaller town areas during the 4th and the 5th century (2). The total area of the town was about 500,000 square meters. It is assumed that during the peak of Cibalae it was inhabited by up to 10.000 citizens. Studies have revealed the existence of numerous facilities: town bathing, a decumanus, the main sewer, a granary, a number of kilns for ceramic and many other public and private objects (2).

Archaeological site Vinkovci was investigated and described in numerous studies (3). Few of them were focused on bioarchaeological remains (4). Šlaus described the late antique Cibale (Vinkovci) skeletal series (5). He

examined 34 individuals from the 4th century for frequencies of cribra orbitalia, vertebral osteoarthritis, Schmorl`s defects, carious lesions, enamel hypoplasia and alveolar bone diseases. Novak and Šlaus analysed the traumatic bone injuries on 31 skeleton from Late Antique (3r - 5th century AD) population from Vinkovci (6).

In period from 2007 until 2012 a new antique site (3rd – 5th century AD) was found in Vinkovci and 100 skeletons were excavated and stored in City Museum in Vinkovci. The aim of this paper is to get insight in dental health of antique population of Vinkovci (frequency, distribution and characteristics of dental caries, periapical diseases and tooth wear) and compare the obtained results with other Croatian antique sites.

Materials and methods

The research was carried out on the skeletal remains of 100 individuals dated to 3rd – 5th century AD and excavated from 2007 until 2012, from 4 sites in Vinkovci (Kaufland, Makart, Anina street and Gunduliceva street), Figure 1. The samples were stored at the City Museum in Vinkovci.

Figure 1. Map of the excavation site in Vinkovci: 1 - Kaufland, 2 - Makart, 3 and 4 Anina street, 5 – Gundulićeva street.

In this analysis all available skulls were analysed, regardless of the level of damage. The state of preservation varied from completely preserved skulls with complete mandibles, to cases where only small fragments of the maxilla or mandible were preserved (Table 1).

Table 1. Preservation of the skeletal remains.

Level of preservation	Number of individuals
1	42 (42%)
2	16 (16%)
3	31 (31%)
4	11 (11%)
Total	100 (100%)

The following levels of preservation of the maxilla and mandible were noted in the series:

- Level 1 – indicating preservation of both maxilla and mandible and preservation of more than 50% of alveolar bone,
- Level 2 – indicating preservation of both maxilla and mandible but with preservation of less than 50% of alveolar bone,
- Level 3 – indicating preservation of only the maxilla or the mandible and preservation of more than 50% of alveolar bone,
- Level 4 – indicating preservation of only the maxilla or the mandible and preservation of less than 50% of alveolar bone.

Selection of only well preserved remains could result in an inaccurate frequencies of examined features. Jaw bones weakened antemortem by various diseases like periapical pathologies are more likely to suffer postmortem damages (7).

The sex of the examined individuals was determined on the basis of morphological differences in pelvic and cranial region between male and female skeletons (8).

Age at death was determined by dental development in cases with deciduous and mixed dentition, and by cranial suture fusion and tooth wear according to Lovejoy in adults (9). Individuals were grouped in four age groups: 0 - 14 year (subadults), 15- 29 year (young adults), 30 – 44 year (adults), 45+ year (senior adults).

Dental health examination included the registration of number of non-carious teeth, tooth loss, unerupted teeth, number of carious teeth, number of carious lesions on teeth, location of carious lesions on teeth, degree of tooth destruction by caries, number and size of periapical lesions and level of tooth wear. Tooth loss was classified as ante- or postmortem. Teeth were considered lost postmortem if there was clear evidence of alveolar socket. Caries were diagnosed macroscopically under a bright light, with the help of a dental probe. A lesion was considered a caries if there was a clear defect in tooth tissue. Color changes of the enamel were not considered caries unless there was cavitation underneath. Location of carious lesions on teeth was classified as follows:

- Class 1 – Lesions in pits and fissures (occlusal surfaces) of all teeth including foramen caecum of frontal teeth
- Class 2 – Lesions in proximal surfaces of premolars and molars
- Class 3 – Lesions in proximal surfaces of incisors and canines without an incisal angle loss
- Class 4 – Lesions in proximal surfaces of incisors and canines with an incisal angle loss
- Class 5 – Lesions on tooth cervix
- Class 6 – Lesions found on places different than above.

Degree of tooth destruction by caries was classified as follows (10):

- Level 1 – healthy tooth with no cavity
- Level 2 – little pit or a small fissure lesions
- Level 3 – large carious lesions, therewith less than 2/3 of a dental crown has been damaged
- Level 4 – nearly complete teeth crown destruction, only the roots have been preserved
- Level 5 – the tooth has been lost, alveoli is closed or facing closure, any parts of root remaining.

The size of periapical lesions was classified as follows (11):

- Level 1 – the small ones – smaller than 3 mm
- Level 2 – medium sized ones – between 3 and 7 mm
- Level 3 – large ones – over 7 mm.

Tooth wear was classified as follows (12):

- Level 0 – intact tooth without signs of tooth wear
- Level 1 – localized or total loss of enamel on tooth, dentin is intact.

– Level 2 – loss of enamel and exposure of dentin on less than 1/3 of whole tooth
– Level 3 – loss of enamel and exposure of dentin on more than 1/3 of whole tooth, but without exposure of pulp or secondary dentin
– Level 4 – complete loss of enamel and exposure of secondary dentin or pulp.

The statistical significance of the recorded values was tested with the chi-square test.

Results

The analyzed sample consisted of the skeletal remains of 100 individuals. 51% of the sample were males, 27% females and 22% subadults. Age and sex distribution of the sample is shown in Table 2. 90% of the sample had permanent dentition, and in 10 individuals (10%) mixed dentition was found.

Table 2. Age and sex distribution of the sample.

Age (years)	**Number of persons (%)**	
Subadults		
0 - 14	22 (22%)	
Adults	Males	Females
15 - 29	14 (14%)	9 (9%)
30 - 44	27 (27%)	15 (15%)
45+	10 (10%)	3 (3%)
Adults - total	51 (51%)	27 (27%)
Subadults and adults - total	100 (100%)	

2122 tooth sockets have been analyzed and 2041 teeth were found. Prevalence of antemortem tooth loss was 4.3% (46 antemortem lost teeth) in males, 5.2% (33 antemortem lost teeth) in females and 0.5% (2 antemortem lost teeth) in subadults as shown in Table 3. Prevalence of caries per tooth was 8.4% (85 carious teeth) in males, 7.0% (42 carious teeth) in females and 3.1% (11 carious teeth) in subadults.

Prevalence of caries per individual is shown in Table 4. Caries prevalence in the whole sample was 53.0% (58.8% males, 70.4% females and 18.2% subadults). Although females had higher prevalence of caries per individual the difference is not statistically significant.

Table 3. Distribution of tooth sockets and teeth in the sample.

Gender	Age (years)	Number of examined tooth sockets	Number of antemortem lost teeth (%)	Number of postmortem lost teeth	Number of examined teeth	Number of teeth with at least one carious lesion (%)
subadults	0-14	428	2 (0.5)	73	353	11 (3.1)
female	15-29	221	0 (0.0)	60	161	12 (7.4)
female	30-44	352	21 (6.0)	75	256	24 (9.4)
female	45+	59	12 (20.3)	21	26	6 (23.1)
female total		632	33 (5.2)	156	599	42 (7.0)
male	15-29	368	1 (0.27)	39	287	17 (5.9)
male	30-44	511	29 (5.7)	91	391	51 (13.0)
male	45+	183	16 (8.7)	80	128	17 (13.3)
male total		1062	46 (4.3)	210	1016	85 (8.4)
female and male total		1694	79 (4.7)	366	1615	127 (7.9)
subadults, female and male total		2122	81 (3.8)	439	2041	138 (6.8)

Table 4. Prevalence of caries per individual

Gender	Age (years)	Number of individuals without caries (%)	Number of individuals with caries (%)	Total (%)
subadults	0-14	18 (81.8)	4 (18.2)	22 (100.0)
female	15-29	3 (33.3)	6 (66.7)	9 (100.0)
female	30-44	5 (33.3)	10 (66.7)	15 (100.0)
female	45+	0 (0.0)	3 (100.0)	3 (100.0)
female total		8 (29.6%)	19 (70.4)	27 (100.0)
male	15-29	11 (78.6)	3 (21.4)	14 (100.0)
male	30-44	9 (33.3)	18 (66.7)	27 (100.0)
male	45+	1 (10.0)	9 (90.0)	10 (100.0)
male total		21 (41.2)	30 (58.8)	51 (100.0)
female and male total		29 (37.2)	49 (62.8)	78 (100.0)
subadults, female and male total		47 (47.0)	53 (53.0)	100 (100.0)

A total of 125 carious lesions were diagnosed. Majority of teeth had only one carious lesion (88.8%), two separated carious lesions were found on 13 teeth (10.4%), three separated carious lesions were found on only 1 tooth (0.8%), Table 5.

Table 5. Number of carious lesions

		Number of teeth			
Gender	**Age (years)**	**1 lesion**	**2 lesions**	**3 lesions**	**total**
subadults	0-14	9	2	0	11
female	15-29	11	1	0	12
female	30-44	22	2	0	24
female	45+	5	1	0	6
female total		38	4	0	42
male	15-29	4	0	0	4
male	30-44	45	5	1	51
male	45+	15	2	0	17
male total		64	7	1	72
female and male total		102	11	1	114
subadults, female and male total		111	13	1	125

The highest number of carious lesions was located on proximal surfaces of premolars and molars (37.6%) and in pits and fissures (36.8%). Males had higher prevalence of carious lesions on proximal (45.8%) and occlusal tooth surfaces (41.2%) than females (28.6% and 26.2%). Females had more carious lesions on tooth cervix (26.2%) compared to males (2.8%) as shown in Table 6.

Table 6. Location of carious lesions

		Location of carious lesions* Number of teeth						
Gender	Age (years)	1	2	3	4	5	6	Total
subadults	0-14	5	2	0	0	0	4	11
female	15-29	4	5	0	0	1	2	12
female	30-44	6	6	1	0	6	5	24
female	45+	1	1	0	0	4	0	6
female total		11	12	1	0	11	7	42

		Location of carious lesions* Number of teeth						
Gender	Age (years)	1	2	3	4	5	6	Total
male	15-29	1	8	0	0	0	2	11
male	30-44	22	24	1	0	1	3	50
male	45+	7	1	0	0	1	1	10
male total		30	33	1	0	2	6	72
female and male total		41	45	2	0	13	13	114
subadults, female and male total		46	47	2	0	13	17	125

* for code description please see Materials and methods section

The highest number of teeth showed level 2 of tooth destruction (56.5%) with a small cavity or a small fissure caries, while 34.7% of teeth showed level 3 of tooth destruction with extensive carious lesions. As shown in Table 7, only 8.1% of examined teeth head nearly complete crown destruction.

Table 7. Degree of tooth destruction by caries

		Degree of tooth destruction Number of teeth					
Gender	Age (years)	1	2	3	4	5	Total
subadults	0-14	0	6	0	0	0	6
female	15-29	0	11	7	2	0	20
female	30-44	0	18	8	0	0	26
female	45+	0	23	13	3	0	39
female total		0	58	28	5	0	91
male	15-29	0	20	12	2	0	34
male	30-44	0	26	21	5	0	52
male	45+	0	30	25	8	2	65
male total		0	76	58	15	2	151
female and male total		0	134	86	20	2	242
subadults, female and male total		0	140	86	20	2	248

* for code description please see Materials and methods section

Periapical lesions were found only in males. Total of 21 lesion was registered and most of them (57.1%) were medium sized, Table 8. The difference between males and females in the number of periapical lesions was statistically significant ($X2=12.6$, $p<0.01$).

Table 8. Number and size of periapical lesions

		Size of periapical lesions Number of lesions (%)			
Gender	Age (years)	1	2	3	Total
subadults	0-14	0 (0%)	0 (0%)	0 (0%)	0 (0%)
female	15-29	0 (0%)	0 (0%)	0 (0%)	0 (0%)
female	30-44	0 (0%)	0 (0%)	0 (0%)	0 (0%)
female	45+	0 (0%)	0 (0%)	0 (0%)	0 (0%)
female total		0 (0%)	0 (0%)	0 (0%)	0 (0%)
male	15-29	0 (0%)	0 (0%)	0 (0%)	0 (0%)
male	30-44	2 (25%)	5 (62.5%)	1 (12.5%)	8 (100%)
male	45+	3 (23.1%)	7 (53.8%)	3 (23.1%)	13 (100%)
male total		5 (23.8%)	12 (57.1%)	4 (19.0%)	21 (100%)
female and male total		5 (23.8%)	12 (57.1%)	4 (19.0%)	21 (100%)
subadults, female and male total		5 (23.8%)	12 (57.1%)	4 (19.0%)	21 (100%)

* for code description please see Materials and methods section

Results of tooth wear analysis showed that level 1 (51.6%) and level 2 (29.1%) of tooth wear were the most common levels of tooth wear. There was no tooth without signs of tooth wear, Table 9. Males had more frequent higher levels of tooth wear (level 3 and 4) than females, and the difference was statistically significant ($X2=19.2$, $p<0.01$).

Table 9. Results of the tooth wear analysis

		Level of tooth wear Number of teeth (%)				
Gender	Age (years)	1	2	3	4	Total
subadults	0-14	31 (96.9%)	1 (3.1%)	0 (0%)	0 (0%)	32 (100%)
female	15-29	126 (64.3%)	56 (28.6%)	14 (7.1%)	0 (0%)	196 (100%)
female	30-44	118 (54.4%)	74 (34.1%)	24 (11.1%)	1 (0.5%)	217 (100%)

		Level of tooth wear Number of teeth (%)				
Gender	Age (years)	1	2	3	4	Total
female	45+	150 (53.9%)	90 (32.4%)	34 (12.2%)	4 (1.4%)	278 (100%)
female total		394 (57.0%)	220 (31.8%)	72 (10.4%)	5 (0.7%)	691 (100%)
male	15-29	208 (63.4%)	73 (22.3%)	42 (12.8%)	5 (1.5%)	328 (100%)
male	30-44	162 (44.6%)	109 (30.0%)	75 (20.7%)	17 (4.7%)	363 (100%)
male	45+	178 (37.9%)	145 (30.9%)	108 (22.9%)	39 (8.3%)	470 (100%)
male total		548 (47.2%)	327 (28.2%)	225 (19.4%)	61 (5.3%)	1161 (100%)
female and male total		942 (50.9%)	547 (29.5%)	297 (16.0%)	66 (3.6%)	1852 (100%)
subadults, female and male total		973 (51.6%)	548 (29.1%)	297 (15.8%)	66 (3.5%)	1884 (100%)

* for code description please see Materials and methods section

Discussion

Cibalae were situated on the left, higher bank of the Bosut River, and it have been continually inhabited for 8,000 years now. The cultural layer, at places 6 to 8 m thick, contains all chronological periods and prehistoric cultures, and the Celtic settlement is a direct substratum to the Roman (settlement). The first written sources mention Cibalae only in the 4th century, as the focal point of major battles: in 316 between Licinius and Constantine I, and in 351 between Constantius II and Magnentius. Zosimus thus described Cibalae as a Pannonian city, situated on a hill, to which a winding and narrow road leads, passing through a marsh and up the hill to the city, below which a plain stretched (13, 14).

Compared to the number of archaeological researches of Cibalae, the number of bioarchaeological researches is significantly smaller, especially if limited only to the oral health. Data obtained by the examination of ancient jaw and teeth provide us a valuable resources for evaluating life conditions of antique inhabitants of Cibalae. Key features of dental diseases especially caries, periapical diseases and tooth wear can be helpful in identifying of nutritional stress within a population. This makes dental paleopathology, its diagnosis and interpretation in paleodemographic contexts an important

step in the attempt of reconstruction of past lives. According to data available from relevant databases indexing high quality journals this study is the first one presenting the results of a comprehensive analysis of oral health of antique population of Cibalae (15). This study included the registration of tooth loss, number of carious teeth and carious lesions, location of carious lesions, degree of tooth destruction, periapical lesions and tooth wear, covering all pathological changes on teeth and alveolar bone available for examination on skeletal sample. This approach in oral and dental analysis of ancient remains in combination with huge sample size (more than 2000 teeth examined) provides an excellent basis for reconstruction of dietary patterns and food processing in Roman Cibalae. According to available data most people have consumed at least 70% of their daily calories in the form of cereals and legumes. Grains included several varieties of wheat as well as barley, millet, and oats (16,17). Inevitably rich people could eat better than poor people in antiquity.

More than half of the analyzed skeletal remains, which are normally kept in the Town Museum of Vinkovci, were in very good condition and well preserved (Table 1). The selection of samples wasn't made with respect to the extent of the damage, it was thought they could be damaged by excluding from the jaws of research received false low prevalence of observed parameters, primarily pathological changes. It is assumed that the bones, which were weakened while people were alive by various pathological changes of dental system, subject to rapid decay during their stay in the earthen environment and frequent mechanical damage, comparing to bones of a person who has been healthy during the lifetime (7). The erosion damages recorded in the samples were due to the degradation of collagen, resulting in a gradual loss of bone, cementum and dentin (18).

The life expectancy of the population was shortened or prolonged depending on the social-economic conditions of the life (19). If the life expectancy was shorter, the community lived in more difficult existential conditions. In ancient populations, prolonged life expectancy increased the prevalence of dental caries and antemortem tooth loss. This finding can be always expected in ancient populations, there was no adequate dental care (20), and with the time each carious tooth was in danger of being lost before death (7). There was no statistically significant difference between males and females in terms of losing teeth during the lifetime.

The ingredients dominating in the diet affected the localization of caries. In the sample of the Roman population from Cibalae we noticed the approximately equal prevalence of approximal and occlusal caries. In fact, due to the consumption of mostly solid food resulted in increased abrasion, fissure system occlusal surface is depleted and smoothed, and no longer represents predilective site of cavity (21). The crown height has been reduced by occlusal attrition. As abraded areas reduced the height of the occlusal cusps and crown, there is a physiological compensatory of growing abraded teeth up to the contact with the antagonist, which increases the exposure to the approximal root surfaces of the teeth, which thus becomes a new predilection place for caries. There was no statistically significant difference between males and females in terms of the prevalence of caries. The prevalence of caries in this sample was 5.2% in females and 4.3% in males. Compared to other continental Croatian antique sites: Štrbinci (5.9% females and 12.5% males), Osijek (15.0% females and 10.7% males), Zmajevac (6.5% females and 11.8% males) the population in Cibalae had the lower caries prevalence (5). Unfortunately, data about other oral health indicators are not available for those sites.

According to the location, higher prevalence of occlusal and approximal caries was noticed in males compared to females, while compared to males in females higher prevalence of tooth cervix caries was noticed. This suggests that women consumed softer foods that less abraded teeth what was confirmed by the results of tooth wear analysis and statistically significant difference between males and females. The statistically significant difference between males and females in the number of periapical lesions can be related to extensive carious lesions found in males.

Conclusion

Roman city Cibalae in the Vukovar-Srijem County in eastern Croatia has been continually inhabited since the Neolithic period and it was promoted to a colony with the emperor's decree at the beginning of the 3rd century. This study is the first one presenting the results of a comprehensive analysis of oral health of antique population of Cibalae. Compared to other Croatian antique sites, ancient inhabitants of Roman Cibalae had rather good dental health with low caries prevalence and no gender differences. Statistically significant difference was found between males in females in the prevalence of periapical lesions and degree of tooth wear.

References

1. Janošić I. Urbanizacija Cibala i razvoj keramičarskih središta. Zagreb: Hrvatska akademija znanosti i umjetnosti, Centar za znanstveni rad, 2001.
2. Perinić Muratović L. Odraz panonskog putovanja Septimija Severa u Cibalama. *Arheološki radovi i rasprave* 2004;14(1):77-102.
3. Hincak Z, Drmic-Hofman I, Mihelic D. Anthropological analysis of neolithic and Early Bronze Age skeletons--a classical and molecular approach (East Slavonia, Croatia). *Collegium antropologicum* 2007;31(4):1135-1141.
4. Slaus M, Pecina-Slaus N, Brkic H. Life stress on the Roman limes in continental Croatia. *Homo : internationale Zeitschrift fur die vergleichende Forschung am Menschen* 2004;54(3):240-263.
5. Šlaus M. The bioarchaeology of continental Croatia. Oxford: Archaeopress., 2002.
6. Novak M, Slaus M. Bone traumas in late antique populations from Croatia. *Collegium antropologicum* 2010;34(4):1239-1248.
7. Watt ME, Lunt DA, Gilmour WH. Caries prevalence in the permanent dentition of a mediaeval population from the south-west of Scotland. *Archives of oral biology* 1997;42(9):601-620.
8. Šlaus M. Bioarheologija. Zagreb: Školska knjiga, 2006.
9. Lovejoy CO. Dental wear in the Libben population: its functional pattern and role in the determination of adult skeletal age at death. *American journal of physical anthropology* 1985;68(1):47-56.
10. Alt KW, Rosing FW, Teschler-Nicola M. Dental anthropology, Fundamentals, Limits and Prospects. Wien: Springer-Verlag, 1998.
11. Iscan MY, Kennedy KAR. Reconstruction of Life from the Skeleton. New York: Alan R. Liss Inc, 1989.
12. Larsen IB, Westergaard J, Stoltze K, Larsen AI, Gyntelberg F, Holmstrup P. A clinical index for evaluating and monitoring dental erosion. *Community dentistry and oral epidemiology* 2000;28(3):211-217.
13. Rapan Papeša A. Topography of Cibalae in Late Antiquity. *Opuscula Archaeologica* 2011;35(1):189-224.
14. Krznarić Škrivanko M. Monografija Vinkovaca - Vinkovci u prapovijesti. Vinkovci: Matica Hrvatska, 2010.
15. Peko D. The analysis of enamel hypoplasia on teeth of a skeletal population from Roman Vinkovci–Cibalae, Croatia. *Bulletin of the International Association for Paleodontology* 2013;7(1):12-21.
16. Garnsey P. Cambridge Ancient History: The High Empire A.D. 70–192. Cambridge: Cambridge University Press, 2000.

17. Wilkins J. Good food and bad: Nutritional and pleasurable eating in ancient Greece. *Journal of ethnopharmacology* 2015.

18. Beeley JG, Lunt DA. The nature of the biochemical changes in softened dentine from archeological sites. *Journal of Archaeological Science* 1980;7:371-377.

19. Manzi G, Salvadei L, Vienna A, Pssarello P. Discontinuity of life conditions at the transition from the Roman Imperial Age to the early Middle Ages: Example from central Italy evaluated by pathological dento-alveolar lesions. *American Journal of Human Biology* 1999;11(3):327-341.

20. Marthaler TM. Dentistry between pathology and cosmetics. *Community dentistry and oral epidemiology* 2002;30(1):3-15.

21. Kerr NW, Bruce MF, Cross JF. Caries experience in the permanent dentition of late mediaeval Scots (1300-1600 a.d.). *Archives of oral biology* 1988;33(3):143-148.

Sažetak

Rimsko naselje Cibale (Vinkovci) – rodno mjesto rimskih careva Valentinijana I. i njegova brata Valena – bilo je veoma razvijeno urbano središte u kasnoantičkom razdoblju, što je potvrđeno brojnim arheološkim nalazima. Svrha je ovog rada steći uvid u oralno zdravlje antičkih stanovnika Cibala i dobivene podatke usporediti s drugim hrvatskim antičkim lokalitetima. Pregledano je 100 osoba s 2041 zubom koji su datirani u razdoblje 3. do 5. stoljeće prije Krista. Analizirani su zubni karijes, prijesmrtni gubitak zuba, periapikalne bolesti i trošenje zuba. Prevalencija prijesmrtnog gubitka zuba bila je 4,3% u muškaraca i 5,2% u žena. Prevalencija karijesa po zubu bila je 8,4% u muškaraca i 7,0% u žena. U usporedbi s drugim hrvatskim antičkim lokalitetima, drevni stanovnici rimskih Cibala imali su relativno dobro oralno zdravlje s niskom učestalosti karijesa i bez spolnih razlika. Statistički značajna razlika između muškaraca i žena pronađena je u prevalenciji periapikalnih lezija i stupnja potrošenosti zuba. Periapikalne lezije pronađene su samo u muškaraca.

Ključne riječi: *antika; prevalencija karijesa; paleostomatologija; Hrvatska.*