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BIOLOŠKE KARAKTERISTIKE KOSTURA POKOPANIH U GLAGOLJAŠKOJ ULICI U ZADRU

BIOLOGICAL CHARACTERISTICS OF THE SKELETONS BURIED IN GLAGOLJAŠKA STREET IN ZADAR

Antropološka analiza provedena je na 11 kostura od čega je šest muškaraca, jedna žena i četvero djece. Radi jednakog geografskog smještaja i klimatsko-ekološkog sustava rezultati analize uspoređeni su s uzorkom koji potječe s Relje. U odnosu na komparativni uzorak rezultati su pokazali lošije zdravlje u svim kategorijama što je prvenstveno posljedica loše prehrane i teških životnih uvjeta koji se posebno reflektiraju u visokoj učestalosti pokazatelja biološkog stresa, zdravlja zuba i teškog fizičkog rada. Traume evidentirane na muškarcima uglavnom su posljedica nesretnih slučajeva dok znakovi međuljudskog nasilja nisu zamijećeni. Na temelju svih promatranih kriterija, u skladu s razmišljanjima arheologa, može se zaključiti da je zaista riječ o izdvojenoj skupini ljudi koja je drugačije (nekvalitetnije) živjela i nakon smrti bila drugačije pokopana.

Ključne riječi: antropološka analiza, biološki pokazatelji stresa, dentalno zdravlje, teški fizički rad

An anthropological analysis was carried out on 11 skeletons – six adult male skeletons, one adult female skeleton and four subadults. The results of the analysis were compared with the sample from Relja site, given the latter's identical geographical location and climate-environmental system. Compared with the Relja sample, the analyses results showed that the individuals buried in Glagoljaška Street had been of poorer health in all categories – primarily a consequence of bad nourishment and hard living conditions, which are particularly reflected in the high frequency of biological stress indicators, dental health and hard labor. The traumas observed on the males were mostly caused by accidents, while signs of interpersonal violence were not noticed. Based on the criteria observed and in accordance with the archaeologists' line of thought, it can be concluded it was indeed an isolated group of people who led a different (lower-quality) way of life and had different burials after death.

Key words: anthropological analysis, biological stress indicators, dental health, hard labor

UVOD

Tijekom svibnja i srpnja mjeseca 2009. godine Arheološki muzej Zadar izveo je zaštitna arheološka istraživanja na položaju Glagoljaške ulice i ulice Put Murvice u Zadru. Tom prilikom evidentirano je 13, a istraženo 10 grobova. Riječ je isključivo o kosturnim ukopima. Kod šest grobova zabilježeno je pokapanje u konstrukcijama načinjenim od tegula, u tri slučaja pokojnici su pokopani u amforama, a četiri pokojnika su pokopana u običnu zemljanu jamu. Prilozi u grobovima su u potpunosti izostali. Specifične forme ukopa sugeriraju datiranje ovog dijela nekropole u kasnu antiku,[1] međutim radiokarbonski datum ukazuje na konac 1. i 2. stoljeća kao vrijeme njenog nastanka (usmeno priopćenje Vučić J.).

REZULTATI ANTROPOLOŠKE ANALIZE

Antropološka analiza uključivala je procjenu spola, starosti te patologija koristeći standardne antropološke metode.[2] Radi malog uzorka treba s oprezom uzeti usporedbe s drugim nalazištima.

Analiza je provedena na ukupno 11 kostura koji potječu iz 10 grobova (grob 13 sadržavao je dva ukopa) od čega je šest muškaraca (54,5%), jedna žena (9,1%) i četvero djece (36,4%).

Sve odrasle osobe u Glagoljaškoj umrle su između 30. i 40. godine života. Prosječna starost odraslih osoba iznosi 34,4 godine, a najviša je smrtnost zabilježena u dobnoj skupini od 31. do 35. godine kad umire 71,4% od svih odraslih osoba i 45,5% od ukupnog uzorka. Najveća smrtnost djece u Glagoljaškoj zabilježena je između 1. i 3. godine života kada umire 75% od ukupnog broja djece i 27,3% od ukupnog uzorka.

Cribra orbitalia je u čitavom uzorku iz Glagoljaške prisutna na četiri od osam dobro uščuvanih orbita. Zabilježena je kod sve troje djece sa dobro uščuvanim orbitama, a samo je jedno dijete imalo aktivnu *cribra orbitalia* u trenutku smrti.

Ektokranijalna poroznost prisutna je na ukupno četiri od osam dobro sačuvanih lubanja; kod djece je ona uočena na jednoj od tri lubanje, a kod odraslih na tri od pet lubanja.

Ukupna učestalost hipoplazije zubne cakline po zubu kod odraslih osoba iznosi 46,7% (7/15).[3]

Nespecifični periostitis kod odraslih iz Glagoljaške prisutan je na šest od sedam osoba (85,7%) sa jednim slučajem u aktivnom obliku (Sl. 1). Kod djece iz Glagoljaške

INTRODUCTION

In May and June 2009, Archaeological Museum Zadar carried out rescue excavations at the Glagoljaška Street and Murvice Road site in Zadar. Thirteen graves were discovered and ten of them were examined. They were all skeletal burials. In six graves the remains were interred in tegulae-made structures, in three cases they were interred in amphorae, and four persons were buried in plain earth graves. None of the burials contained grave goods. While the specific types of the burials suggest that this part of the necropolis should be dated to the Late Antiquity,[1] the radiocarbon dating indicates the late 1st century and 2nd century AD as the period it was built in (as verbally conveyed by J. Vučić).

ANTHROPOLOGICAL ANALYSIS RESULTS

The anthropological analysis included identification of sex, age and pathologies, using standard anthropological methods.[2] As the sample was small, comparisons with other sites should be taken with a caution.

A total of 11 skeletons from 10 graves (Grave no. 13 contained two burials) were analyzed – six males (54.5%), one female (9.1%) and four subadults (36.4%).

All adults in Glagoljaška Street died between 30 and 40 years of age. The average age of the adults was 34.4 years and the highest mortality rate was recorded in the 31-35 age groups (in which 71.4% of all the adults and 45.5% of the whole sample died). The highest mortality rate among subadults in Glagoljaška Street was recorded between 1 and 3 years of age, when 75% of all the subadults and 27.3% of the whole sample died.

In the whole Glagoljaška Street sample, *cribra orbitalia* was found on four out of eight well-preserved eye orbits. All three subadults with well preserved eye orbits exhibited *cribra orbitalia* but only one child had an active *cribra orbitalia* at the time of death.

Ectocranial porosity was found on four out of eight well-preserved skulls. In subadults, it was found on one out of three skulls and in adults on three out of five skulls.

The overall frequency of dental enamel hypoplasia per tooth in adults is 46.7% (7/15).[3]

Non-specific periostitis was found on six out of seven (85.7%) individuals from Glagoljaška Street, including one active periostitis (Figure 1). As regards the Glagoljaška Street subadults, non-specific periostitis was found on two out of four well-preserved skeletons, in both cases in active form.

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1   J. Vučić, 2010, 539-540.
2   J. Buikstra – D. Ubelaker, 1994; A. C. Aufderheide – C. Rodriguez-Martin, 1998; D. Ortner, 2003.
3   Hipoplazija zubne cakline se najčešće pojavljuje na prednjim zubima (sjekutićima i očnjacima), pa su zbog toga u analiziranom uzorku podaci o učestalosti te patologije prikupljeni za središnje sjekutiće gornje čeljusti te za očnjake gornje i donje čeljusti s lijeve strane. Ukoliko taj zub nije bio prisutan, pregledan je desni zub. Podaci su prikupljani samo za odrasle osobe.

1   J. Vučić, 2010, 539-540.
2   J. Buikstra – D. Ubelaker, 1994; A. C. Aufderheide – C. Rodriguez-Martin, 1998; D. Ortner, 2003.
3   As dental enamel hypoplasia usually occurs on front teeth (incisors and canines), the frequency data for this pathology on the analyzed sample were obtained for the central incisors on the upper jaw and for the canines on the left side of the upper and lower jaws. If this tooth was missing, its right-side equivalent was analyzed. The frequency data were collected for adults only.

Slika 1. Blagi zarasli periostitis na desnoj goljeničnoj kosti muškarca iz groba 4.

Figure 1. Mild healed periostitis on right tibia of male from Grave no. 4.

foto / photo: **Ž. Bedić**

nespecifični periostitis zabilježen je na dva od četiri dobro uščuvana kostura te je u oba slučaja zabilježen u aktivnom obliku.

Učestalost karijesa po zubu kod odraslih osoba iz Glagoljaške iznosi 21,3% (34/160), a kod djece 5,5% (3/55). Alveolarna oboljenja evidentirana su na 21 od 161 alveole (13,0%) kod odraslih osoba (Sl. 2) i na 1 od 48 dječjih alveola (2,1%).

Učestalost osteoartritisa na kralješcima iznosi 8,3% (13/156), a na zglobovima 14,3% (4/28) te su u tri slučaja osteoartritične promjene evidentirane na koljenima, a u jednom slučaju na laktovima.

Schmorlovi defekti u Glagoljaškoj zabilježeni su na 32 od 117 kralježaka (27,4%). Na kostima muškaraca su evidentirani benigni kortikalni defekti koji svjedoče o intenzivnoj fizičkoj aktivnosti: *fosse rhomboide* na ključnim kostima četiri muškarca (Sl. 3), *pectoralis maior* na nadlaktičnim kostima dva muškarca te *teres maior* na nadlaktičnim kostima jednog muškarca. Na odraslim je osobama ukupno prisutno 6 kortikalnih defekata na 13 nadlaktičnih kostiju (46,2%) i 5 izraženih *fosse rhomboide* na 13 ključnih kostiju (38,5%).

U Glagoljaškoj su ulici zabilježeni još neki markeri vezani uz teži fizički rad. Kod tri od sedam (42,9%) odraslih osoba (na dva muškarca i jednoj ženi) prisutne su *squatting facets*. *Osteochondritis dissecans* zabilježen je na desnoj skočnoj kosti muškarca iz groba 5, a *vastus notch* na desnom iveru muškarca iz groba 4.

Caries frequency per tooth in the Glagoljaška Street adults was 21.3% (34/160) and in the subadults 5.5% (3/55). Alveolar diseases were observed on 21 out of 161 alveolae (13.0%) in adults (Figure 2) and on 1 out of 48 subadults' alveolae (2.1%).

The frequency of vertebral osteoarthritis was 8.3% (13/156) and the one of joint osteoarthritis was 14.3% (4/28). Osteoarthritic changes on knees were recorded in three cases and on elbows in one case.

Schmorl's nodes in Glagoljaška Street were found on 32 out of 117 vertebrae (27.4%). Benign cortical defects were found on bones of males, evidencing intensive physical activities: *rhomboid fossae* on the clavicles of four males (Figure 3), *pectoralis maior* on the humeri of two males and *teres maior* on the humeri of one male. In the adults, a total of 6 cortical defects on 13 humeri (46.2%) and 5 pronounced *rhomboid fossae* on 13 clavicles (38.5%) were found.

Some other hard labor-related markers were recorded in Glagoljaška Street. Three out of seven (42.9%) adults (two males and a female) had *squatting facets*. *Osteochondritis dissecans* was found on the right talus of the male from Grave no. 5 and *vastus notch* was found on the right patella of the male from Grave no. 4.

A total of six antemortem fractures were found on four male skeletons. A depressed fracture with round edges (16x7mm) can be seen on the frontal bone of the male from Grave no. 1. The male from Grave no. 2 has a slightly thickened lateral part of the right clavicle, probably a result of a well-healed fracture. The skeleton from Grave no. 5 has two fractures: the one on the right fifth rib is manifested in a mild callus and mild, healed periostitis and the one on the distal articular surface of the right tibia is manifested in several fracture lines. The male from Grave no. 7 has a slightly thickened forearm (the distal third of

Slika 2. Apsces na lijevoj strani gornje čeljusti muškarca iz groba 1.
Figure 2. Abscess on left side of maxilla of male from Grave no. 1.
foto / photo: **Ž. Bedić**

Ukupno je prisutno šest antemortalnih fraktura kod četiri muška kostura. Na lijevoj čeonoj kosti glave muškarca iz groba 1 prisutna je depresijska fraktura zaobljenih rubova dimenzija 16×7 mm. Muškarac iz groba 2 ima blago zadebljan lateralni dio desne ključne kosti što je najvjerojatnije posljedica dobro zarasle frakture. Kostur iz groba 5 ima dvije frakture: na desnom 5. rebru fraktura se očituje po blagom kalusu i blagom zaraslom periostitisu dok se fraktura na distalnoj zglobnoj plohi desne goljenične kosti očituje po nekoliko linija frakture. Kod muškarca iz groba 7 blago je zadebljana desna podlaktica (distalna trećina dijafize lakatne i palčane kosti) što je vjerojatno rezultat dobro zarasle frakture. Ukupno je na pet dobro uščuvanih glava prisutna samo jedna fraktura, a na 97 dobro uščuvanih dugih kostiju četiri frakture (4,1%).

Prosječna visina izračunata na temelju visine bedrenih kostiju muškaraca iznosi 176,2±3,94 cm gdje je najniži muškarac bio visok 173,6±3,94 cm, a najviši 180,4±3,94

the ulna and radius diaphysis), probably a result of a well-healed fracture. In total, only one fracture was found on five well-preserved skulls and four fractures were found on 97 well-preserved long bones (4.1%).

The average height calculated based on the height of male femurs is 176.2±3.94cm, with the shortest male having being 173.6±3.94cm tall and the highest one 180.4±3.94cm.[4] The height of the single female was also calculated based on the femur height and it was 152.4±3.72cm.

DISCUSSION

The demographic features and pathological changes of the bone sample from Glagoljaška Street were compared with the sample from the Zadar – Relja necropolis, the latter one mostly dated to the 3rd and 4th centuries AD.[5] The reason for this lies in the fact that no results of the analyses of the 1st and 2nd-century bone samples from the eastern Adriatic have been published so far. The material belonging to that period is mostly cremated and, as such, is not suitable for comparisons with a non-cremated material. As

4   The height was calculated based on the regression formula developed by Trotter and Gleser in 1952.
5   M. Novak, 2008.

cm.[4] Visina jedine žene također izračunata na temelju visine bedrene kosti iznosi 152,4±3,72 cm.

DISKUSIJA

Demografske karakteristike i patološke promjene koštanog uzorka iz Glagoljaške ulice uspoređene su sa uzorkom s nekropole Zadar – Relja koji je većinom datiran u 3. i 4. stoljeće.[5] Razlog tome je što do sada nisu objavljeni rezultati istraživanja koštanog materijala s istočne obale Jadrana iz razdoblja 1. i 2. stoljeća. Većinom je materijal koji pripada tom razdoblju spaljen i nije adekvatan za usporedbu s nespaljenim materijalom. Pošto je Glagoljaška ulica dio groblja antičkog Zadra gdje su otkriveni brojni antički i kasnoantički grobovi logično je napraviti komparaciju s pripadnicima populacija koji su bili dio istog geografskog smještaja i klimatsko-ekološkog sustava unatoč tome što je riječ o nešto kasnijem razdoblju.

Postoje sličnosti i razlike u demografskim obilježjima između analiziranih uzoraka iz Glagoljaške ulice i Relje. U Relji je od analiziranih 255 osoba 111 muškaraca, 80 žena i 64 djece. U oba uzorka broj žena je podzastupljen u odnosu na muškarce – u Relji za 1,4 puta, dok u Glagoljaškoj za čak 6 puta. Razlog tome može biti što nalazište nije u cijelosti istraživano pošto je riječ bila o zaštitnim arheološkim iskopavanjima. Međutim, takva je situacija zabilježena u dva antička koštana uzorka iz Italije. U uzorku iz Casal Bertonea koji je datiran u 2.-3. stoljeće bila su prisutna 54 muškarca i 24 žene, dok je u uzorku iz Castellaccio Europarca (treća faza groblja datirana u 1.-2. st.) bilo prisutno 24 muškaraca i 7 žena.[6] Slično kao i u Glagoljaškoj ulici, oba spomenuta talijanska nalazišta karakteriziraju jednostavni ukopi u obične rake ili u grobove pod tegulama u kojima gotovo da nije bilo nalaza. Na temelju toga arheolozi su zaključili da je riječ o nižem socijalnom sloju pokopanom u blizini industrijskog kompleksa (štavionice i čistionice odjeće) u slučaju Casal Bertonea i rustikalnog kompleksa gdje se prerađivalo grožđe i masline u slučaju Castellaccio Europarca.[7] Sukladno tome Killgrove navodi da je moguće da je razlog podzastupljenosti žena taj što su za takve poslove prije bili angažirani muškarci i adolescenti nego žene.[8]

Prosječna starost odraslih osoba iz Relje iznosi 38,0, a u Glagoljaškoj 34,4 godine što je u prosjeku dosta kraće, međutim nije statistički značajno vjerojatno uslijed malog analiziranog uzorka iz Glagoljaške (χ^2=1,276; P=0,259). Distribucija smrtnosti po petogodišnjim intervalima u oba

Glagoljaška Street was part of the ancient Zadar's cemetery where numerous Antiquity and Late Antiquity graves were found, it is logical to make comparisons with members of the populations who had shared the same geographical location and the same climate-environmental system, although they had lived in a somewhat later period.

The demographic features of the analyzed samples from Glagoljaška Street and Relja show both similarities and differences. Of the 255 analyzed skeletons from Relja, there were 111 males, 80 females and 64 subadults. In both samples, the number of females is underrepresented compared to males – 1.4 times in Relja and as much as 6 times in Glagoljaška Street, the reason probably being that the site has not been researched fully yet because only rescue archaeological excavations were carried out there. However, such representation was also observed in two Italian skeletal samples from the antique period. The Casal Bertone sample, dated to the 2nd-3rd centuries AD, included 54 males and 24 females, whereas the Castellaccio Europarco sample (the third phase of the cemetery dated to the 1st-2nd centuries AD) included 24 males and 7 females.[6] Similarly as in Glagoljaška Street, both Italian sites are characterized by plain burials in ordinary grave pits or in graves under tegulae containing almost no grave goods. This fact led archaeologists to conclude that the deceased persons had belonged to a lower social class and that they had been buried near an industrial complex (a tannery and a fullery) in the case of Casal Bertone and near a rustic complex where grapes and olives were processed in the case of Castellaccio Europarco.[7] Based on that, Killgrove argues that the reason for the underrepresentation of females could be the fact that men and adolescents were more likely to be hired for such jobs than women.[8]

The average age at death in Relja is 38.0 and that of the Glagoljaška Street sample is 34.4. While it is rather short on average, it is not statistically significant – probably due to the small size of the Glagoljaška Street sample (χ^2=1.276; P=0.259). The mortality rate distribution per five-year intervals on both sites have shown similarities in the mortality rate of adults (between 31-35 years of age). Although Killgrove does not give the exact average age at death, the highest mortality rate in both Italian samples was recorded among those between 31 and 40 years of age.

The highest mortality in subadults was recorded in similar age groups, between 1 and 5 years of age. For children, this particular age is a very sensitive period because this is when they switch from breastmilk-based nourishment to food and water full of microorganisms that cause various contagious diseases accompanied with diarrhea.[9]

4   Visina je izračunata na temelju regresijske formule koju su razvili Trotter i Gleser 1952.
5   M. Novak, 2008.
6   K. Killgrove, 2010, 162.
7   S. Musco – P. Catalano – A.Caspio – W. Pantano – K. Killgrove, 2008; K. Killgrove, 2010, 85-86.
8   K. Killgrove, 2010, 80.

6   K. Killgrove, 2010, 162.
7   S. Musco – P. Catalano – A.Caspio – W.Pantano – K. Killgrove, 2008; K. Killgrove 2010, 85-86.
8   K. Killgrove, 2010, 80.
9   M. Rowland – S. Rowland – T.J. Cole, 1988.

nalazišta pokazala je sličnosti u smrtnosti odraslih osoba (između 31. i 35. godine). Iako Killgrove ne donosi točnu prosječnu doživljenu starost, najveća smrtnost u oba uzorka iz Italije evidentirana je u dobnoj skupini između 31. i 40. godine života.

Najveća smrtnost djece u oba uzorka zabilježena je u sličnim dobnim skupinama, između 1. i 5. godine života. Kod djece je to izuzetno osjetljivo razdoblje jer prestaje dojenje i prelazi se s prehrane temeljene na majčinom mlijeku na prehranu i vodu koje su prepune raznih mikroorganizama koji uzrokuju razne zarazne bolesti praćene dijarejom.[9]

Razlika u ukupnoj učestalosti *cribra orbitalia* između uzorka iz Glagoljaške ulice i Relje (50% naprama 20,1%) je granično statistički značajna (χ^2=3,923; P=0,047). Oba uzorka iz Italije imaju vrlo niske ukupne učestalosti *cribra orbitalia* (Casal Bertone 17,5%; Castellaccio Europarco 13,6%).[10]

Učestalost ektokranijalne poroznosti je u Glagoljaškoj ulici vrlo visoka (50%), no ne može se usporediti s Reljom jer na tom uzorku ova patologija nije analizirana. Kao što je slučaj i s *cribra orbitalia*, dva talijanska uzorka imaju vrlo niske učestalosti ektokranijalne poroznosti (Casal Bertone 1,0%; Castellaccio Europarco 9,0%).[11]

Uzorak iz Glagoljaške ulice ima nešto manje učestalosti hipoplazije zubne cakline od uzorka iz Relje (46,7% naprama 61,1%), međutim ta razlika nije statistički značajna (χ^2=0,39; P=0,261) vjerojatno zbog malog analiziranog uzorka iz Glagoljaške. U uzorcima iz talijanskih nalazišta korištena je drugačija metodologija odnosno hipoplazija zubne cakline bilježena je na svim zubima pa usporedba s Glagoljaškom ulicom nije primjerena.

Evidentna je razlika i u učestalosti nespecifičnog periostitisa između odraslih osoba iz Glagoljaške i Relje što je i statistički značajno (χ^2=3,833; P=0,01). Djeca iz Relje imaju nešto višu učestalost nespecifičnog periostitisa od djece iz Glagoljaške (66,7% naprama 50%), međutim, ta razlika nije statistički značajna (χ^2=0,012; P=0,50). Uzorci iz Italije su ponovno karakteristični po nižim učestalostima nespecifičnog periostitisa (23,8% u Casal Bertoneu i 35,5% Castellaccio Europarcu)[12] i sličniji su uzorku iz Relje.

S obzirom na jednaki ekološki sustav bilo bi za očekivati da su učestalosti bioloških pokazatelja stresa između Relje i Glagoljaške ulice slične, međutim *cribra orbitalia*, hipoplazija zubne cakline i nespecifični periostitis su u gotovo svim kategorijama viši u uzorku iz Glagoljaške u odnosu na komparativni uzorak iz Relje. Osim tih patologija koje su se mogle usporediti sa uzorkom iz Relje, učestalosti ektokranijalne poroznosti su također vrlo visoke u Glagoljaškoj ulici što je vidljivo ukoliko se promotre vrijednosti u dva

The difference between the overall frequency of *cribra orbitalia* in the Glagoljaška Street sample and the Relja sample (50% compared to 20.1%) is only of marginal statistical significance (χ^2=3.923; P=0.047). Both Italian samples have very low overall *cribra orbitalia* frequencies (Casal Bertone 17.5%; Castellaccio Europarco 13.6%[10]).

Although the frequency of ectocranial porosity in Glagoljaška Street is very high (50%), it cannot be compared with Relja, because this pathology has not been analyzed on the latter sample. As in the case of *cribra orbitalia*, the two Italian samples have very low ectocranial porosity frequencies (Casal Bertone 1,0%; Castellaccio Europarco 9.0%[11]).

The frequency of dental enamel hypoplasia in Glagoljaška Street is somewhat lower than the one in the Relja sample (46.7% compared to 61.1%). However, the difference is not statistically significant (χ^2=0.39; P=0.261), probably because the analyzed sample from Glagoljaška Street was small. For the samples from the Italian sites, a different methodology was used (dental enamel hypoplasia was recorded on all teeth), so comparing them with the Glagoljaška Street samples would not be adequate.

There is also an obvious difference between the frequencies of non-specific periostitis in adults from Glagoljaška Street and Relja, respectively; it is statistically significant (χ^2=3.833; P=0.01). The Relja subadults manifest a somewhat higher frequency of non-specific periostitis than the Glagoljaška Street subadults(66.7% compared to 50%). However, the difference is not statistically significant (χ^2=0.012; P=0.50). The Italian samples are also characterized by lower frequencies of non-specific periostitis (23.8% in Casal Bertone and 35.5% in Castellaccio Europarco[12]). As such, they are more similar to the Relja sample.

Given the identical ecological system, one would expect that the Relja and Glagoljaška Street exhibited similar frequencies of biological stress indicators. However, in almost all categories, *cribra orbitalia*, dental enamel hypoplasia and non-specific periostitis are higher in the Glagoljaška Street sample than in the comparative Relja sample. In addition to these pathologies, comparable with the Relja sample, the ectocranial porosity frequencies are also very high in the Glagoljaška Street sample. It becomes more apparent if the values from the two Italian sites are observed. These pathologies, particularly in childhood, are triggered by various factors such as anemia (caused by inadequate nourishment), metabolic disorders, parasitism, contagious diseases, starvation etc.[13] It would mean that

9   M. Rowland – S. Rowland – T. J. Cole, 1988.
10   K. Killgrove, 2010, 101.
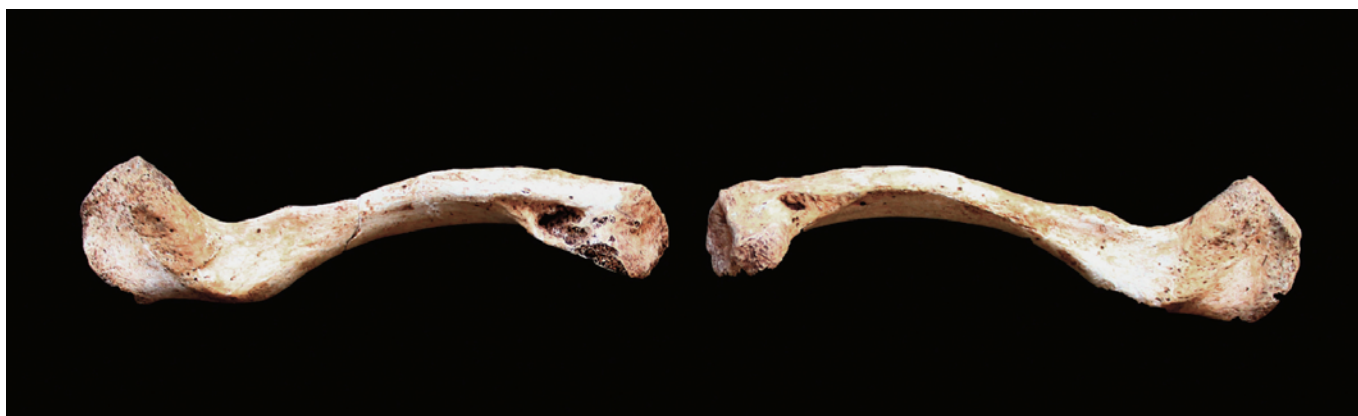11   K. Killgrove, 2010, 102.
12   K. Killgrove, 2010, 108.

10   K. Killgrove, 2010, 101.
11   K. Killgrove, 2010, 102.
12   K. Killgrove, 2010, 108.
13   P. Stuart-Macadam, 1991; D. Ortner, 2003; M. Brickley – R. Ives, 2008; P.L. Walker – R.R. Bathurst – R. Richman – T. Gjerdrum – V.A. Andrushko, 2009; D. Guatelli-Steinberg – J.R. Lukacs, 1999.

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Slika 3. Jako naglašena *fossa rhomboidea* na desnoj ključnoj kosti muškarca iz groba 2.

Figure 3. Very prominent rhomboid fossa on right clavicle of male from Grave no. 2.

foto / photo: **Ž. Bedić**

talijanska nalazišta. Na nastanak ovih patologija, osobito tijekom djetinjstva, utječu razni čimbenici poput anemije uzrokovane neadekvatnom prehranom, metaboličkim poremećajima, parazitizmom, zaraznim bolestima, glađu i dr.[13] To bi značilo da je populacija pokopana u Glagoljaškoj ulici bila izložena većem fiziološkom stresu, odnosno vjerojatno je živjela u lošijim uvjetima i prehranjivala se nekvalitetnijom hranom od komparativnog uzorka pokopanog na Relji, kao i od dva talijanska uzorka.

Da je bila riječ o drugačijoj prehrani potvrđuje i učestalost karijesa kod odraslih osoba u Glagoljaškoj ulici koja je u usporedbi s Reljom četiri puta viša što je i statistički značajno (χ^2=68,021; P<0,001). Razlika je evidentirana i u učestalosti alveolarnih oboljenja (χ^2=5,27; P=0,01). Dva talijanska nalazišta imaju niže učestalosti karijesa (4,9% u Casal Bertoneu i 8,3% u Castellaccio Europarcu)[14] i sličnije su vrijednostima zabilježenim u Relji.

Na temelju Turnerovih istraživanja provedenih 1979. godine Lukacs[15] je zaključio da se najniže učestalosti karijesa pojavljuju u populacijama koje su svoju privredu bazirale na lovu, ribolovu i sakupljanju plodova (0,0-5,3%), nešto više učestalosti u populacijama koje žive od lova i poljoprivrede (0,44-10,3%), a najveće u onim društvima koja su se bavila isključivo poljoprivredom (2,3-26,5%). Moguće je stoga da se populacija iz Glagoljaške ulice prehranjivala namirnicama biljnog podrijetla, odnosno onima koje su imale veći udio ugljikohidrata. Takve su namirnice sastavljene od škroba i šećera koje u ustima potiču rast bakterija i stvaranje

the population buried in Glagoljaška Street was exposed to a major physiological stress – in other words, they must have lived in poorer conditions and consumed lower-quality food than the comparative sample buried at Relja and the two Italian samples.

The frequency of caries in the Glagoljaška Street adults, four times higher than in the Relja sample – which is also statistically significant (χ^2=68.021; P<0,001) – confirms that their diet was different. The difference can also be seen in the frequency of alveolar diseases (χ^2=5.27; P=0.01). The two Italian sites exhibit lower caries frequencies (4.9% in Casal Bertone and 8.3% in Castellaccio Europarco[14]), more similar to those recorded at Relja.

Based on the Turner's research carried out in 1979, Lukacs[15] concluded that the lowest caries frequencies occurred in the populations whose economy had been based on hunting, fishing and gathering (0.0-5.3%), somewhat higher in the populations dependent on hunting and agriculture (0.44-10.3%) and the highest in the societies which had made their living by agriculture only (2.3-26.5%). It is thus possible that the Glagoljaška Street population's diet was based on vegetable food, which contained a higher share of carbohydrates. Such food consists of starch and sugars, which stimulate the growth of oral bacteria and the creation of dental plaque, thus causing high caries frequencies.[16] Such a conclusion would be in keeping with the Roman historical sources stating that cereals (wheat, barley, millet) were the staple food of lower classes (who consumed *puls* – cooked cereals mixed with water, salt and a little oil – as a substitute for bread).[17] A meal also included wine, various vegetables (higher classes ate beans, lentils and turnip and the lower ones onions, garlic and peas[18]), lard, some fruit and olives. Meat was not consumed often.[19]

13   P. Stuart-Macadam, 1991; D. Ortner, 2003; M. Brickley – R. Ives, 2008; P. L. Walker – R. R. Bathurst – R. Richman – T. Gjerdrum – V. A. Andrushko, 2009; D. Guatelli-Steinberg – J. R. Lukacs, 1999.
14   K. Killgrove, 2010, 142.
15   J. R. Lukacs, 1989.

14   K. Killgrove, 2010, 142.
15   J.R. Lukacs, 1989.
16   H.A. Gutherie, 1979.
17   V. Neri, 1985.
18   A. Dosi – F. Schnell, 1990.
19   G. Maddoli, 1969.

naslaga na zubima, a time uzrokuju visoke učestalosti karijesa.[16] Takav bi zaključak bio u skladu s rimskim povijesnim izvorima koji donose da su žitarice (pšenica, ječam, proso) bile osnovni element prehrane nižih klasa koje su konzumirale *puls* (kaša od žitarica pomiješana s vodom, soli i malo ulja) kao zamjenu za kruh.[17] Uz to, jelo se sastojalo i od vina, različitog povrća (viša klasa upotrebljavala je grah, leću i repu, a niža luk, češnjak i grašak),[18] masti, nešto voća i maslina. Meso se nije često konzumiralo.[19]

Kao što su pokazale pojedine studije,[20] karijesi su bili vjerojatno najvažniji uzročnik za nastanak alveolarnih oboljenja i u populaciji iz Glagoljaške jer su zabilježene učestalosti značajno više u odnosu na komparativna nalazišta.

Kako su se hranili pripadnici populacije pokopani u Glagoljaškoj ulici moglo bi se djelomice rekonstruirati na temelju analize stabilnih izotopa muškarca starosti 30 do 35 godina iz groba 4.[21] Omjeri između izotopa ugljika i dušika u tijelu (koštanom kolagenu) svjedoče o vrsti prehrane tijekom života nekog pojedinca. Na temelju dobivenih rezultata može se zaključiti da se prehrana ovog muškarca bazirala na C_3 namirnicama odnosno žitaricama (pšenici i ječmu, bez ili s vrlo malo prosa), povrću i raznim vrstama voća, uz zanemarivu konzumaciju morske hrane i proteina životinjskog podrijetla (usmeno priopćenje Novak. M). Rezultati analize stabilnih izotopa od željeznog doba do ranog srednjeg vijeka na području Ravnih kotara pokazali su da se prehrana Liburna u željeznom dobu sastojala od C_3 namirnica bez dokaza o konzumaciji C_4 prehrane odnosno prosa. S rimskim osvajanjem ovih područja počela se konzumirati i morska hrana iako je C_3 prehrana ostala vrlo važna.[22] Prema tome bi muškarac iz Glagoljaške ulice po svojim prehrambenim navikama bio sličniji liburnskim populacijama koje su nastanjivale Ravne kotare nego rimskoj analiziranoj populaciji čiji uzorci najvećim dijelom potječu sa Relje.

Na temelju analize stabilnih izotopa u dva talijanska nalazišta pokazalo se da su bazu prehrane činile žitarice, masline i vino uz dodatak mesa, ribe, povrća i prosa u različitim omjerima i iz drugačijih izvora. Populacija iz Casal Bertonea koja je živjela bliže Rimu pokazuje prehranu sa određenom količinom morskih proteina, dok populacija iz Castellaccio Europarca koja je živjela u *suburbiu* pokazuje veću konzumaciju prosa. Unatoč jakim trgovačkim vezama u Rimu u to doba i uvozu namirnica iz raznih dijelova carstva, pripadnici

As some studies have shown[20], caries was probably the single most important cause of alveolar diseases in the Glagoljaška Street population, because their frequencies are substantially higher than at comparative sites.

The diet of the population buried at the Glagoljaška Street site can be partially reconstructed owing to the stable isotope analysis of the male from Grave no. 4, aged between 30 and 35.[21] The proportion of carbon and nitrogen isotopes in the body (bone collagen) can be seen as evidence of an individual's diet during their lifetime. The results thus obtained lead to the conclusion that the diet of this particular male was based on C_3 plants: cereals (wheat and barley, without or with very little millet), vegetables and various fruits, with negligible proportion of seafood and animal proteins (as verbally related by Novak M.). The results of the stable isotope analyses of skeletons from the period between Iron Age and Early Middle Ages in the Ravni kotari area (Dalmatian hinterland) showed that the Iron Age diet of the Liburni consisted of C_3 plants; no evidence of consuming C_4 plants (millet) was found. When the Romans had conquered the region, seafood also became part of the diet, but C_3 plants remained very important.[22] Consequently, the diet of the male from the Glagoljaška Street would be more similar to the diet of the Liburnian populations of Ravni kotari than to the diet of the analyzed Roman population whose samples mostly originate from Relja.

The stable isotope analysis carried out on the samples from the Italian sites showed that the staple food included cereals, olives and wine, with meat, fish, vegetable and millet components in various proportions and from various sources. The diet of the Casal Bertone population, who lived closer to Rome, included certain quantities of sea proteins and the diet of the Castellaccio Europarco population, who lived in a *suburbio,* included a substantial share of millet. Despite Rome's strong trade connections at that time and import of foodstuffs from various parts of the Empire, members of lower classes consumed the food that came from their immediate environment.[23]

Interestingly, Killgrove carried out a strontium isotope analysis the results of which could be seen as evidence of migration processes.[24] The analysis showed that seven individuals (four males and three subadults) from the two Italian sites had different proportions of strontium in them. For this reason, they were characterized as immigrants. Generally, the health of these populations was much better than that of other Roman populations in Italy and of the populations analyzed in this paper. However, if only

16   H. A. Gutherie, 1979.
17   V. Neri, 1985.
18   A. Dosi – F. Schnell, 1990.
19   G. Maddoli, 1969.
20   J. Littleton – B. Frohlich, 1993; S. Hillson, 2000.
21   Analiza stabilnih izotopa napravljena je u 14CHRONO Centre, Queens University Belfast; omjer C:N iznosi 3,15, vrijednost $\delta^{13}C$= - 19,3, a $\delta^{15}N$=8,4.
22   E. Lightfoot – M. Šlaus – T. O'Connell, 2012.

20   J. Littleton – B. Frohlich., 1993.; S. Hillson, 2000.
21   The stable isotope analysis was carried out in 14CHRONO Centre, Queens University Belfast; the C:N ratio is 3.15, the value of $\delta^{13}C$= - 19.3 and $\delta^{15}N$=8.4.
22   E. Lightfoot – M. Šlaus – T. O'Connell, 2012.
23   K. Killgrove, 2010, 179-180.
24   K. Killgrove, 2010a, 169.

nižeg društvenog statusa konzumirali su hranu koja je bila u njihovom neposrednom okruženju.[23]

Zanimljivo je da je Killgrove napravila analizu izotopa stroncija koja svjedoči o migracijskim procesima.[24] Pokazalo se da je drugačije omjere stroncija u oba talijanska nalazišta imalo sedam osoba (četiri muškarca i troje djece) te su okarakterizirani kao doseljenici. Općenito zdravlje tih populacija je mnogo bolje u usporedbi s ostalim rimskim populacijama iz Italije, ali i analiziranih populacija u ovom radu. No ako se u obzir uzmu samo osobe s drugačijim omjerima stroncija vidljivo je da je njihovo opće, ali i dentalno zdravlje bilo lošije, prehrana nekvalitetnija te da su obavljali teže fizičke poslove.

Uzorak iz Relje ima više učestalosti osteoartritisa na kralješcima (14,8% naprama 8,3%) što je i statistički značajna razlika (χ^2=4,952; P<0,05). Učestalost osteoartritisa na zglobovima je također viša u Relji (25,3% naprama 14,3%), ali ta razlika nije statistički značajna (χ^2=1,715; P=0,190). Međutim, treba uzeti u obzir da se uzorak odraslih osoba iz Glagoljaške ulice sastoji od osoba starosti između 30. i 40. godine života što su u načelu mlađe osobe pa bi ih trebalo uspoređivati i sa mlađim osobama iz Relje. Kod mlađih osoba iz Relje učestalost osteoartritisa na kralješcima iznosi 2,5%, a na zglobovima 2,7%. Mnogo veće učestalosti degenerativnog osteoartritisa na kralješcima i zglobovima u Glagoljaškoj naspram Relje pokazale su se statistički značajnima (χ^2=12,56; P<0,001; χ^2=5,807; P<0,05). Pošto na stvaranje osteoartritisa ponajviše utječu mehanički stres i fizička aktivnost[25] može se zaključiti da je populacija iz Glagoljaške ulice obavljala poslove koji su zahtijevali teški fizički rad. Iako se na temelju učestalosti osteoartritisa može procijeniti količina fizičkog rada koju je neka populacija obavljala, nažalost specifične aktivnosti ili zanimanja ne mogu se iščitati.[26] Također se pokazalo da unatoč uobičajenoj korelaciji osteoartritisa i starije životne dobi, u Glagoljaškoj ulici mlađe osobe su bile te koje su pokazale visoke učestalosti ove patologije.

O teškom fizičkom radu svjedoče i dvostruko više učestalosti Schmorlovih defekata koje su u usporedbi s onima iz Relje ponovo statistički značajne (χ^2=20,526; P<0,001). Schmorlovi defekti svjedoče o jakim mehaničkim opterećenjima kralježnice.[27] U dva talijanska nalazišta osteoartritis i Schmorlovi defekti su analizirani, međutim, metodologija se razlikuje pa rezultati nisu pogodni za komparaciju sa rezultatima iz Glagoljaške ulice.

Izražena mišićna hvatišta prisutna su ukupno na četiri od sedam odraslih osoba. Benigni kortikalni defekti koji su u ovoj analizi evidentirani na ključnim i nadlaktičnim

the individuals with different proportions of strontium are taken into account, we can see that their general health – and their dental health – were poorer, that their diet was of a lower quality and that they performed hard labor.

The Relja sample exhibits a higher frequency of vertebral osteoarthritis (14.8% compared to 8.3%), which is a statistically significant difference (χ^2=4.952; P<0.05). The frequency of osteoarthritis of joints in the Relja sample is also higher (25.3% compared to 14.3%), but that difference is not statistically significant (χ^2=1.715; P=0.190). However, we should take into account that the sample of the Glagoljaška Street adults consists of individuals between 30 and 40 years of age. As these are, in principle, younger individuals, they ought to be compared with the younger individuals from Relja. In the latter ones, the frequency of vertebral osteoarthritis is 2.5% and the one of osteoarthritis on the joints is 2.7%. The much higher frequencies of degenerative vertebral and joint osteoarthritis of the Glagoljaška Street sample compared to the Relja sample turned out to be statistically significant (χ^2=12.56; P<0.001; χ^2=5.807; P<0.05). As osteoarthritis mostly occurs due to mechanical stress and physical activity,[25] we can conclude that the Glagoljaška Street population performed the jobs that required hard labor. Although the frequency of osteoarthritis can help us assess the quantity of physical labor that a population performed, it does not reveal their specific activities or professions.[26] It also turned out that, despite the usual correlation between osteoarthritis and old age, in the Glagoljaška Street sample it was the younger individuals who exhibited high frequencies of this pathology.

Another evidence of hard physical labor can be found in the almost twice higher frequencies of Schmorl's nodes which, compared with the ones from Relja, are statistically significant again (χ^2=20.526; P<0.001). Schmorl's nodes indicate a high mechanical load exerted on the spine.[27] Osteoarthritis and Schmorl's nodes were also analyzed in the samples from the two Italian sites; however, another methodology was used, so the results cannot be compared with those obtained for the Glagoljaška Street sample.

Prominent points of muscular attachment can be seen on four out of seven adults.

The benign cortical defects found on the clavicles and humeri during the analysis are usually explained with excessive use of muscles.[28] In the Relja sample, 11 cortical defects were found on 191 humeri (5.7%). No analysis of the prominence of the *rhomboid fossa* on the clavicles has been carried out. Again there is a substantial difference in the frequencies of benign cortical defects between the

23   K. Killgrove, 2010, 179-180.
24   K. Killgrove, 2010a, 169.
25   A. J. Hough – L. Sokoloff, 1989.
26   T. Waldron, 1994.
27   G. Schmorl – H. Junghanns, 1971.

25   A. J. Hough – L. Sokoloff, 1989.
26   T. Waldron, 1994.
27   G. Schmorl – H. Junghanns, 1971.
28   D. Resnick – G. Greenway, 1982.

kostima najčešće se vežu uz pretjeranu uporabu mišića.[28] U Relji je na 191 nadlaktičnoj kosti prisutno 11 kortikalnih defekata (5,7%), a analiza koja uključuje izraženost *fosse rhomboide* na ključnim kostima nije rađena. U komparaciji učestalosti benignih kortikalnih defekata između Glagoljaške ulice i Relje ponovno postoji značajna razlika (χ^2=20,98; P<0,001), a ta je pojava još jedan dokaz da je populacija pokopana u Glagoljaškoj obavljala teže fizičke poslove od populacije pokopane na Relji. Killgrove je u uzorku iz Casal Bertonea također evidentirala pokazatelje pretjerane uporabe mišića na gornjem dijelu tijela te ih povezuje sa repetitivnim pokretima poput dizanja i ljuljanja naprijed nazad.[29]

Squatting facets nastaju kao posljedica specifičnog položaja – čučanja koji je definiran učestalim savijanjem koljena i gležnjeva što uzrokuje specifične koštane markere na distalnim goljeničnim kostima i skočnim kostima kada su donji ekstremiteti u hiperdorzifleksiji.[30] Ta je pojava zabilježena u raznim arheološkim populacijama.[31] U studiji koju je provela Boulle[32] na koštanom materijalu od antike do novog vijeka, zamijetila je da učestalost lateralnih *squatting facets* na skočnim kostima (promatrala ih je u kombinaciji sa distalnim goljeničnim kostima) opada od kraja kasnog srednjeg vijeka radi određenih promjena: peći su zamijenile ognjišta, uvedeni su mnogi oblici namještaja koji su omogućili više sjedenja, a mehanizacija određenih aktivnosti poput poljoprivrede nije više zahtjevala hiperdorzifleksiju. Ona također donosi učestalost *squatting facets* za rimsku populaciju iz La Favorite u Francuskoj iz 1. i 2. stoljeća koja iznosi 45,2% što je vrlo slično učestalosti iz Glagoljaške ulice iako treba uzeti u obzir da je riječ o puno manjem uzorku. U La Favorite je ta pojava kod žena statistički značajno učestalija što se objašnjava činjenicom da su žene radile poslove vezane uz pripremu jela i prilikom toga bile u položaju čučnja.[33] Takvu usporedbu u Glagoljaškoj nije moguće raditi jer je riječ o samo dva muškarca i jednoj ženi koji su imali *squatting facets*. Prema Baykaru i suradnicima[34] na pojavu *squatting facets* utječu životni uvjeti, habitualne aktivnosti, proizvodnja i općenito teški uvjeti rada. Ne može se pretpostaviti koji su mehanizmi utjecali na pojavu ovih markera u Glagoljaškoj ulici, međutim neke od navedenih dnevnih aktivnosti u spomenutoj studiji mogli su obavljati i pripadnici populacije pokopani u Glagoljaškoj: kuhanje hrane, pečenje kruha, pletenje, tkanje, rad u polju, oranje, mljevenje žitarica, poslovi vezani uz stočarstvo, mužnja životinja, brušenje kamena, izrada keramike.

Glagoljaška Street and Relja samples (χ^2=20.98; P<0.001), which can be seen as another proof that the population buried in Glagoljaška Street performed harder labor than the one buried in Relja. In the Casal Bertone sample, Killgrove also found indicators of excessive use of muscles in the upper parts of the bodies. She attributed them to such repetitive motions like lifting and swinging back and forth.[29]

Squatting facets occur as a result of a specific position – squatting. This position is defined with frequent bending of knees and ankles, which creates specific bone markers on the distal tibiae and tali when the lower limbs are in hyperdorsiflexion.[30] This phenomenon was recorded in various archaeological populations.[31] In her study carried out on the skeletal material from the period spanning Antiquity and Modern Age, Boulle[32] noticed that the frequency of lateral *facets* on tali (observed in combination with distal tibiae) started dropping at the end of the Late Middle Ages due to some changes: hearths were replaced by stoves, newly introduced pieces of furniture enabled more sitting and mechanization of some activities eliminated hyperdorsiflexion. She also established that the frequency of *squatting facets* in the Roman population from La Favorite in France (1st and 2nd centuries AD) was 45.2%. It is very similar to the frequency established in the Glagoljaška Street sample, although we should take into account that the latter sample is much smaller. In the females of La Favorite, this phenomenon is much more statistically significant. It is explained with the fact that women performed tasks related to preparation of meals, which required squatting.[33] Such a comparison cannot be made for Glagoljaška Street because only two males and one female from that sample had *squatting facets*. According to Baykara *et al*.,[34] *squatting facets* occur as a result of living conditions, habitual activities, production and hard working conditions in general. While we cannot specify the mechanisms that triggered the occurrence of these markers in the population buried at Glagoljaška Street, we can presume that some of the daily activities specified in the above mentioned study could have also been performed by its members: cooking, baking bread, knitting, weaving, field work, plowing, wheat grinding, cattle-growing activities, milking, stone whetting, pottery making.

In the context of hard labor, *osteochondritis dissecans* observed in one male should be mentioned. It usually occurs as a result of a direct trauma or frequent microtraumas

28   D. Resnick – G. Greenway, 1982.
29   K. Killgrove, 2010a, 169.
30   D. H. Ubelaker, 1979.
31   M. Satinoff, 1972; I. H. Oygucu – M. Kurt, 1998; E. L. Boulle, 1998; I. Baykara – H. Yılmaz – T. Gültekin – E. Güleç, 2010.
32   E. L. Boulle, 1998, 53-54.
33   E. L. Boulle, 1998, 54.
34   I. Baykara – H. Yılmaz – T. Gültekin – E. Güleç, 2010, 1259.

29   K. Killgrove, 2010a, 169.
30   D.H. Ubelaker, 1979.
31   M.Satinoff, 1972; I.H. Oygucu – M. Kurt, 1998; E.L. Boulle, 1998; I. Baykara – H. Yılmaz – T. Gültekin – E. Güleç, 2010.
32   E.L. Boulle, 1998, 53-54.
33   E.L. Boulle, 1998, 54.
34   I. Baykara – H. Yılmaz – T. Gültekin – E. Güleç, 2010, 1259.

U kontekstu teškog fizičkog rada potrebno je spomenuti *osteochondritis dissecans* koji je zabilježen kod jedne muške osobe, a obično nastaje kao posljedica direktne traume ili učestalih mikrotrauma kod sportaša ili kod onih koji su opterećeni teškim fizičkim radom[35] i *vastus notch* na iveru drugog muškarca koji se obično pojavljuje kod onih čije je koljeno dugotrajno savinuto kao na primjer u položaju čučnja.[36]

Sve traume zabilježene u uzorku iz Glagoljaške ulice su antemortalne, odnosno nastale su davno prije smrti i dobro su zarasle. Traume na ključnoj kosti, rebru, goljeničnoj kosti i distalnoj podlaktici mogu se pripisati nesretnim slučajevima. Traume na palčanim kostima posljedica su pada na ispružene ruke,[37] a i frakture ključnih kostiju često nastaju prilikom pada kada rame preuzima najveći udarac, a mogu nastati kao posljedica pada s konja ili rada s velikim domaćim životinjama.[38] Jednako tako, frakture proksimalnih i distalnih goljeničnih kostiju često su rezultat konstantnih opterećenja kao i pada s visine.[39] Jedina trauma koja bi se mogla pripisati namjernom nasilju bila bi trauma na lijevoj strani čeone kosti muškarca iz groba 1. Napadač je u najvećem broju slučajeva dešnjak te je sukladno tome udarac najčešće usmjeren prema lijevoj strani glave napadnute osobe.[40] Međutim, namjerno nasilje smatra se sigurnim u slučajevima kada su traume na lakatnim kostima praćene drugim pokazateljima namjernog nasilja, odnosno perimortalnim traumama (nastale u/oko trenutka smrti) ili visokom učestalošću trauma glave.[41]

Učestalost trauma dugih kostiju u Relji je niska – 1,9%, dok je učestalost trauma na glavama relativno visoka – 23,3%. Između Relje i Glagoljaške ne postoje statistički značajne razlike što je vjerojatno posljedica malog uzorka (duge kosti: χ^2=2,131; P=0,144; glava: χ^2=0,029; P=0,864). Za razliku od Glagoljaške ulice, u uzorku iz Relje zabilježene su traume koje su nedvojbeno nastale kao rezultat nasilja manjeg intenziteta o čemu svjedoči relativno velik broj trauma na glavi, ali i dvije perimortalne traume.[42]

Killgrove je na temelju trauma evidentiranih u Casal Bertoneu i Castellaccio Europarcu zaključila da je u većini slučajeva riječ o traumama koje se mogu pripisati nesretnim slučajevima, a da je pojedine zarasle traume koje bi se mogle protumačiti kao rezultat međuljudskog nasilja teško dokazati.[43]

Prosječna visina muškaraca u Glagoljaškoj ulici (176 cm; sd=2,756) je gotovo 8 cm viša od muškaraca iz Relje

typical of athletes and those performing hard labor.[35] Also, it is significant to mention *vastus notch* noticed on the patella of another male. It usually occurs in those whose knees are bent over prolonged periods of time, such as when crouching.[36]

All the traumas found on the Glagoljaška Street sample are antemortem. In other words, they had occurred long before death and they healed well. The traumas on the clavicles, ribs, tibiae and distal forearms can be attributed to accidents. Those on the radii occurred when a person fell on their extended arms.[37] The fractures on clavicles also often occur after a fall, when the shoulder absorbs most of the blow (such fractures would happen as a result of falling from a horse or of working with large domestic animals).[38] The fractures on the proximal and distal tibiae also occur as a result of a constant load and after a fall from high above.[39] The only trauma that could be attributed to intentional violence is the one on the left side of the frontal bone of the male from Grave no. 1. As the attackers are in most cases right-handed, blows are usually directed to the left side of the victim's head.[40] However, intentional violence is considered proven only if the traumas on the ulnae are accompanied with other indicators of intentional violence or perimortem traumas (inflicted in/near the time of death), or with a high frequency of head traumas.[41]

In the Relja sample, the frequency of long bone trauma is relatively low – 1.9%, while the frequency of head traumas is relatively high – 23.3%. The fact that there are no statistically significant differences between Relja and Glagoljaška Street is probably due to the fact that the sample is small (long bones: χ^2=2.131, P=0.144; head: χ^2=0.029, P=0.864). Unlike the Glagoljaška Street sample, the Relja sample exhibited traumas that had beyond doubt been made as a result of violence of minor intensity, as evidenced by a relatively large number of head traumas and two perimortem traumas.[42]

Based on the traumas established in Casal Bertone and Castellaccio Europarco, Killgrove concluded that most of them could be attributed to accidents. As for some healed traumas that could be interpreted as a result of interpersonal violence, in her opinion it was hard to prove.[43]

The average height of the Glagoljaška Street males (176cm; sd=2.756) is almost 8cm higher than of those from Relja (168.2cm), which is a large difference. However, as the data on the individual heights from the Relja sample

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35   J. R. Schenck – R. C. Goodnight – J. Marc, 1996; S. Orava – K. Virtanen, 1982.
36   L. Capasso – K. A. R. Kennedy – C. A. Wilczak, 1999.
37   D. Ortner, 2003.
38   M. A. Judd – C. A. Roberts, 1999.
39   S. M. Abel, 2004; C. S. Bartlett – L. S. Weiner – E. C. Yang, 1997.
40   M. P. Djurić – C. A. Roberts – Z. B. Rakočević – D. D. Djonić – A. R. Lešić, 2006; L. S. Owens, 2007.
41   M. A. Judd – C. A. Roberts, 1999; M. O. Smith, 1996.
42   M. Novak, 2008, 186.
43   K. Killgrove, 2010, 112.

35   J.R. Schenck – R.C. Goodnight – J. Marc, 1996; S. Orava – K. Virtanen, 1982.
36   L. Capasso – K.A R. Kennedy, C.A. Wilczak, 1999.
37   D. Ortner, 2003.
38   M.A. Judd – C.A.Roberts, 1999.
39   S.M. Abel, 2004; C.S. Bartlett – L.S. Weiner – E.C. Yang, 1997.
40   M.P. Djurić – C.A. Roberts – Z.B. Rakočević – D.D. Djonić – A.R. Lešić, 2006; L.S. Owens, 2007.
41   M.A. Judd – C. A.Roberts, 1999; M.O. Smith, 1996.
42   M. Novak, 2008, 186.
43   K. Killgrove, 2010, 112.

(168,2 cm) što je velika razlika, međutim podaci za pojedinačne visine uzorka iz Relje nisu dostupni pa se ne može reći da li je ta razlika i statistički značajna. Muškarci iz dva talijanska nalazišta su po prosječnoj visini (167 cm) slični muškarcima iz Relje. Jedina žena iz Glagoljaške ulice je niža (152,4 cm) od prosječne visine žena iz Relje (156,1) za 3,7 cm, međutim, kako je riječ o vrlo malom uzorku iz Glagoljaške usporedba nije primjerena. Žene iz Casal Bertonea i Castellaccio Europarca su u prosjeku bile visoke 157 i 150 cm. Osim genetske komponente, na visinu tijekom razvoja utječu i okolišni faktori kao što je prehrana, psihosocijalni stres, bolesti i životni uvjeti.[44] Barry Bogin je zajedno sa suradnicima na temelju jednog istraživanja suvremenih populacija zaključio da bolja prehrana i manje patoloških stanja generiraju viši rast.[45] Takav se zaključak na uzorak iz Glagoljaške ulice ne može primjeniti jer su tamo patologije na koje utječu neadekvatna prehrana, zarazne bolesti i drugi faktori vrlo visoke. Ovo pitanje i dalje ostaje otvoreno.

ZAKLJUČAK

Nakon podrobne antropološke analize koštanih ostataka s nalazišta Glagoljaška ulica rezultati potvrđuju zaključak arheologa da bi se ovu grupaciju grobova zaista moglo gledati kao izdvojenu skupinu. Naime, već prilikom analize bilo je jasno da u demografskoj strukturi dominiraju mlađi muškarci robusnije građe vrlo lošeg dentalnog zdravlja. Uz to su daljnje analize pokazale i vrlo visoku učestalost pokazatelja biološkog (*cribra orbitalia*, ektokranijalna poroznost, hipoplazija zubne cakline i nespecifični periostitis) i fizičkog stresa koji je u korelaciji s teškim fizičkim radom (degenerativni osteoartritis, Schmorlovi defekti i benigni kortikalni defekti). U usporedbi s populacijom iz Relje koja je živjela na istom geografskom području i u istim ekološkim uvjetima, populacija iz Glagoljaške ulice pokazuje u svim kategorijama osim visine lošije zdravstveno stanje. Zbog toga se postavlja pitanje je li uzorak iz Glagoljaške pripadao drugačijoj populaciji u socijalnom smislu pa je možda riječ o nižem društvenom sloju o čemu svjedoče jednostavni ritus pokapanja i nedostatak nalaza u grobovima. Analiza stabilnih izotopa provedena na uzorku samo jednog kostura iz Glagoljaške ulice pa je stoga treba uzimati s oprezom, pokazala je drugačiju (siromašniju) prehranu u odnosu na populaciju pokopanu na Relji, a koja se poglavito bazira na žitaricama (pšenici i ječmu) bez konzumacije morskih proteina te je po tome sličnija prehrani Liburna. S druge strane demografska struktura s podzastupljenošću žena vrlo je slična dvama talijanskim nalazištima Casal Bertoneu i Castellaccio Europarcu koji se

are not available, we cannot say whether this difference is also statistically significant or not. By their average height (167cm), the males from the two Italian sites are similar to the males from Relja. The only female from Glagoljaška Street (152.4cm) is 3.7cm shorter than the average height of the Relja females (156.1cm). However, as the Glagoljaška Street sample is very small, no adequate comparison could be made. On average, the women from Casal Bertone and Castellaccio Europarco were between 157 and 150cm tall. Besides by the genetic component, one's height during development is influenced by the environmental factors such as diet, psychosocial stress, diseases and living conditions.[44] Based on a study of recent populations, Barry Bogin and his associates concluded that a better diet and fewer pathological conditions result in a larger height.[45] This conclusion cannot be applied to the Glagoljaška Street sample because its pathologies influenced by inadequate diet, contagious diseases and other factors are very high. This question remains open for the time being.

CONCLUSIONS

The results of the detailed anthropological analysis of the bone remains from the Glagoljaška Street site have confirmed the archaeologists' conclusion that these graves should be considered as a separate group. Even during the analysis, it became clear that their demographic structure was dominated by robust, younger men of poor dental health. Also, further analyses indicated very high frequencies of the biological stress (*cribra orbitalia*, ectocranial porosity, dental enamel hypoplasia and non-specific periostitis) and physical stress, the latter one in correlation with hard labor (degenerative osteoarthritis, Schmorl's nodes and benign cortical defects). Compared to the Relja population, who lived on the same geographical location and in the same climate-environmental system, the Glagoljaška Street population exhibits a poorer health condition in all categories but height. The question thus arises if the Glagoljaška Street sample belonged to a different population in terms of their social position – if it could have been a lower class (which is indicated by plain burial rituals and absence of grave goods). A stable isotope analysis that was carried out on only one Glagoljaška Street skeleton (and should therefore be taken with reserve), shoed a different (poorer) diet compared to the one of the population buried at Relja. It was primarily based on cereals (wheat and barley) and it did not include sea proteins. As such, it is more similar to the diet typical of the Liburni. On the other hand, the demographic structure characterized by the underrepresentation of women is very similar to the

44   G. D. Batty – M. J. Shipley – D. Gunnell – R. Huxley – M. Kivimäki – M. Woodward – C. M. Lee – G. D. Smith, 2009, 137-152.
45   B. Bogin, 1998.

44   G.D. Batty – M.J. Shipley – D. Gunnell – R. Huxley – M. Kivimäki – M. Woodward – C.M. Lee – G.D. Smith, 2009, 137–152.
45   B. Bogin, 1998.

datiraju u slično razdoblje. Killgrove navodi da je mogući razlog tome preferencija u odabiru radne snage (muškaraca i adolescenata) za poslove koji su se obavljali u gospodarskim objektima koji su se nalazili u neposrednoj blizini spomenutih groblja, a izvan rimskih gradskih zidina. Njezina je analiza pokazala da je određen broj ljudi pokopan na tim grobljima pripadao doseljenicima koji su živjeli lošije od ostatka populacije. U tom kontekstu bilo bi zanimljivo napraviti analize stroncija pripadnika populacije pokopane u Glagoljaškoj ulici ne bi li se ustanovilo da li je isto riječ o doseljenicima ili nekoj sličnoj skupini ljudi.

one of two Italian sites – Casal Bertone and Castellaccio Europarco– dated to a similar period. According to Killgrove, a possible reason for this was the selection of workforce: men and adolescents were a preferred choice for the jobs performed in the facilities in the immediate vicinity of these cemeteries outside the Rome's city walls. Killgrove's analysis showed that some of the people buried at there had been immigrants, who had lived worse than the rest of the population. In this context, it would be interesting to carry out a strontium isotope analysis of the population buried in Glagoljaška Street in order to establish whether they also belonged to immigrants or a similar group of people.

Grob 1

Stupanj uščuvanosti korteksa: odličan.
Spol: muškarac.
Starost u trenutku smrti: 30 do 35 godina.
Patološke promjene: umjerena zarasla ektokranijalna poroznost prisutna je na kaloti lubanje. Na lijevoj strani čeone kosti prisutna je antemortalna depresijska fraktura dimenzija 16×7 mm. Blago izražena *fossa rhomboidea* prisutna je na lijevoj ključnoj kosti. Schmorlovi defekti prisutni su na dva prsna kralješka. Blagi degenerativni osteoartritis (OA) prisutan je na jednom slabinskom kralješku i križnoj kosti. Umjereni degenerativni OA prisutan je na jednom slabinskom kralješku. Jaki degenerativni OA prisutan je na dva slabinska kralješka. Na distalnim goljeničnim kostima prisutne su *squatting facets*.
Asocirani materijalni ostaci ili životinjske kosti: nisu prisutni.
Procijenjena prosječna tjelesna visina osobe: 175,2±3,72 cm.

Grob 2

Stupanj uščuvanosti korteksa: odličan.
Spol: muškarac.
Starost u trenutku smrti: 30 do 35 godina.
Patološke promjene: blaga zarasla ektokranijalna poroznost prisutna je na kaloti lubanje. Lateralni kraj lijeve ključne kosti je blago zadebljan - vjerojatno je riječ o dobro zarasloj antemortalnoj frakturi. Jako izražena *fossa rhomboidea* prisutna je na desnoj ključnoj kosti. Benigni kortikalni defekti prisutni su na hvatištima mišića *pectoralis maior* obje nadlaktične kosti. Schmorlovi defekti prisutni su na sedam prsnih kralježaka. Blagi degenerativni OA prisutan je na lijevom koljenu. Blagi zarasli periostitis prisutan je na goljeničnim i lisnim kostima. Na zubima su prisutni hipoplastični defekti.
Asocirani materijalni ostaci ili životinjske kosti: dvije životinjske kosti.
Procijenjena prosječna tjelesna visina osobe: 174,0±3,72 cm.

Grob 3

Stupanj uščuvanosti korteksa: odličan.
Spol: dijete.
Starost u trenutku smrti: 8 do 9 godina.
Patološke promjene: blaga zarasla *cribra orbitalia* (*CO*) prisutna je u orbitama. Blaga zarasla ektokranijalna poroznost prisutna je na kaloti lubanje. Blagi aktivni periostitis prisutan je na skočnim i petnim kostima.
Asocirani materijalni ostaci ili životinjske kosti: životinjske kosti.

Grave no. 1

Condition of cortex: Excellent.
Sex: Male.
Age at death: 30 to 35 years.
Pathological changes: Mild healed ectocranial porosity on the skull. Antemortem depressed fracture (16x7mm) on left side of frontal bone. Slight *rhomboid fossa* on left clavicle. Schmorl's nodes on two thoracic vertebrae. Mild degenerative osteoarthritis (OA) on one lumbar vertebra and sacral bone. Moderate degenerative OA on one lumbar vertebra. Severe degenerative OA on two lumbar vertebrae. *Squatting facets* visible on distal tibiae.
Associated material remains or animal bones: None.
Estimated average body height: 175.2±3.72cm.

Grave no. 2

Condition of cortex: Excellent.
Sex: Male.
Age at death: 30 to 35 years.
Pathological changes: Mild healed ectocranial porosity on the skull. Lateral end of left clavicle is slightly thickened – probably a well-healed antemortem fracture. Very marked *rhomboid fossa* on right clavicle. Benign cortical defects on points of attachment of *pectoralis maior* on both humeri. Schmorl's nodes on seven thoracic vertebrae. Mild degenerative OA on left knee. Mild healed periostitis on tibiae and fibulae. Hypoplastic defects can be seen on the teeth.
Associated material remains or animal bones: Two animal bones.
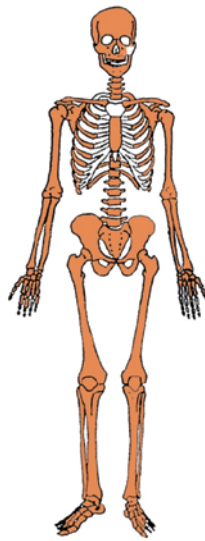*Estimated average body height:* 174.0±3.72cm.

Grave no. 3

Condition of cortex: Excellent.
Sex: Subadult.
Age at death: 8 to 9 years.
Pathological changes: Mild healed *cribra orbitalia* (*CO*) in eye orbits. Mild healed ectocranial porosity on the skull. Mild active periostitis on tali and calcanei.
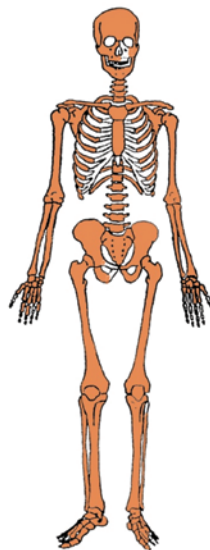*Associated material remains or animal bones:* Animal bones.
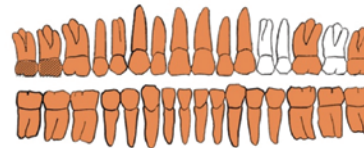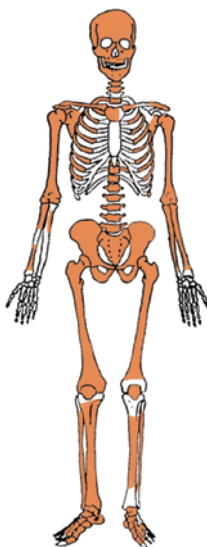
GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces /
Alveolar abscess present

GROB / GRAVE 1

GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces /
Alveolar abscess present

GROB / GRAVE 2

GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces /
Alveolar abscess present

GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces /
Alveolar abscess present

GROB / GRAVE 3

Grob 4

Stupanj uščuvanosti korteksa: odličan.
Spol: muškarac.
Starost u trenutku smrti: 30 do 35 godina.
Patološke promjene: blaga zarasla *CO* prisutna je u orbitama. Blaga zarasla ektokranijalna poroznost prisutna je na kaloti lubanje. Schmorlovi defekti prisutni su na pet prsnih kralježaka. Blagi zarasli periostitis prisutan je na goljeničnim kostima, a lokalizirani zarasli periostitis na lijevoj bedrenoj, desnoj goljeničnoj i lisnoj kosti. Na 5. slabinskom kralješku prisutna je spondiloliza. Spondiloliza je defekt na kralježnici, najčešće na 4. i 5. slabinskom kralješku, a karakterizira ga stres fraktura luka kralješka. Danas često nastaje kod adolescenata sportaša koji se preforsiraju, a učestalost u populaciji varira od 3 do 6%. Na zubima su prisutni hipoplastični defekti.
Asocirani materijalni ostaci ili životinjske kosti: nisu prisutni.
Procijenjena prosječna tjelesna visina osobe: 180,4±3,72 cm.

Grob 5

Stupanj uščuvanosti korteksa: odličan.
Spol: muškarac.
Starost u trenutku smrti: 30 do 35 godina.
Patološke promjene: blago izražene *fosse rhomboide* prisutne su na obje ključne kosti. Schmorlov defekt prisutan je na jednom slabinskom kralješku. Blagi degenerativni OA prisutan je na lijevom koljenu, dva prsna i jednom slabinskom kralješku. Blagi aktivni lokalizirani periostitis prisutan je na lijevoj lakatnoj te obje goljenične kosti. Blagi zarasli periostitis prisutan je na bedrenim, goljeničnim i lisnim kostima. Na distalnoj zglobnoj plohi desne goljenične kosti prisutna je antemortalna fraktura koja se očituje po više linija fraktura. Antemortalna fraktura također je prisutna na desnom vjerojatno 5. rebru, a očituje se po blagom kalusu i zaraslom periostitisu. Na desnoj skočnoj kosti prisutan je *osteochondritis dissecans*. Na pojedinim kostima šaka i stopala prisutne su promjene u obliku poroziteta i lezija.
Asocirani materijalni ostaci ili životinjske kosti: životinjske kosti.
Procijenjena prosječna tjelesna visina osobe: 176,8±3,72 cm.

Grob 6

Stupanj uščuvanosti korteksa: odličan.
Spol: žena.
Starost u trenutku smrti: 30 do 35 godina.
Patološke promjene: blagi degenerativni OA prisutan je na laktovima i jednom prsnom kralješku. Blagi zarasli periostitis prisutan je na goljeničnim i lisnim kostima. Schmorlovi defekti prisutni su na četiri prsna i tri slabinska kralješka. Na distalnim goljeničnim kostima prisutne su *squatting facets*. Na zubima su prisutni hipoplastični defekti.
Asocirani materijalni ostaci ili životinjske kosti: životinjske kosti.
Procijenjena prosječna tjelesna visina osobe: 152,4±2,47 cm.

Grave no. 4

Condition of cortex: Excellent.
Sex: Male.
Age at death: 30 to 35 years.
Pathological changes: Mild healed *CO* in eye orbits. Mild healed ectocranial porosity on the skull. Schmorl's nodes on five thoracic vertebrae. Mild healed periostitis on tibiae and localized healed periostitis on left femur and right tibia and fibula. Spondylolysis on 5th lumbar vertebra. Spondylolysis is a spinal defect, usually on the 4th and 5thlumbar vertebrae. It is characterized by a stress fracture on the vertebral arch. Today it frequently occurs in adolescent athletes who overexert themselves. The frequency in the population ranges between 3% and 6%. Hypoplastic defects can be seen on the teeth.
Associated material remains or animal bones: None.
Estimated average body height: 180.4±3.72cm.

Grave no. 5

Condition of cortex: Excellent.
Sex: Male.
Age at death: 30 to 35 years.
Pathological changes: Slight *rhomboid fossae* on both clavicles. Schmorl's nodes on one lumbar vertebra. Mild degenerative OA on left knee, two thoracic vertebrae and one lumbar vertebra. Mild active localized periostitis on left ulna and both tibiae. Mild healed periostitis on femurs, tibiae and fibulae. Antemortem fracture with several fracture lines on distal articular surface of right tibia. Antemortem fracture also on right, probably 5th rib, manifested with mild callus and healed periostitis. *Osteochondritis dissecans* on right talus. Changes like porosity and lesions on some hand and foot bones.
Associated material remains or animal bones: Animal bones.
Estimated average body height: 176.8±3.72 cm.

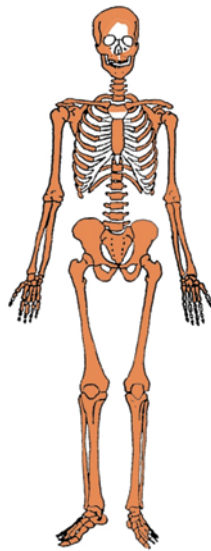**Grave no. 6**

Condition of cortex: Excellent.
Sex: Female.
Age at death: 30 to 35 years.
Pathological changes: Mild degenerative OA on elbows and on one thoracic vertebra. Mild healed periostitis on tibiae and fibulae. Schmorl's nodes on four thoracic and three lumbar vertebrae. *Squatting facets* on distal tibiae. Hypoplastic defects can be seen on the teeth.
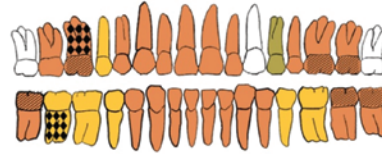*Associated material remains or animal bones:* Animal bones.
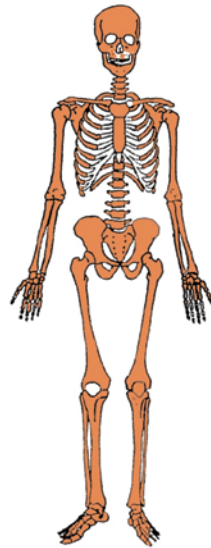*Estimated average body height:* 152.4±2.47 cm.

GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)
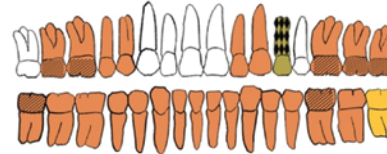
DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
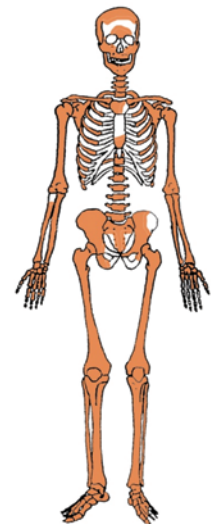prisutan alveolarni apsces / Alveolar abscess present

GROB / GRAVE 4
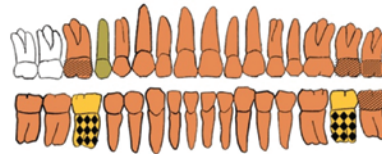
GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces / Alveolar abscess present

GROB / GRAVE 5

GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces / Alveolar abscess present

GROB / GRAVE 6

Grob 7

Stupanj uščuvanosti korteksa: vrlo dobar.
Spol: muškarac.
Starost u trenutku smrti: 35 do 40 godina.
Patološke promjene: na distalnim trećinama desne lakatne i palčane kosti prisutno je blago zadebljanje kosti koje je moguće posljedica dobro zarasle frakture ili infrakcije. Blagi degenerativni OA prisutan je na koljenima, dva prsna i jednom slabinskom kralješku. Schmorlovi defekti prisutni su na tri prsna i četiri slabinska kralješka. Blagi zarasli periostitis prisutan je na lijevoj goljeničnoj kosti i lisnim kostima. Na distalnim goljeničnim kostima prisutne su *squatting facets*. Na zubima su prisutni hipoplastični defekti.
Asocirani materijalni ostaci ili životinjske kosti: životinjske kosti.
Procijenjena prosječna tjelesna visina osobe: 173,6±3,72 cm.

Grob 10

Stupanj uščuvanosti korteksa: odličan.
Spol: muškarac.
Starost u trenutku smrti: 35 do 40 godina.
Patološke promjene: blago izražena *fossa rhomboidea* prisutna je na desnoj ključnoj kosti. Benigni kortikalni defekti prisutni su na hvatištima mišića *pectoralis* i *teres maior* obje nadlaktične kosti. Schmorlovi defekti prisutni su na dva prsna i jednom slabinskom kralješku. Blagi degenerativni OA prisutan je na jednom prsnom i jednom slabinskom kralješku. Blagi aktivni periostitis prisutan je na goljeničnim kostima, a zarasli na goljeničnim kostima i lijevoj lisnoj kosti. Na zubima su prisutni hipoplastični defekti.
Asocirani materijalni ostaci ili životinjske kosti: nisu prisutni.
Procijenjena prosječna tjelesna visina osobe: 177,3±3,08 cm.

Grob 11

Stupanj uščuvanosti korteksa: odličan.
Spol: dijete.
Starost u trenutku smrti: 2 do 3 godine.
Patološke promjene: nisu prisutne.
Asocirani materijalni ostaci ili životinjske kosti: nisu prisutni.

Grave no. 7

Condition of cortex: Very good.
Sex: Male.
Age at death: 35 to 40 years.
Pathological changes: A slight bone thickening – possibly a result of a well-healed fracture or infraction – can be seen on the distal thirds of the right ulna and radius. Mild degenerative OA on knees, two thoracic vertebrae and one lumbar vertebra. Schmorl's nodes on three thoracic and four lumbar vertebrae. Mild healed periostitis on left tibia and fibulae. *Squatting facets* visible on the distal tibiae. Hypoplastic defects can be seen on the teeth.
Associated material remains or animal bones: Animal bones.
Estimated average body height: 173.6±3.72cm.

Grave no. 10

Condition of cortex: Excellent.
Sex: Male.
Age at death: 35 to 40 years.
Pathological changes: Slight *rhomboid fossa* on right clavicle. Benign cortical defects on points of attachment of *pectoralis* and *teres maior* on both humeri. Schmorl's nodes on two thoracic vertebrae and one lumbar vertebra. Mild degenerative OA on one thoracic and one lumbar vertebra. Mild active periostitis on tibiae and healed periostitis on tibiae and on left fibula. Hypoplastic defects can be seen on the teeth.
Associated material remains or animal bones: None.
Estimated average body height: 177.3±3.08cm.
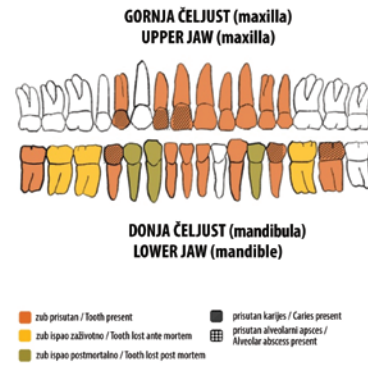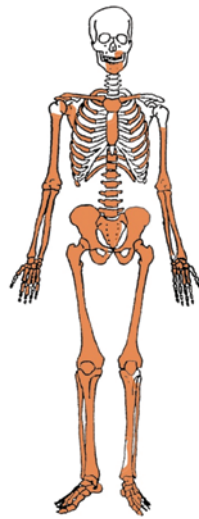
Grave no. 11

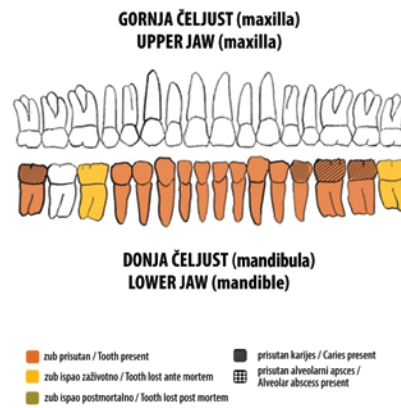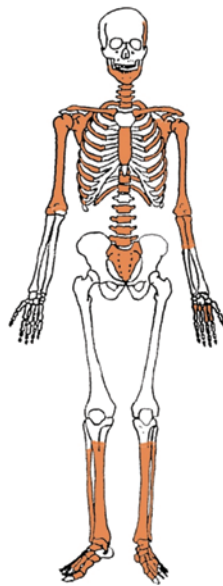***Condition of cortex:*** Excellent.
Sex: Subadult.
Age at death: 2 to 3 years.
Pathological changes: Not found.
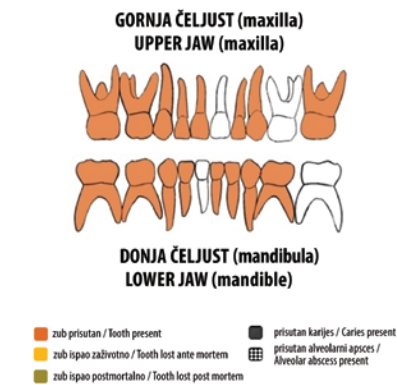***Associated material remains or animal bones:*** None.

GORNJA ČELJUST (maxilla)
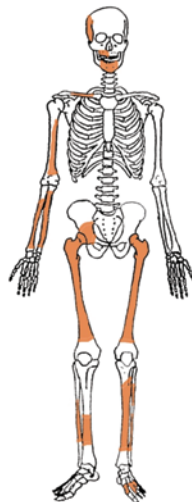**UPPER JAW (maxilla)**

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces /
Alveolar abscess present

GROB / GRAVE 7

GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces /
Alveolar abscess present

GROB / GRAVE 10

GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

zub prisutan / Tooth present
zub ispao zaživotno / Tooth lost ante mortem
zub ispao postmortalno / Tooth lost post mortem

prisutan karijes / Caries present
prisutan alveolarni apsces /
Alveolar abscess present

GROB / GRAVE 11

Grob 13

Osoba A
Stupanj uščuvanosti korteksa: vrlo dobar.
Spol: dijete.
Starost u trenutku smrti: 2 do 2,5 godine.
Patološke promjene: blaga zarasla *CO* prisutna je u lijevoj orbiti. Blagi aktivni periostitis prisutan je na lijevoj sljepoočnoj kosti, donjoj čeljusti, lijevoj goljeničnoj kosti i obje lisne kosti.
Asocirani materijalni ostaci ili životinjske kosti: životinjske kosti, spaljena kost lubanje i nagoreni metal(?).

Grob 13

Osoba B
Stupanj uščuvanosti korteksa: odličan.
Spol: dijete.
Starost u trenutku smrti: 1 do 1,5 godina.
Patološke promjene: blaga aktivna *CO* prisutna je u desnoj orbiti. Blagi aktivni periostitis prisutan je na unutarnjoj strani lubanje, desnoj sljepoočnoj kosti te goljeničnim kostima.

Grave no. 13

Individual A
Condition of cortex: Very good.
Sex: Subadult.
Age at death: 2 to 2.5 years.
Pathological changes: Mild healed *CO* in left eye orbit. Mild active periostitis on left temporal bone, mandible, left tibia and both fibulae.
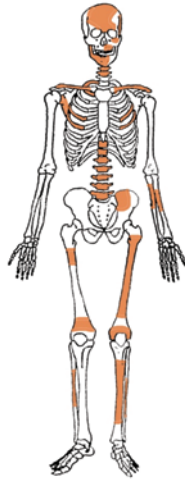*Associated material remains or animal bones:* Animal bones, burnt skull bone and partly burnt metal (?).

Grave no. 13
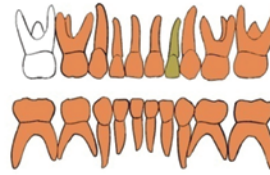
Individual B
Condition of cortex: Excellent.
Sex: Subadult.
Age at death: 1 to 1.5 years.
Pathological changes: Mild active *CO* in right eye orbit. Mild active periostitis on inner side of skull, right temporal bone and tibiae.
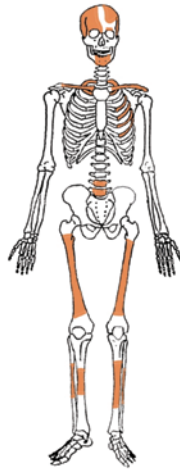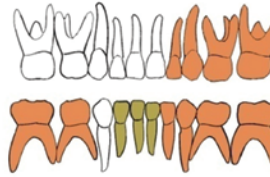
GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

- ■ zub prisutan / Tooth present
- ■ zub ispao zaživotno / Tooth lost ante mortem
- ■ zub ispao postmortalno / Tooth lost post mortem
- ■ prisutan karijes / Caries present
- ⊞ prisutan alveolarni apsces / Alveolar abscess present

GROB / GRAVE 13 OSOBA / PARSON A

GORNJA ČELJUST (maxilla)
UPPER JAW (maxilla)

DONJA ČELJUST (mandibula)
LOWER JAW (mandible)

- ■ zub prisutan / Tooth present
- ■ zub ispao zaživotno / Tooth lost ante mortem
- ■ zub ispao postmortalno / Tooth lost post mortem
- ■ prisutan karijes / Caries present
- ⊞ prisutan alveolarni apsces / Alveolar abscess present

GROB / GRAVE 13 OSOBA / PARSON B

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