Volume 15
2025

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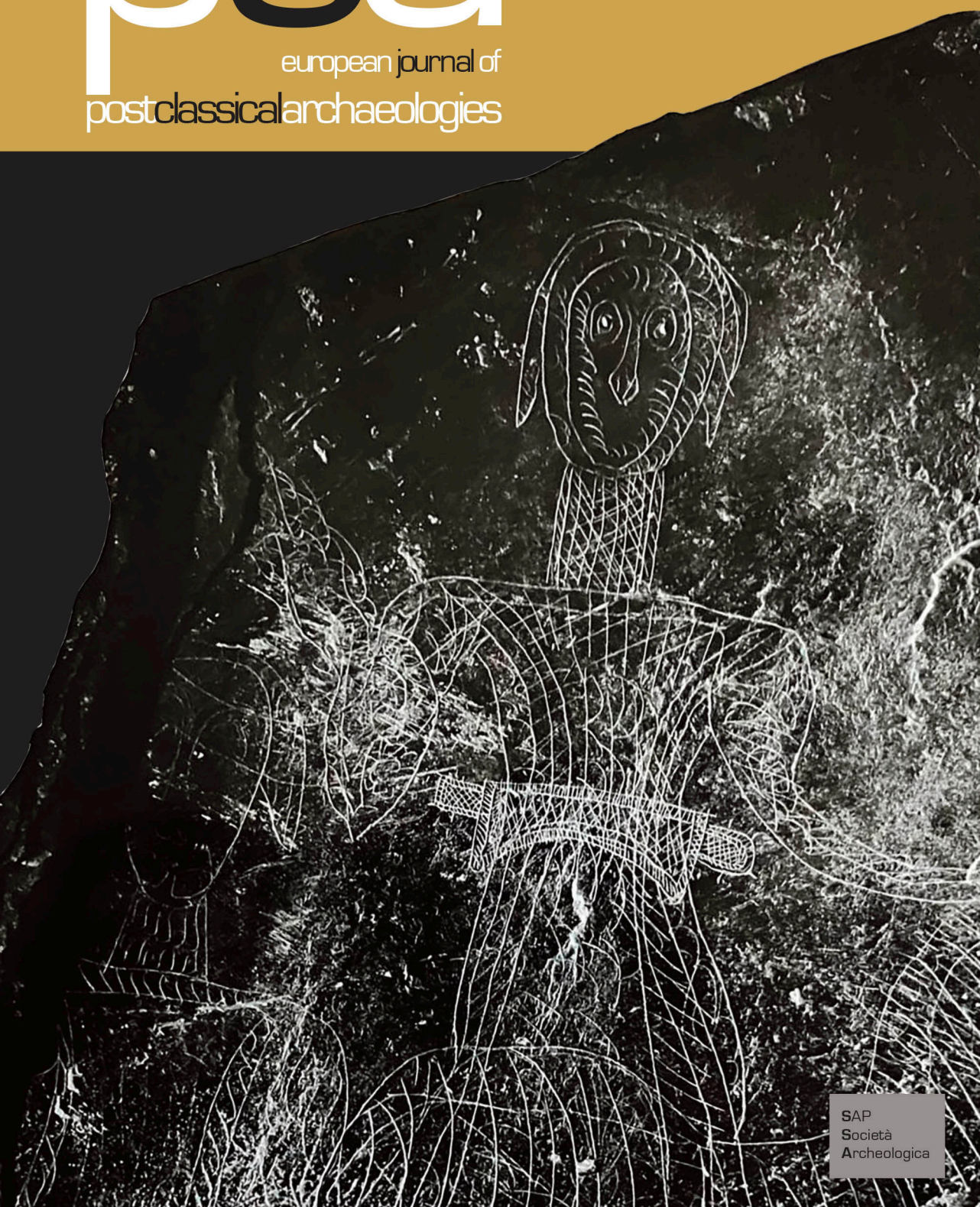

SAP
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european journal of
postclassicalarchaeologies

volume 15/2025

SAP Società Archeologica s.r.l.

Mantova 2025

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Cover image: San Vicente del Río Almar (Alconaba, Salamanca), slate decorated with drawings (see p. 189).

"Post-Classical Archaeologies" is indexed in Scopus and classified as Q3 by the Scimago Journal Rank (2022). It was approved on 2015-05-13 according to ERIH PLUS criteria for inclusion and indexed in Carhus+2018. Classified A by ANVUR (Agenzia Nazionale di Valutazione del sistema Universitario e della Ricerca).

DESIGN:
Paolo Vedovetto

PUBLISHER:
SAP Società Archeologica s.r.l.
Strada Fienili 39/a, 46020 Quingentole, Mantua, Italy
www.saplibri.it

Authorised by Mantua court no. 4/2011 of April 8, 2011

For subscription and all other information visit the website www.postclassical.it.

Volume funded by the
University of Padova
Department of Cultural Heritage

dBC DIPARTIMENTO DEI BENI CULTURALI ARCHEOLOGIA, STORIA DELL'ARTE, DEL CINEMA E DELLA MUSICA

ISSN 2039-7895

pca
european journal of
postclassicalarchaeologies

volume 15/2025

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Ksenija Đukić*, Veda Mikasinovic*

Did females and children suffer more in 6th-century Europe? Bioarchaeological insights from the Čik necropolis (Northern Serbia)

1. Introduction

During the transition from Antiquity to the Middle Ages, Central European populations came under the authority of several powerful political entities (Pohl 2018). Among these, the Avar Khaganate stands out as one of the most formidable and militarised steppe confederations (Kovačević 2014). Originating from the Central Asian steppes, the Avars entered Europe in the second half of the 6th century and established dominance over large parts of Central and Eastern Europe, maintaining their influence from the late 6th to the early 9th century (Pohl 2018). The Khaganate represented a distinctive form of statehood characterised by a cultural synthesis and biological symbiosis between the Avars, local populations, and newly arrived groups, all under the authority of the Khagan and his elite circle of professional warriors (Kovačević 2014). While traditionally described as a nomadic society, the Avars gradually settled within the Carpathian Basin, a process marked by recurring warfare and political volatility (Pohl 2018).

The broader European context of the 6th century CE was itself highly transformative, shaped by political fragmentation, continuous military conflict, epidemic diseases, and significant climatic fluctuations. Warfare and political turmoil were persistent features of European history. Still, this period was marked by two particularly disruptive forces: the Justinian Plague and the climatic downturn now known as the Late Antique Little Ice Age (LALIA).

The LALIA represents the coldest interval of the last two millennia (Büntgen *et al.* 2022, pp. 2336-2344). Triggered by a series of major volcanic eruptions around 536 and 540 CE (Büntgen *et al.* 2022, pp. 2336-2344), average temperatures across the Northern Hemisphere fell by approximately one degree Celsius

* Center of Bone Biology, Institute of Anatomy, Faculty of Medicine, University of Belgrade, Belgrade, Serbia. Corresponding author: *ksenija.djukic@bio.bg.ac.rs*.

within a decade (Peregrine 2020, pp. 1-5). Climate scientists, historians, and archaeologists generally agreed that the LALIA triggered widespread social disruption, famine, and episodes of epidemic disease across the Northern Hemisphere (Peregrine 2020, p. 1; Buntgen *et al.* 2016, pp. 231-236). A cross-cultural study provided by Peregrine systematically examining the relationship between LALIA and social upheaval confirmed that its onset marked the beginning of a period of profound social change, demonstrating a statistically significant association between the intensity of climatic cooling and the degree of locally experienced social transformation (Peregrine 2020, pp. 1-5).

Key aspects of social change during the LALIA included the Justinian Plaque (Newfield *et al.* 2018, pp. 91-94) as well as broader patterns of vulnerability and resilience in the face of climatic catastrophe (Peregrine 2020, p. 1). The first historically documented pandemic caused by *Yersinia pestis*, the Justinian Plague, erupted in the mid-6th century CE. Its initial outbreak occurred between 541 and 544 CE, but recurrent waves extended until around 750 CE, collectively described as the First Pandemic (Stathakopoulos 2000, pp. 255-267; Cunha, Cunha 2008, pp. 1-20). Contemporary and later sources mention up to 21 episodes of pestilence attributed to this event (Tsiamis 2011, pp. 36-41). The epidemic, which likely originated in Egypt, spread rapidly across the eastern Roman Empire, neighbouring regions, and much of western Eurasia and North Africa (Cunha, Cunha 2008, pp. 1-20). In this context, assessing vulnerability, including environmental, technological, and socio-political dimensions, has been recognised as crucial to understand social stability and change under climatic stress. The LALIA provides a critical framework for identifying both effective and maladaptive strategies that societies employed to cope with dramatic temperature shifts (Peregrine 2020, pp. 1-5). However, not all regions of the Northern Hemisphere experienced these climatic and social challenges in the same way. While the available sources discuss the broader impact of the LALIA on the Eastern Roman Empire, they do not offer direct analyses of its effects in Southeast Europe, where the archaeological site under this study is located. Consequently, any attempt to evaluate the influence of the LALIA on the territory of modern-day Serbia must necessarily draw upon evidence relating to the Eastern Roman Empire.

Although these phenomena are widely understood to have contributed to demographic decline, famine, diseases, and large-scale social instability (Buntgen *et al.* 2016, pp. 231-236; Peregrine 2020, pp. 1-5; Olshanetsky *et al.* 2024, pp. 721-759), the existing literature does not provide specific analyses of their potentially different impact on females and non-adults, whether in terms of mortality, morbidity, or physiological response. Instead, the available focuses on the broader relationship between climatic stress and population health at a general level. Yet, periods of such environmental and social stress rarely affected all community members equally, making it crucial to consider how different demographic groups may have experienced these crises. Historical and bioanthropo-

logical evidence indicates that females and particularly non-adults often bore the heaviest burdens during crises (Scraton 2006, pp. 28-29; Martin, Tegtmeyer 2017, pp. 1-14). From a bioarchaeological perspective, the study of skeletal remains provides critical insights into how these vulnerable groups experienced and adapted to profound social and ecological disruptions. Health indicators preserved in bones and teeth of past populations can thus shed light on the lived realities of those who endured the upheavals of the 6th century.

In this paper, we focus on bioanthropological and palaeopathological evidence from the Čik necropolis (Vojvodina region, northern Serbia), dated between the 6th and 7th century CE and attributed to the Avar cultural circle. By examining patterns of health and disease, with particular emphasis on females and non-adults, we aim to contribute to a more nuanced understanding of how vulnerable segments of Avar-period communities responded to the extraordinary challenges of this era. Our working hypothesis was that subtle indicators of changes in lifestyle and adaptations to extreme environmental circumstances might be more easily detected if we focus on the most vulnerable segments of the investigated community. The Čik necropolis represents a valuable context for this type of investigation, as it dates to the 6th century CE, a period marked by profound upheavals, while its geographical location within the Northern Hemisphere placed it directly within the sphere of this transformation.

2. Material and methods

2.1. Brief archaeological background

The Čik archaeological site is situated within the modern municipality of the city of Bečej, in the South Bačka District of northern Serbia (fig. 1). Excavations were carried out intermittently between the late 1960s and the early 1970s (Bugarski 2009), revealing a multi-layered settlement with graves dated to the period of Late Antiquity and Early Avar Period. Nevertheless, within Serbian archaeological literature, the site is primarily recognised as a cemetery dating to the 6th-7th centuries CE, with the period of use extending from the arrival of the Avars on this land (567 CE) until approximately 670 CE (Bugarski 2009). This burial horizon is the primary focus of this study. In general, the analysis of the material indicates that the assemblage belongs to the earlier phase of Avar domination. The presence of specific weapons and luxury jewelry, such as pyramidal earrings and swords with R-shaped suspension loops, places the necropolis within the horizon of R-looped swords, composite bows, ring-shaped beads, and pseudo-buckles, which are characteristic features of the earlier phase of Avar presence in the European land (Bugarski 2009). This paper reports the results of bioanthropological analyses of human skeletal remains found at this cemetery.

Fig. 1. Location of the archaeological site of Čik (edited by Veda Mikasinovic).

For our analysis, we selected skeletal remains from the Early Avar horizon (6th-7th centuries CE), comprising a total of 101 individuals.

The necropolis is located in the southern hinterland of the Carpathian Basin, in a region where subsistence activities were most likely based on agriculture and the production of farming implements. The archaeological evidence from Čik confirms that the population had moved away from a strictly nomadic existence early in the Avar period, relying on a mixed economy that included agriculture, organised animal husbandry, and local crafts, while also maintaining warrior elite. However, judging by the available finds, the presence of warriors appears to have been only sporadic. The abundant evidence of agricultural tools and textile production further supports the interpretation that this was primarily a rural, settled community within the Khaganate (Bugarski 2009).

2.2. Bioanthropological and palaeopathological analysis

The bioanthropological and palaeopathological analysis of the investigated population from the site of Čik was conducted in the Centre of Bone Biology, Faculty of Medicine in Belgrade (Serbia). The analyses involved an assessment of the state of preservation of skeletal material, an estimation of biological sex and age at death, reconstruction of average stature, an evaluation of oral health, as well as the identification of pathological lesions.

The overall preservation of skeletal material was carried out according to the recommendations of Mikić (1978, pp. 3-44).

Biological sex, only in adults, was estimated based on differences in morphological features of the skull and pelvis (Buikstra, Ubelaker 1994). Age at death in adults was assessed by analysing the morphological characteristics of the pubic symphysis (Suchey, Brooks 1990, pp. 227-238), the sternal ends of the ribs (Işcan *et al.* 1984, pp. 147-156; Işcan *et al.* 1985, pp. 853-863), and the auricular surface of the ilium (Lovejoy *et al.* 1985, pp. 47-56). Additional assessment of individual age has included analysis of dental status (Brothwell 1981) and the degree of fusion of the cranial sutures (Meindl, Lovejoy 1985, pp. 57-66). In non-adults, age at death was estimated based on the development of tooth crowns and roots (Ubelaker 1984), as well as the maximum length of the long bones of the upper and lower limbs, using a generally accepted methodology proposed by Maresh (1970, pp. 157-200). Based on the estimated age, the analyzed individuals were classified into the following age cohorts: Foetus, Early Childhood 1 (< 1 year), Early Childhood 2 (1-5 years), Childhood (6-11 years), Adolescent (12-17 years), Young Adult (18-25 years), Middle Adult (26-40 years), Mature Adult (41-55 years), Old Adult (>55 years), Adult, and Non-Adult. The reconstruction of stature for adults was calculated based on the maximum length of the long bones (Trotter, Gleser 1958, pp. 79-123).

The palaeopathological analysis was conducted through a gross examination of all preserved skeletal elements, with systematic recording of pathological lesions, including their size, location, and distribution, generally following the recommendations of Buikstra (2019). However, in cases where more reliable confirmation of the pathological condition was needed to establish a precise differential diagnosis, additional radiological imaging was performed, using standard procedures. To assess the pathological profile of the studied skeletal assamblage, particular attention was given to skeletal indicators of early life stress, such as porous cranial lesions (PCLs) - *cribra orbitalia* (CO), porotic hyperostosis (PH), as well as linear enamel hypoplasia (LEH). The analysis of PCLs followed the recommendations of Stuart-Macadam (1985, pp. 391-398) and Mikasinovic *et al.* (2024, pp. 2818-2828), and was limited to cases in which at least one orbit and a cranial bone were preserved. It should be noted that the terminology regarding is inconsistent in the bioanthropological literature, while PH is the most widely applied term (Stuart-Macadam 1985, pp. 391-398; Grauer 2019, pp. 508-518), some authors use *cribra cranii* for related skeletal manifestations (e.g. Henshen 1961, pp. 724-729; Facchini *et al.* 2004, pp. 126-136; Rinaldo *et al.* 2019, pp. 3549-3559). In this study, we adopt the more common terminology, restricting analysis to orbital roof lesions (CO), and cranial vault lesions (PH). Macroscopical assessment of LEH was conducted according to the criteria proposed by Goodman and Rose (1990, pp. 59-110). Metabolic disorders were identified following recommendations of Brickley *et al.* (2020). Moreover, degenerative joint

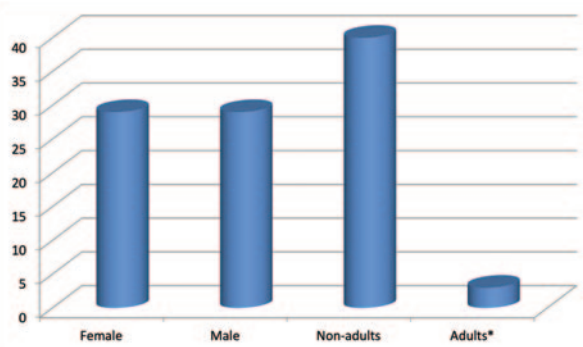

Fig. 2. Distribution of biological sex of individuals analysed in this study (*represents adult individuals whose biological sex cannot be precisely estimated).

disease (osteoarthritis) was examined following Rodgers and Waldron (1995), while trauma patterns were analysed in terms of prevalence and injury mechanism, following (Lovell, Grauer 2018, pp. 335-383).

3. Results

A total of 101 individuals were analysed from the Čik necropolis. Of these, 29 (28.43%) were determined as females, 29 (28.43%) as males, and 40 (39.6%) as non-adults. In three cases (2.97%), the biological sex could not be estimated due to poor preservation (fig. 2). Age-at-death estimation revealed that the most represented group was the Mature Adult cohort (41-55 years), comprising 16 individuals (15.84%), whereas adolescents (12-17 years) were the least numerous, with only three individuals (2.97%). In addition, one foetus was identified (table 1). The mean age at death was calculated as 26.92 ± 19,3 years for adult males, 31.48 ± 23.16 years for adult females, and 4.73 ± 3,65 years for non-adults. It should be emphasised that future genetic analyses may refine these results, particularly in cases where traditional bioanthropological methods were insufficient for biological sex estimation.

Adult stature was reconstructed from maximum long bone lengths. The average female height was 153.3 cm, with the tallest woman interred in grave 112 (160 cm) and the shortest in grave 122 (145 cm). The mean male stature was 163.6 cm, ranging from 151 cm (grave 37) to 171 cm (grave 103).

Palaeopathological changes were recorded in 37% of the analysed population. In the following text, the pathological conditions that were most frequent in the investigated population will be outlined.

Among non-adults, at least one skeletal marker of physiological stress; *cribra orbitalia* (CO), porotic hyperostosis (PH), or linear enamel hypoplasia (LEH), was identified in 19 individuals (47.5%), most frequently in non-adults aged 0-3 years (fig. 3). Evidence of metabolic disorders was also present: five non-adults dis-

Age cohorts	Number	Percentage (%)
Foetus	1	0.99
Early Childhood 1 (<1 yrs)	7	6.93
Early Childhood 2 (1-5 yrs)	14	13.86
Childhood (6-11 yrs)	14	13.86
Adolescent (12-17 yrs)	3	2.97
Young Adult (18-25 yrs)	9	8.91
Middle Adult (26-40 yrs)	11	10.89
Mature Adult (41-55 yrs)	16	15.84
Old Adult (>55 yrs)	15	14.85
Adults*	10	9.9
Non-adults*	1	0.99
Total	101	100

Table 1. Distribution of Age Cohorts at the archaeological site of Čik (*represents individuals whose biological sex cannot be precisely estimated).

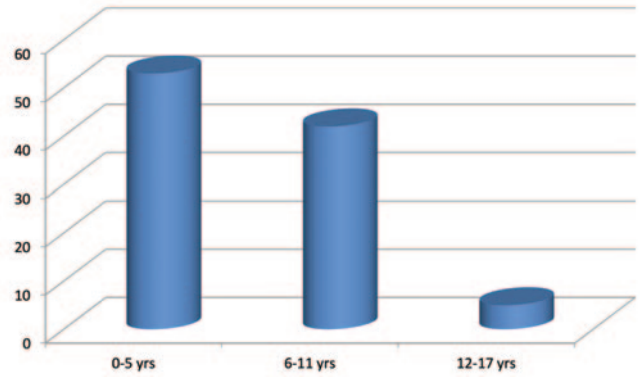

Fig. 3. Distribution of Early Life Stress among non-adults age cohorts.

played signs of scurvy, two showed indications of rickets, and one case was consistent with idiopathic hydrocephalus. For the cases identified as scurvy, the diagnosis was based on the presence of porotic lesions at reference locations on the skeleton (mandible, palate, above the external acoustic meatus, cranial vault, occipital base, etc.) (fig. 4) (Brickley, Mays 2019, pp. 531-539), while for the cases of rickets, the reference features were the curvature of the bones of the lower limbs (Brickley, Mays 2019, pp. 540–552). As no additional differential diagnosis could be provided for the latter beyond macroscopic examination, this case is noted but excluded from further discussion.

Among all paleopathological conditions, osteoarthritis accounted for the largest share (32.3%), with a notably higher frequency in females (fig. 5). These changes were most pronounced in the spine, followed by the knee joints.

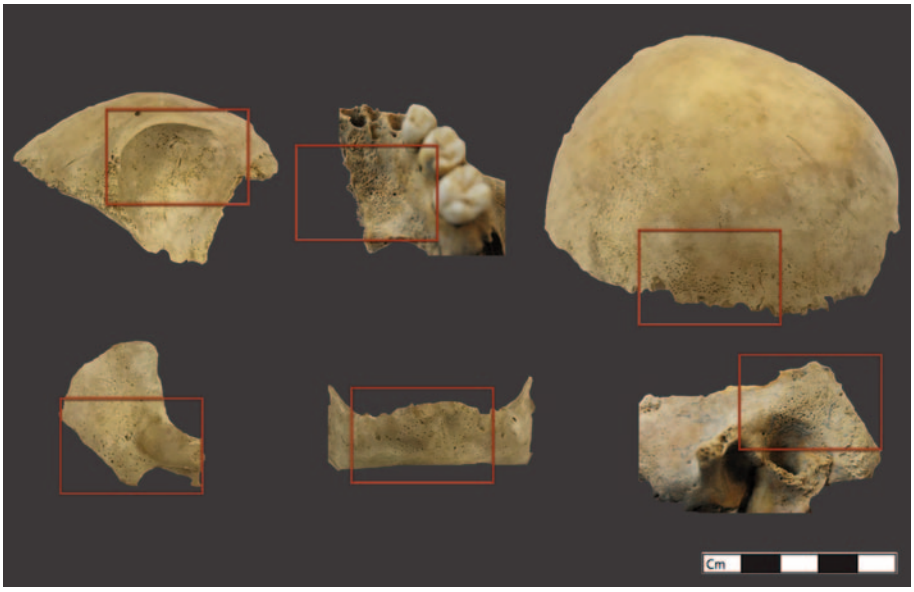

Fig. 4. Skeletal signs of Scurvy in Čik (photos and editing by Veda Mikasinovic).

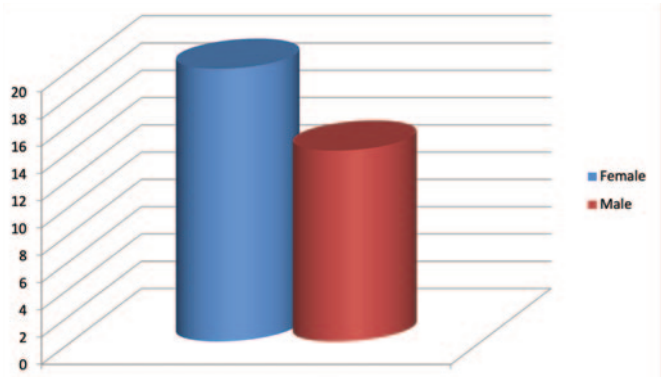

Fig. 5. Percentage of Osteoarthritis by biological sex at Čik.

Trauma represents the second most prevalent pathological condition recorded in the investigated population. Trauma was identified in 15.7% (n = 8) of individuals with pathological alterations. In total, nine traumatic lesions were documented, as one skeleton (grave 71) exhibited two separate injuries. Of all traumas, 20% were localised on the cranium, 70% on the upper limbs, and 10% on the ribs (fig. 6). The analysis of trauma aetiology suggests sex-based differences: in females, all injuries were consistent with interpersonal violence; whereas in males, one case reflected violence and three were more likely accidental in origin.

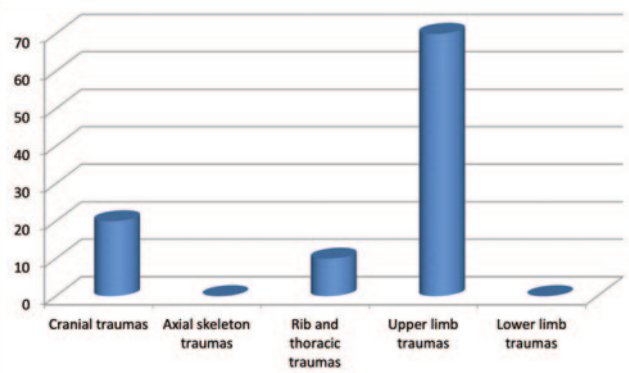

Fig. 6. Percentage of traumas by anatomical regions.

4. Discussion

This study examines bioanthropological and palaeopathological data from the Čik necropolis (northern Serbia), dated between 6th and 7th century CE and associated with the Avar cultural group. By focusing on patterns of health and disease, particularly among females and non-adults, we aim to illuminate how the most vulnerable members of Avar-period communities navigated the complex social and environmental challenges of the time. In the following sections, we will first review the available evidence concerning the lives and social position of females and non-adults within the Avar Khaganate. Subsequently, we will discuss the results of the present study, with particular attention to findings pertaining to females and non-adults.

4.1. Females and non-adults in Avar Khaganate

Evidence regarding the lives of females and non-adults in the Avar Khaganate remains limited, and usually interpreted within the broader framework of the communities' socio-political structure. For instance, genetic studies have provided insights into the life of females and non-adults within the Avar elite community in the Carpathian Basin during the 7th century CE, suggesting that their position within the community were reflected in kinship structure, migratory patterns and differential social visibility (Csáky *et al.* 2020). The genetic analysis of 26 individuals from the Avar elite in the Carpathian Basin during the 7th century CE, including 8 females, indicates that the elite migrated as endogamous family groups rather than solely male military units meaning that females accompanied the males during the conquest and settlement. Maternal lineages were predominantly East Central Asian, suggesting a consciously maintained closed elite for three to four generations. Archaeologically, male burials dominated, while female burials were largely "invisible", with high-status grave goods mainly limited to secondary centres, implying that male

power was expressed publicly, whereas female influence was likely concentrated within the family sphere. Evidence of shared maternal haplotypes further highlights the role of kinship in elite organisation (Csáky *et al.* 2020). The genetic evidence further reveals that children's status was tightly linked to patrilinear inheritance. Juveniles occupied positions determined by paternal kinship, with homogeneous Y-chromosomal lineages highlighting the central role of male lineage in maintaining social hierarchy and transmitting power (Csáky *et al.* 2020). However, the position of females and non-adults in other social strata appears to have been primarily linked to their participation in the economy and subsistence strategies of their communities. Traditional literature suggests that females engaged in a range of economic activities both inside and outside the household, though the precise nature of these tasks remains poorly understood. Domestic activities were largely associated with the daily preparation of food, while females working in the fields were likely involved in labour comparable to that of males, as evidenced by sickles and hoes found in Avar female burials. Archaeological evidence, particularly grave goods, provides the clearest insight into females' activities in textile production, which appears to have been a central aspect of their economic role (Kovačević 2014).

4.2. Females and non-adults in the Čik necropolis

The demographic profile of the Čik necropolis population indicates an almost equal representation of males and females. The relatively high proportion of non-adults (39.6%) is not an unusual finding for cemeteries from this period. However, meaningful comparisons with other sites from the Early Avar period are difficult, as necropolises from this phase are rare in the territory of modern-day Serbia. Research on Avar communities within the territory of present-day Serbia has predominantly concentrated on archaeological evidence, while bioanthropological investigations remain limited, particularly for the Early Avar period. Most bioanthropological studies have focused on the Middle and Late Avar phases, leaving a significant gap in understanding health, disease, and lifestyle for earlier communities. Consequently, reconstructions of these aspects for the Avar period in the region have largely relied on comparative data from Hungary (e.g., Ferencz 1982-1983, pp. 9-41; Szikossy, Bernert 1996, pp. 189-198; Bernert 2003, pp. 225-309; Hajdu 2009, pp. 1-20; Szenicey *et al.* 2013, pp. 59-76; Spekker *et al.* 2022, 2023), supplemented by sporadic contributions from Croatia (Šlaus 1993, pp. 273-307; 1996, pp. 141-149; 2002; 2008, pp. 455-469; Premužić *et al.* 2016, pp. 471-482; 2017, pp. 117-122; Vidal-Ronchas *et al.* 2018, pp. 1727-1737; Carić *et al.* 2019, pp. 161-180) and Serbia itself (Éry 1988, pp. 55-66; Živanović 1962/1963a, pp. 237-239; 1962/1963b, pp. 13-14; 1964, pp. 105-114; Đukić *et al.* 2015, pp. 81-93; Nikolić 2015, pp. 74-94; Đukić, Pavlović 2016, pp. 147-158; Đukić 2017, pp. 23-35; Đukić *et al.* 2018, pp. 656-668). Notably, most of the published bioanthropological studies refer to the later Avar periods.

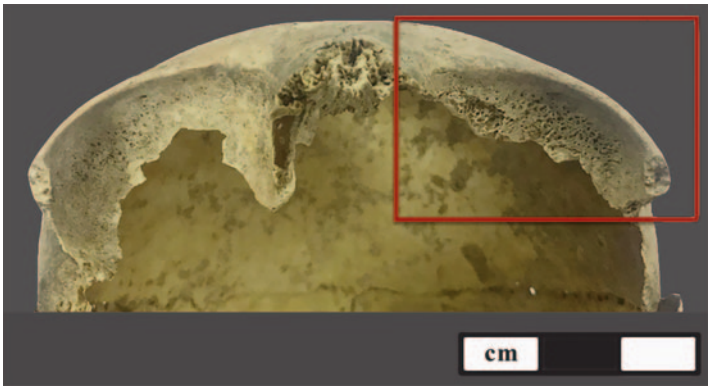

Fig. 7. *Cribra orbitalia* on the left orbital roof (photos and editing by Veda Mikasinovic).

The child mortality pattern observed at the Čik necropolis falls broadly within the expected ranges reported for Avar necropolises, where non-adults typically represent approximately one third of the total population (Molnar, Marcsik 2002, pp. 85-99; Šlaus 2008, pp. 455-469; Hajdu 2009, pp. 1-20; Premužić *et al.* 2017, pp. 117-122; Carić *et al.* 2019, pp. 161-180).

High child mortality, combined with frequent skeletal indicators of early life stress – including CO (fig. 7), PH, and LEH – suggests that non-adults at Čik were exposed to repeated conditions such as: nutritional deficiencies, infectious disease, and other physiological stressors. It is well established in bioanthropological literature that such indicators are most common in non-adults, especially under the age of five, representing the most biologically vulnerable segment of preindustrial societies (Goodman, Armelagos 1989, pp. 225-243). The weaning period, typically occurring around the second year of life, was especially critical: the withdrawal of maternal immunity left non-adults more susceptible to bacterial and parasitic infections, while dietary changes could expose them to deficiencies in vitamins A, C, and D (Lewis 2007). Sporadic evidence of scurvy and rickets in the Čik assemblage further supports the interpretation of multiple metabolic disruptions, pointing to inadequate diet and unfavourable living conditions, such as limited sunlight exposure (Skinner 1986, pp. 59-69), and compromised maternal health (Lewis 2007). However, a comparison of the frequency of skeletal indicators of early life stress with other Avar necropolises suggests that their prevalence in Čik was not particularly high, except in the case of LEH, which reached up to approximately 70% in certain necropolises (Šlaus 1996, pp. 141-149; Premužić *et al.* 2017, pp. 117-122; Carić *et al.* 2019, pp. 161-180; Wiesinger, Kirchengast 2021, pp. 15-25). It is important to note that this comparison was limited to middle- and late Avar period necropolises, as comparable studies from the early Avar period are lacking. Therefore, the observed differences in prevalence may be related to chronological variations between necropolises. Still, they may also reflect potential long-term effects of environmental

frameworks, whose impact on the population might not have been immediately manifested during the period when this climatic event occurred.

Regarding age at death analysis, an interesting observation from the analysed sample is that the mean life expectancy appears slightly higher among females than males, suggesting that females in this community tended to live longer. This pattern may reflect a combination of biological, social and cultural factors influencing mortality, and warrants further consideration when interpreting the overall health and living conditions within the Avar-period population.

Among adult pathologies, degenerative joint disease (osteoarthritis) was the most frequently observed condition, consistent with findings from other Avar populations (Molnar, Marcsik 2002, pp. 85-99; Šlaus 2008, pp. 455-469; Hajdu 2009, pp. 1-20; Nikolić 2015, pp. 74-94; Premužić *et al.* 2017, pp. 117-122; Carić *et al.* 2019, pp. 161-180). Osteoarthritis is well known as one of the most common joint diseases in past populations (Ortner 2003), as well as in modern clinical contexts, where it affects millions worldwide (Courties *et al.* 2024). Modern clinical studies have established that risk factors include age, female sex, obesity, and prior trauma (Courties *et al.* 2024). Since the findings from Čik are in line with other published Avar cemeteries and conform to expectations based on modern medical knowledge, they are not particularly interpretatively sensitive, offering limited additional conclusions.

The second most notable finding concerns trauma. Alongside osteoarthritis and infectious diseases, trauma is among the most frequently reported palaeopathological conditions in skeletal assemblages (Ortner 2003). All traumas documented at Čik were fractures that could have resulted from various events. These were all well-healed antemortem injuries with no evidence of complications. Nevertheless, one aspect deserves particular attention: all female traumas appear consistent with intentional injuries (fig. 8 A, B, and fig. 9). While this does not necessarily imply that females in this community experienced higher levels of violence than males, it raises an intriguing point for future investiga-

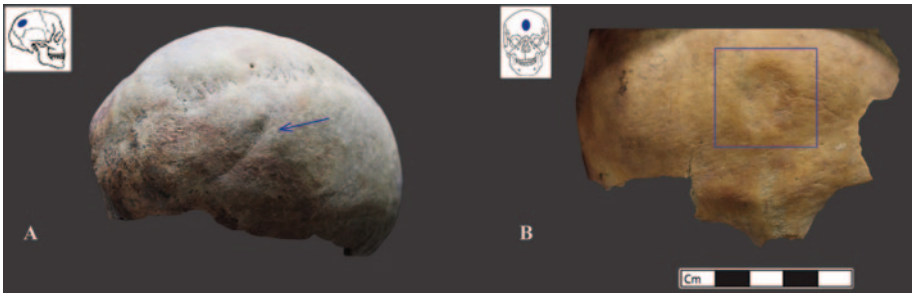

Fig. 8. Traumas on cranium: a) linear sharp trauma of left parietal bone (female, grave 76), b) blunt force trauma of squama of frontal bone (female, grave 32) (photos and editing by Veda Mikasinovic).

Fig. 9. "Button" trauma on the distal shaft of the right ulna (female, grave 46) (photos and editing by Veda Mikasinovic).

tion, as it may reflect underlying social dynamics within the community. However, the final interpretation and conclusions on this matter will be part of a more comprehensive study, as they require a thorough statistical analysis and a focused examination of this issue alone.

5. Conclusion

In this paper, we presented the results of bioanthropological and palaeopathological analyses from the Čik necropolis (Vojvodina region, northern Serbia), dated between the 6th and 7th century CE. Particular attention is given to the health and disease patterns of non-adults and females, as the most vulnerable segments of the communities. Their responses to the extraordinary environmental challenges were likely more severe, and thus more clearly reflected in the overall sample then those of other communities' members. However, our results do not suggest that the investigated population exhibited health or disease patterns indicative of exposure to particularly adverse life conditions. Moreover, our results indicate neither the presence of specific health patterns attributed to the population's living conditions, nor any deviation from the findings of bioanthropological and palaeopathological analyses of skeletal remains from other necropolises dated to similar periods, situated in comparable geographic settings, and attributed to the Avar cultural sphere. Such results could suggest that the investigated population either adapted rapidly and efficiently to the new

living conditions or that the changes in their living environment were not particularly drastic. Nevertheless, some of the changes that occurred may still be reflected, for example, in dietary patterns. To draw firm conclusions, it is therefore necessary to continue research using additional methodological approaches that could potentially reveal shifts in lifestyle. Such further analyses will not only provide a more complete picture of the lives of this population, but may also contribute to a better understanding of this turbulent period in European history.

Acknowledgments

This work was supported by the Science Fund of the Republic of Serbia (grant No. 7394, FirPanGen) and the Ministry of Science of the Republic of Serbia [grant no. 451-03-1524/2023-04/18, 451-03-66/2024-03/200110, and 451-03-136/2025-03/ 200178].

Abstract
The 6th century CE was marked by political instability, pandemics, and climatic fluctuations. Vulnerable groups, especially women and non-adults, were likely disproportionately affected. This study presents bioanthropological and paleopathological analyses of 101 individuals from the Čik necropolis (northern Serbia), focusing on females and non-adults. Of 40 non-adults, 19 showed early life stress indicators, and five had metabolic disorders. Among adults, osteoarthritis, more frequent in women, and trauma were the most common pathologies. Trauma analysis revealed more injuries potentially linked to interpersonal violence among women. Overall, health patterns did not indicate extreme adversity and were consistent with other Avar-associated necropolises.
Keywords: LALIA, Avar(s), osteoarthritis, early life stress, trauma.

Il VI secolo d.C. fu caratterizzato da instabilità politica, pandemie e fluttuazioni climatiche. I gruppi vulnerabili, in particolare le donne e i minori, furono probabilmente colpiti in modo sproporzionato. Questo studio presenta analisi bioantropologiche e paleopatologiche di 101 individui provenienti dalla necropoli di Čik (Serbia settentrionale), concentrandosi sulle donne e sui minori. Dei 40 sub-adulti, 19 mostravano indicatori di stress precoce e cinque presentavano disturbi metabolici. Tra gli adulti, le patologie più comuni erano l'osteoartrite, più frequente nelle donne, e i traumi. L'analisi dei traumi ha rivelato un numero maggiore di lesioni potenzialmente legate alla violenza interpersonale tra le donne. Nel complesso, i modelli di salute non indicavano condizioni di estrema avversità ed erano coerenti con quelli di altre necropoli associate agli Avari.
***Parole chiave**: LALIA, Avari, ostoartrite, stress nei sub-adulti, trauma.*

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