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DATA PAPER

Cranial Age Assessment and Cranial Pathology from the Mesolithic-Neolithic Inhabitants of the Danube Gorges, Serbia

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The data-set described here comprises cranial pathology data and cranial age assessment for 113 individuals from four Mesolithic-Neolithic sites in the Danube Gorges, Serbia. Calibrated radiocarbon dates by archaeological site were included where available. The data were collected after anthropological analysis of this collection. This dataset is available from UCL Discovery in .csv format. The reuse potential of these data is great for paleoepidemiology studies, and for associated time-series analyses in this region and beyond. Furthermore, these data can be used for comparative studies of cranial pathology and aging profiles in other Mesolithic-Neolithic collections.

Keywords: Cranial suture obliteration; cribra orbitalia; porotic hyperostosis; tooth wear; radiocarbon chronology; bioarchaeology; the Danube Gorges; Mesolithic; Neolithic

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(1) Overview

Context

The data provided by this study were collected from human skeletal remains derived from four Mesolithic-Neolithic sites of the Lepenski Vir culture in the Danube Gorges, eastern Serbia (Lepenski Vir, Vlasac, Padina, and Hajdučka Vodenica). In the Danube Gorges that lie between Serbia and Romania, over 30 archaeological sites have been discovered during rescue excavations [1] suggesting the continuity of human occupation in the time span of over 4000 years. Sites are dated to the Mesolithic (9500–6200 cal BC), transitional phase (6200-~5950 cal BC) and the Early Neolithic (after ~5950 cal BC) [2]. Communities which inhabited the Danube Gorges region were semi-sedentary hunter-gatherers. Extended supine inhumations were dominant burial form in the Mesolithic phase of the Lepenski Vir culture. At the same time, seated burials placed in lotus positions, evidence of secondary mortuary rites which also include cremations are reflecting complexity of mortuary rites during this phase [1]. Hybridisation of the Lepenski Vir culture started with Mesolithic-Neolithic transitional phase (6200–~5950 cal BC) when this culture was contemporary with early Neolithic sites in the neighbouring regions [3]. Unique architectural features with trapezoidal floors and exceptional sculptures of stone boulders appeared at the eponymous site of the Lepenski Vir [1]. But, lack of domesticates during this phase suggests an unaltered subsistence pattern [4]. Mortuary rites remain the same characterized by extended supine burials. The period after 5900 cal BC is characterized by major changes in the lifestyle among Lepenski Vir communities, such as changes in mortuary practice and appearance of first domesticated animals (sheep/goat, cattle and pig) [4]. In this final phase crouched/flexed inhumations appeared and trapezoidal buildings were abandoned at the site of Lepenski Vir [4].

In the archaeology of both the Balkans and more globally, the Lepenski Vir culture holds a unique position for the understanding of hunter-gatherer communities and the transition to a production economy.

The dataset provided here is of great importance, mainly for two reasons. First, this osteological dataset is unique for this region. Secondly, the dataset covers a long time span which includes the time of the Neolithic transition.

This transition is seen clearly in the archaeological record as a time of change in the lifestyles of the people of the Danube Gorges. These changes may have had a significant impact on human biology. Hereby, we offer one of the ways to detect those changes. Here we provide data for reconstructing the ageing profiles and health of these individuals and place detected changes within established cultural phases.

Spatial coverage

- Lepenski Vir: +44° 31'/-22° 02' (LV)
- Vlasac: +44° 32'/-22° 03' (VL)
- Padina: +44° 36'/-22° 00' (P)
- Hajdučka Vodenica: +44° 38'/-22° 18' (HV)

Temporal coverage

BC9500-BC5500

For a secure interpretation of the nature and rate of change from the Mesolithic to the Neolithic cranial data in the Danube Gorges, it is important to establish a secure chronological sequence. This question has been troubling researchers since the beginning of excavation of the Danube Gorges sites [1], [5], [6], [7], [8], [9].

These scholars indicate a long duration of the Mesolithic period, from around 9400 to around 7500 Cal BC. The early radiocarbon dates are concentrated in two particular periods that may point to two separate phases of settlement discontinuities within these two millennia. It remains possible that there were many more occupation episodes that these dates do not encompass. The transitional phase most likely starts only around 6200 cal BC and ended by around 5900 cal BC [10], [11], [12], [4]. The final, Early Neolithic phase ended by 5700 Cal BC. After that time the Danube Gorges settlements were abandoned for more than a thousand years [4].

(2) Methods

Steps

We carried out a macroscopic examination on available skulls from the Danube Gorges anthropological collection (n = 113) in order to obtain information on individual age and cranial pathologies. Namely, cranial suture closure, porotic hyperostosis, cribra orbitalia, and tooth wear have been recorded[1] for all available individuals in this collection according to standard anthropological methods.

Degree of suture closure was observed macroscopically for 10 ectrocranial, four palatal and three endocranial locations where it was possible. Names of the locations are listed in corresponding .csv file. The degree of suture closure is recorded according the following stages [13]: blank = unobservable; 0 = open; 1 = minimal closure; 2 = significant closure; 3 = complete obliteration.

We made distinction between porosity occurring only within the orbits of the frontal bone (cribra orbitalia) and hyperostotic changes of the cranial vault. Therefore, intensity and activity of porotic hyperostosis were recorded for the frontal, parietal, and occipital bones. For the intensity of conditions, porotic hyperostosis and cribra orbitalia, and according to the standard scoring system [14], we distinguish between following degrees: blank = unobservable; 0 = no porotic changes; 1 = barely discernible; 2 = true porosity; 3 = porosity with coalescence of foramina; 4 = increased vault thickness. After this pathological condition being identified and coded, its activity was coded according the following degrees: 1 = active at the time of death; 2 = healed at the time of death; 3 = mixture of active and healed at the time of death. It is important to note here, when varying degrees were present on the observed locations, we always coded the most extreme one.

Surface wear in molars was coded according the Scott system [15]. For this study we observed mandibular molars (left side). Following the scoring system, each observed molar occlusal surface is divided into quadrants and the amount of observable enamel is scored on a scale between 1 and 10: 0 = no information available; 1 = wear facets invisible or very small; 2 = wear facets large, but large cusps still present and surface features very evident, pinprick size dentine or dots should be ignored; 3 = any cusp in the quadrant area is rounded , the cusp is becoming obliterated but it is not yet worn flat; 4 = quadrant is worn flat with no dentine exposure yet (presence of a pinprick sized dot is possible); 5 = flat quadrant, with dentine exposure one-fourth of quadrant or less; 6 = more than one-fourth of quadrant area is involved , but there is still much enamel present; 7 = enamel is found on only two sides of the quadrant; 8 = enamel on only one side (usually outer rim) but the enamel is thick to medium on this edge; 9 = enamel is only on one side but very thin – just a strip; 10 = no enamel on any part of quadrant - dentine exposure complete, wear is extended below the cervico-enamel junction into the root.

All the scores are listed in four .csv files and assigned to each individual burial number and site abbreviation (LV = Lepenski Vir; VL = Vlasac; P = Padina; HV = Hajducka Vodenica).

The available radiocarbon dates for the examined individuals listed in the cranial dataset are included on an attached .csv file. These dates were calibrated in OxCal software using the IntCal13 calibration curve [16]. These data include the current reservoir effect offsets [2].

(3) Dataset description

Object name

- 01_The_Danube_Gorges_cranial_sutures_closure (.csv file)
- 02_The_Danube_Gorges_cribra_orbitalia (.csv file)
- 03_The_Danube_Gorges_porotic_hyperostosis (.csv file)
- 04_The_Danube_Gorges_tooth_wear_molars (.csv file)
- 05_The_Danube_Gorges_cranial_chronology (.csv file)

Data type

Primary data and interpretation of data.

Format names and versions

.CSV (Comma delineated) Created using Microsoft Excel

Creation dates
This dataset was created between August 1, 2013 and October 20, 2014.

Dataset Creators
Marija Radović; Stefanović, Sofija, Kevan Edinborough.

Language
English

License
CCO

Repository location
Doi.org/ 10.14324/49.2

Publication date
N/A

(4) Reuse potential

This dataset provides a baseline for future osteological studies in this population. Furthermore, as it involves a whole skeletal collection, it is of great importance for health and nutritional assessment in the Mesolithic-Neolithic population in the Danube Gorges as well as for comparative studies between various prehistoric and historic contexts.

In terms of paleopathology, epidemiology and human health studies this dataset can be used for studies of iron deficiency anemia, hygienic conditions, diets deficiency, and infectious disease in this and other past human populations [17], [18], [19], [20].

The uncalibrated radiocarbon dates from the associated individuals are presented here [2], with the calibrated results using OxCal [16] software and the IntCal 13 calibration curve [21]. These results are calibrated in the attached file; 05_The_Danube_Gorges_cranial_chronology.csv. These data can be reused for more detailed calibration modelling, allowing comparison between individuals and sites as they are excavated and reevaluated, both in this region and elsewhere. The study of the Neolithic transition in the Balkans and neighboring areas will immediately benefit from the availability of all these data.

Note

[1] In the database within the cribra orbitalia sheet, the location of the lesion is given in the first column: R = right orbital roof; L = left orbital roof; R&L = both orbital roofs.

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