Review of human osseal remains from XVI-XVIII centuries cemetery of Zatveretsky Posad (Tver, Russia)

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Abstract

Human osseal remains from the cemetery of Zatveretsky Posad at the historical Russian city of Tver revealed the data on its population in XVI-XVIII centuries. Obtained data generally agreed with the material from other contemporaneous necropoles of the city. Domination of male burials and underrepresentation of younger individuals are accompanied by the signs of poor oral hygiene. Caries has not only often destroyed majority of molars in males and females by the age of 45-50 years, but affected teeth of teenagers and even younger individuals. The heavily developed dental calculus is one of the signs of insufficient oral hygiene in adults. Possible kinship between buried is manifested by similar genetically determined cranial anomalies.

Keywords: Archaeoanthropology; Teeth; Caries; Calculus; Cemetery; Traumas; Pathologies; Plagiocephaly; Diseases; Kinship; Tver

Introduction

A part of XVI-XVIII centuries cemetery has been uncovered on the course of archaeological excavations, carried out by the Tver Research and Restoration Archaeological Center in so called Zatveretsky Posad of Tver in 2007 and 2008 (Figure 1, 2). Tver, which is located north of Moscow, was formerly the capital of powerful medieval state and a model provincial town of Imperial Russia. Once being a rivalry of Moscow in a competition for the supremacy, Tver gradually became a provincial town, regaining in XVIII century its importance as a principal station on the highway from

Moscow to St. Petersburg. Despite the significance of Tver for understanding the history of medieval and later history of Russia, thorough archaeological investigations have flourished here only in a few last decades. The systematic studies of human osseal remain have started even later (3). Present investigation follows earlier ones (4, 6, 7), adding to the knowledge of still poor-known anthropology of medieval and later-times population of Tver.

Figure 1. Map of Russian Federation with Tver region and the city of Tver.

Figure 2. Place of excavations (red arrow) in Zatveretsky Posad on the map of Tver (1900).

Materials and methods

Osseal remains of 63 individuals in a varied state of preservation have been investigated on the course of the research (Table 1). Age, sex and height (when possible) of buried were determined using traditional methods, mentioned elsewhere (4, 6, 7). Special attention was paid to osseal manifestations of traumas, diseases, pathologies and metabolic disturbances. Features possibly related to kinship of buried were also recorded. Although results of the preliminary sorting of skeletons by the time of inhumation are used in this study, the entire and more precise time scale will be presented in a later work.

Table 1. Sex, age and height of individuals, analyzed in this study

№	Sex	Age (years)	Age category	Height (cm)
1	♀	60-65	sen	150±1,5
2	♂	53-57	sen	168±1,5
3	♂	24-26	ad	-
4	♂	36-55	mat	-
5	♀	13-14	inf-2	-
6	♀	50-60	sen	-
7	♂	50-60	sen	-
8	♀	36-55	mat	-
9	♂	36-55	mat	-
10	♂	36-55	mat	-
11	♀	36-55	mat	-
12	♂	58-60	sen	-
13	♂	38-45	mat	-
14	♀	36-55	mat	-
15	♂	36-55	mat	-
16	♀	36-55	mat	-
17	♂	36-55	mat	-
18	♀	36-55	mat	-
19	♂	59-65	sen	-
20	♀	36-55	mat	-
21	♀	45-50	mat	-
22	♂	36-55	mat	-
23	♀	45-55	mat	-
24	♀	36-55	mat	-
25	♀	36-55	mat	-
26	♂	36-55	mat	-
27	♂	36-55	mat	-
28	♂	36-55	mat	-
29	♂	55-60	sen	-
30	♂	36-55	mat	-
31	♂	36-55	mat	-
32	♂	36-55	mat	-

№	Sex	Age (years)	Age category	Height (cm)
33	♀	36-55	mat	-
34	♂	36-55	mat	-
35	♂	36-55	mat	-
36	♀	36-55	mat	-
37	♂	36-55	mat	-
38	♂	36-55	mat	-
39	♂	65-75	sen	-
40	♀	36-55	mat	-
41	♂	36-55	mat	-
42	♀	50-55	mat	163,3±0,5
43	♂	45-50	mat	163,7±0,5
44	♂	60-70	sen	-
45	♀	18-20	ad	-
46	♀	60-65	sen	145,4±0,5
47	♂	45-50	mat	-
48	?	9±9мес.	inf-1	-
49	♂	60-65	sen	176,8±0,5
50	?	2,5±6мес.	inf-1	-
51	♀	45-50	mat	164,3±0,5
52	♀	60-65	sen	152,3±0,5
53	?	8-10	inf-2	-
54	?	4±9мес.	inf-1	-
55	♀	45-50	mat	-
56	♂	50-60	mat	-
57	♀	60-70	sen	-
58	♀	35-39	mat	-
59	♂	24-26	ad	-
60	♂	50-60	mat	-
61	?	1,5-2	inf-1	-
62	♂	11-12	inf-2	-
63	♀	18-35	ad	-

Results and discussion

Human osseal remains, excavated in 2007 and 2008 belonged to Caucasians (33 males, 25 fe-males and 5 children of undetermined sex (Table 1; Diagram). Due to unsatisfactory state of preservation of many skeletons, their individual age was assigned to broad categories: maturus for 36-55 years old individuals and senilis – for those more than 55 years old. Other categories considered in Table 1 and comparative Diagram 2 were infantilis-1 (<7), infantilis-2 (7-14), ju-venilis (15–18) and adultus (19–35). Individuals of maturus category clearly dominates over others. Category senilis holds the second place. This, as well as sex distribution, is quite normal situation for medieval and later-times cemeteries of Tver and Tver region (3-5). There is one deviation from results, described in our previous article on "Cholera Cemetery" of Tver (6). Instead of maturus, younger individuals of the category adultus dominated there. This can be related to the specific feature of the mentioned cemetery, which was once used to bury in-dividuals, who died from cholera. Absence of individuals from the category juvenilis is hard to explain and almost definitely related to the size of the sample. Younger individuals of the cat-egories infantilis-1 and infantilis-2 are present, but almost for sure underrepresented; a common feature for cemeteries with poor preservation of bones (2). Height was determined for only 8 individuals. The average for men is 169,5±0,5 cm, for women – 155,1±0,3 cm. These results can not be used for broader generalizations due to small size of the sample, but may later support an idea of trend to the increasing of the height of Tver citizens by the end of XVIII century (skeletons of this time are better preserved to allow the height determination).

The analysis of dental system shows typical for the time and age alterations. Woman of 60-65 year of age from the burial №1 lost antemortem all the lower molars and had periodontal dis-ease in the area of incisors (Figure 3). Man of 53-57 years of age from the burial №2 also lost antemortem almost all the lower molars (besides M2dex) as well as second left upper and lower premolars. He also shows massive calculus on the labial surfaces of preserved teeth (Figure 4). Man 50-60 year of age from the burial №7 lost antemortem all the teeth from the lower jaw (the upper jaw unfortunately was not preserved), while man of 58-60 years of age from the burial № 12 shows numerous neck and crown caries on M2sin and M3sin (Figure 5). Female of 50-55 years of age from the burial № 42 lost antemortem the majority of teeth (Figure 6). This could be related to misbalance due to the metabolic stresses, which this individual experienced during the childhood, according to hypoplastic lines. Hypoplastic lines as well as calculus were also found in man of 45-50 years of age from the burial №43 (Figure 7A). This individual had asymmetrical distortion of the skull, called plagiocephaly (Figure 7B). This genetically determined anomaly could be a clue tp the kinship between buried. At any case, man of 60-65 years of age from the burial №49 had similarly distorted skull (Figure 7C). He also had hypop-lastic lines, showing metabolic stress, to which this individual was exposed at the age of 4-5 years. Girl of 18-20 years of age from the burial №45 normally lacked M3dex. This is not un-usual state, especially for women, whose jaw arches are usually shorter than those of men (1). This girl also had several wormian bones in sutura sagittalis and sutura lambdoidea (Figure 8). Extremely gracile

women 60-65 years of age from the burial №46 besides antemortem loss of many teeth, shows hypoplastic lines of metabolic stress at ages 3.5 and 5 (Figure 9A). The small body size of woman (145,4±0,5 cm) could itself be a consequence of malnourishment at childhood. Three wormian bones in sutura lambdoidea of this woman (Figure 9B) resemble configuration, earlier found in two individuals from cemeteries of Tver (4). Metabolic stresses at the age of 4 and 5 have been also experienced by man of 45-50 years of age from the burial №47 (Figure 10). Woman from the burial №51 has lost to the age of 45-50 almost all the mo-lars. Unusually muscular, she has one wormian bone at the contact of sut. lambdoidea and sut. sagittalis (Figure 11), the most frequent configuration among Tver citizens of the past (4). Similar configuration shows woman of 60-65 years of age from the burial №52. Frontal and parietal bones of the skull have impressions and holes, which at a first glance could be inter-preted as traumatic ones. However, they were caused postmortem by the roots of tree (Figure 12). Child of 4-5 years of age from burial №54 has caries of the crown of M1sin (Figure 13). Mature women from the burial №55 shows the consequences of poor dental hygiene. She lost most of the molars due to the intensive calculus and related paradontosis (Figure 14A). Inci-sors of women bear three hypoplastic lines, indicating metabolic stresses at the ages of 3, 5 and 6 years (Figure 14B). Wormian bone in the skull of this individual at the junction of sut. lambdoidea and sut. sagittalis is appended by the series of small additional bones (Figure 14C). Once muscular, man of 60-70 years of age from the burial №57 has lost all his teeth long before the death (Figure 15). Man of 24-26 years of age from the burial №59 had the me-tabolic stress at the age of 4-4.5. His M2sin has a small carious cavity near the neck on the ante-rior surface of the mentioned tooth. Left lower premolars of the boy of 11-12 years of age from the burial №62 have almost lost their crowns due to the extensive caries (Figure 16). The frequency of caries and hypoplastic lines in a sample does not significantly vary over the centuries.

Diagram. Distribution of buried by age categories

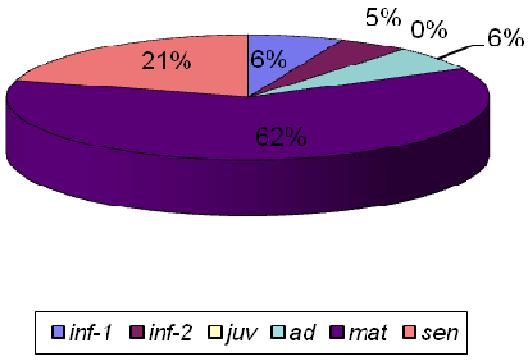

Figure 3. Lower jaw of woman from the burial №1.

Figure 4. Lower jaw of man from the burial №2. Arrow shows especially massive calculus on the lower left canine.

Figure 5. Fragment of the left branch of lower jaw of man from the burial № 12 with caries of M2sin and M3sin.

Figure 6. Lower jaw of female from the burial №42 with antemortem loss of many teeth.

Figure 7. Hypoplastic lines (emphasized by marker) and calculus (white arrow) on the lower teeth (A) and plagiocephalic cranium (B) of man from the burial №43. Compare with plagi-ocephalic cranium of man from burial №49 (C) (white arrow shows abnormally unfused me-topic suture).

Figure 8. Wormian bones (arrows) in sutura sagittalis and sutura lambdoidea of the girl from the burial №45.

Figure 10. Hypoplastic lines (emphasized by marker) on mandibular teeth of man from burial №47.

Figure 9. Lower jaw (A) (hypoplastic lines are emphasized by marker) and cranium with wormian bones (B) (arrows) of woman from the burial №46.

Figure 11. Wormian bone (show by arrow) at the junction of sut. lambdoidea and sut. sagitta-lis in the cranium of woman from the burial №51.

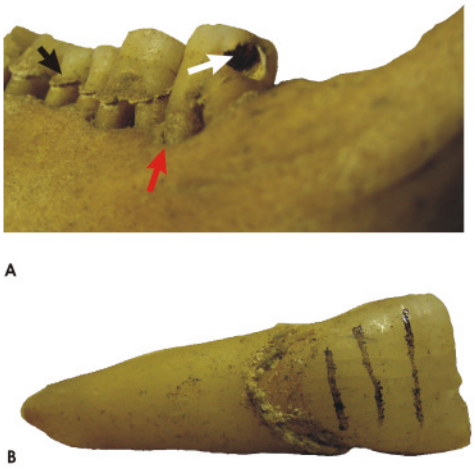

Figure 12. Traces of tree roots – impressions (black arrows) and the hole (white arrow) on the cranium of women from the burial №52.

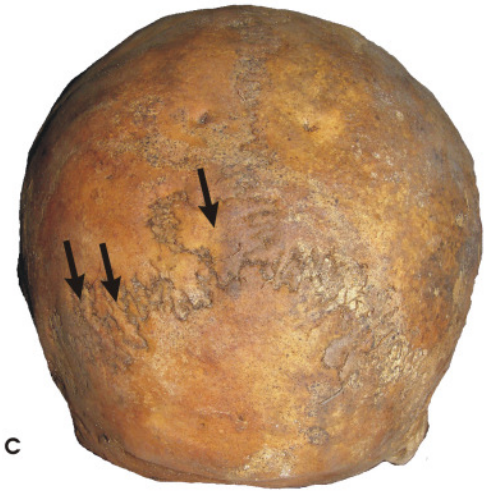

Figure 14. Caries (white arrow), calculus (black arrow) and traces of paradontosis (red arrow) on the lower jaw of women from the burial №55 (A). She experienced three metabolic stresses at the ages of 3, 5 and 6 years according to hypoplastic lines (emphasized by marker) on the incisor (B) and had several wormian bones (black arrows) at the junction of sut. lambdoidea and sut. sagittalis (C).

Figure 13. Caries of M1sin (arrow) in a child from the burial №54.

Figure 15. Fragments of upper and lower jaws of man from the burial №57, showing antemor-tem loss of all the teeth.

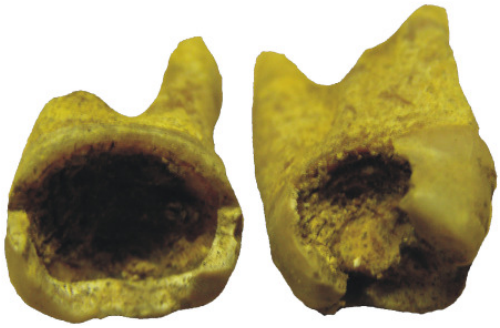

Figure 16. Left lower premolars with caries of 11-12 years of age boy from the burial №62.

Conclusion

Data on human osseal remains from XVI-XVIII cemetery of Zatveretsky Posad generally matches that of the contemporaneous necropoles of Tver. The higher number of male burials, underrepresentation of younger individuals, especially those of infantilis-1 and infantilis-2 cat-egories are accompanied by the signs of poor oral hygiene. Caries has not only destroyed ma-jority of molars in males and females by the age of 45-50 years, but affected teenagers and even younger individuals. The heavily developed dental calculus is one of the signs of insufficient oral hygiene. Possible kinship between buried is generally manifested by similar cranial features.

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