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COMPARATIVE ANTHROPOLOGICAL ANALYSIS OF NON-HUNGARIAN SKELETAL POPULATIONS FROM THE 16–17TH CENTURIES

SUMMARY OF THE PHD THESIS

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Introduction

It is well known from historical sources that in the Ottoman Era a large number of Southern Slavs settled down mainly in the southern parts of that-time Hungary. However, archaeological research has neglected or not recognized the legacy of the Balkan populations during the Turkish occupation for a long time. Archeological relics form the 16th and 17th centuries are hardly known, although almost every museum has findings originating from this period. The modern archaeological research of Balkan populations of the occupation era began in the 1980's; however, it only gained true momentum at the beginning of the 2000's under the leadership of Erika Wicker (Gaál, 1982; Wicker, 2008). This is the reason why comparative anthropological examination of immigrant populations of this period was first conducted only recently. The research carried out by the Department of Biological Anthropology of the University of Szeged since 2003 plays a significant role in this process. Seven of anthropological series have been examined within this project (Molnár et al., 2008). This current work, as part of the mentioned research, presents and compares two of the largest anthropological series from the territory of Bácska Region (Southern Great Plain) during the Ottoman Era.

Aims

One of the most significant questions in the examination of Southern Slavic peoples of the 16th-17th centuries is whether it is possible to determine the exact ethnicity of the immigrant population. In order to achieve this I have tried to answer to the following questions:

- Is it possible to differentiate between the immigrant and resident populations based on the metrical traits of skulls – archeological findings from cemeteries believed to belong to the Hungarian ethnic group from similar and earlier periods?
- Do they show any similarities to data form Southern Slavic and Romanian territories? Is it possible to determine their origin?

The other, larger research objective focused on the lifestyle of the examined

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populations. More specifically, the investigation was supposed to answer to the following question:

- Are there any similarities in the lifestyles and health conditions of the two largest populations of Bácska Region, who belonged to the same culture from the archaeological point of view?

Materials and methods

A major criterion in the selection of the material for the dissertation was that cemeteries should be the appropriate size from statistical point of view; and should also be uniform, based on their archeological findings. These criteria were satisfied by the finding assemblages of Bácsalmás-Óalmás and Zombor-Repülőtér (Zombor-Repülőtér).

Skeletal remains of 481 individuals were excavated from a cemetery in the territory of a sand-mine in Bácsalmás-Óalmás in several excavation seasons between 1993 and 2003 (Wicker, 2008). The majority of the remains were extremely well preserved. The ratio of subadults and adults in the series is 51.5%:48.6%. The male and female ratio – including the remains of sexed individuals from the juvenile population – is 52.7%:47.3%. Characteristic cranial traits are short-medium length, wide, high, hyperbrachykran-brachykran skull and medium wide, medium high visceral cranium. Their stature is large-medium-large.

The excavation of Zombor-Repülőtér cemetery in the airport lot of Zombor (Serbia) took place during the World War 2 (Bartucz, 1960; Korek, 1994). Skeletal remains of 196 individuals were discovered in mostly moderate state of preservation. The ratio of subadults and adults in the series is 33.7%:66.3%. The male and female ratio including sexed individuals from the juvenile population is 47%:53%. Characteristic cranial traits are medium long, wide, high-medium high hyperbrachykran-brachykran skull and wide-medium wide, medium high visceral cranium. Man height is tall in both sexes.

For the purpose of clarifying the ethnic makeup of both cemeteries under scrutiny, I have used data of cemeteries of foreign ethnic groups that were already investigated by the research team of the Department of Biological Anthropology in

Szeged. I have supplemented this material with data of cemeteries of foreign ethnic groups from scholarly literature. As comparative material I have used the Hungarian cemeteries from the Árpád Age and Late Middle Ages, and also Southern Slavic and Romanian cemeteries from the medieval period. To map the connections I have applied systematic cluster analysis: after calculating several biological distance values (Euclidean, maximum, Manhattan and Penrose) from the metric data, I have constructed groups using a combination of hierarchical and non-hierarchical cluster analysis (Ward's, K-mean). To map the actual connections I have only accepted those groupings as real that occurred in the analyses tendentiously (Fóthi and Fóthi, 1990, 1992). Since the majority of the literature from the Balkan only published parameters for males, I performed the analyses with the data of the male population.

Observation of pathological bone changes was very important during the biological reconstruction of the assemblages from Bácsalmás-Óalmás and Zombor-Repülőtér, since these investigations can help to determine and compare health and living conditions of the examined populations. I have studied the pathological changes grouped together based on nosological aspects, basically with macroscopic morphological methods (e.g. Steinbock, 1976; Endes, 1983; Aufderheide and Rodríguez-Martín, 1998; Ortner, 2003). In several cases I have applied the following additional methods to verify the diagnosis: radiographic analyses, paleohistological studies, molecular biological studies (paleoproteomic and paleomicrobial studies) (Schultz, 2001; Lovász et al., 2007, 2013; Boros-Major et al., 2011; Pálfi et al., 2012; Pósa et al., 2012, 2015). To compare frequencies of the various diseases I have used $\chi 2$ test, considering the various state of preservation in the series.

Results

According to the results of distance calculation, the following conclusions can be made:

- All remains of the immigrant males from the time of the Turkish occupation in the territory of Hungary tendentiously belong to one group.

- Based on male skull measurements, these seven series of foreign origin display

close connection with each other and strongly differ from the Hungarian findings of the Árpád Age and the Late Middle Ages. In case of five additional Hungarian series that show relationship with the cemeteries of the immigrants, earlier anthropological examinations have already indicated the possibility of foreign connections.

- As for the origins of the examined populations, the foreign parallels clearly point out a connection to the territory of the Balkan, more specifically to the area populated by the Vlachs.

The presumed common origin is thus verified with biological methods and on the basis of burial customs and grave goods as well (Lovász, 2011). Further presumed Serbian and Macedonian parallels, primarily based on archeological findings, cannot be verified due to absence of comparative material.

Regarding the results of the paleopathological investigations, the following can be stated:

- Health indicators such as infections and the frequency of porotic hyperostosis imply very poor health condition in the population of both cemeteries in comparison to series from earlier periods within Hungary and the Balkan. Comparison of the frequency of non-specific and specific infections with data of other series from the late medieval Hungary and Balkan indicates a very bad state of health in the Bácsalmás population (Lovász et al., 2005, 2007, 2012; Boros-Major et al., 2011; Neparáczki et al., 2011; Pálfi et al., 2012; Pósa et al., 2012, 2015), while an average state in Zombor (Lovász, 2010; Lovász et al., 2010). The difference between the two series is mainly due to the extremely high frequency of changes indicating infection among subadults and adults of the Bácsalmás population, while the adults are less affected in the population from Zombor. Together with other indicators for nutrition and activity these signs refer to difference in living conditions and/or a different infecting agent behind the pathological symptoms. The latter is substantiated by the significantly different frequency of tb cases and different distribution of changes indicating

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tuberculosis in the examined series.

- The frequency of activity indicators such as traumas, or degenerative joint diseases suggests a significantly different way of living in the two groups of people. Even juvenile members of the Bácsalmás population must have performed hard physical labor, presumably animal husbandry or agriculture as implied by historical sources (Lovász et al., 2005). In the Zombor population much less degenerative joint diseases were observed and also the frequencies of the age groups and sexes differ from the data of Bácsalmás – this indicate different types of work both for men and women. The higher frequency of trauma in the population of Zombor suggests more combat-related tasks for males in the population. The proximity of the Zombor fortress and it's military status substantiate this presumption (Hegyi, 2007).

- The difference in the way of life most likely had no influence on eating habits. Their indicators (frequency of porotic hyperostosis, scurvy, osteoporosis and DISH) show similarity in the two groups. The occurrence of the studied diseases verifies the presumption made on the basis of the quantity and nature of archeological findings that in both populations the poor were predominant (Lovász et al., 2005, 2012, 2013).

- Moreover, there is also no difference in the frequency of the lesions caused by vitamin D deficiency. The relatively low values indicate that these populations must have been exposed to satisfactory amount of sunshine, people presumably wore loose clothing and even if they had adopted Muslim clothing habits, the head wear of the women must have been a veil which allowed more light to pass through, and most likely they did not cover their faces with it.

- There is also no difference in the frequency of developmental anomalies: the lesions affect a large portion of members of both groups, which may indicate endogamy. The occurrence pattern of the different anomalies, however, shows that there was no direct genetic relationship between the two communities.

Discussion

The demonstration of biological heterogeneity of the immigrants and the Árpád Age-Late Middle Ages Hungarian series and the successful verification of the Balkan origin is a milestone in the research of foreign ethnic groups that settled down in the Carpathian Basin during the Ottoman Era. Another significant achievement has been to point out the dissimilarity of health conditions and lifestyle among the immigrant population through examination of pathological changes. In addition, the material from both the Bácsalmás and the Zombor cemeteries belong to the first series to have undergone examination of early-stage/atypical lesions of tuberculosis. On one hand, these results indicate a much higher prevalence of tuberculosis infection in that period, than it is shown by the frequency of classic lesions. On the other hand, they also demonstrate how much manifestations of the disease in individual series can differ.

The examination of cemeteries of immigrant groups from the Ottoman Era has a number of additional research potentials as well. Firstly, the examination of newly discovered cemeteries may contribute to the mapping of connections between these groups as written sources report the newcomers were often moving within the territory under Turkish occupation, or to regions that remained under Hungarian rule (e.g. Serbs in Győr, Wicker, 2008). The craniometrical data from medieval cemeteries of the Balkan (mainly from Serbia, Macedonia and Montenegro) are rarely occur in the scientific literature. More frequent publication of such data would facilitate precise determination of the origin of the examined series in Hungary and the data of female burials could also become possible. Further examination of pathological changes presented in this paper might hold additional potential. Perhaps, the most important project concerning pathological features has already been started with the analysis of early-stage/atypical tuberculosis lesions supplemented with molecular assays. The extension of molecular testing onto further cemeteries from the period, as well as the spoligotyping and sequencing of the MTB aDNS positive cases could shed light on the origin of the pathogen and also on background of the different manifestations of tuberculosis.

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