ANTHROPOLOGIE • XXXIX/1 • pp. 63–68 • 2001

SOŇA MASNICOVÁ, RADOSLAV BEŇUŠ

THE HEALTH STATUS AND LIFESTYLE OF HISTORIC BRATISLAVA INHABITANTS: I. PILOT STUDY OF LONG BONE LESIONS FROM GOTHIC PART (XVth–XVIIIth CENT. AD) OF THE OSSUARY IN St. JACOB CHAPEL (BRATISLAVA, SLOVAKIA)

ABSTRACT: Long bones lesions of about 500 adult individuals from the Gothic ossuary in St. Jacob Chapel (Bratislava, Slovakia) were studied to determine the health status and lifestyle in historic Bratislava population. The presence of infections, joint lesions, cortical defects, enthesopathies and traumatic lesions was recorded, and prevalence of diseases was calculated. High prevalence of upper limb bones lesions reveals the activities connected with heavy work using arms (e.g. the carrying of heavy loads, agricultural activities, fishing) in the studied population.

KEY WORDS: Palaeopathology – Long bones lesions – Ossuary

INTRODUCTION

Remains of a medieval building, identified as cemetery chapel of St. Jacob, were discovered during the rebuilding of SNP Square in Bratislava in 1993 (*Figure 1*). Archaeological examination, following the discovery in 1994 and 1995, has revealed four construction phases in the building – pre-Romanesque rotunda, Romanesque ossuary, and two phases of Gothic ossuary (Hoššo, Lesák 1995).

In the past, the chapel was located near the medieval town fortification. North of it there was the St. Lawrence church, surrounded by a village of the same name. The chapel and church were demolished in the period of threatening Turkish occupation in about 1529, and only the neighbouring parsonage and cemetery remained. A Romanesque ossuary was build at the place of the destroyed pre-Romanesque rotunda. In the third phase, the upper part of the Romanesque ossuary was rebuilt in Gothic style, yet continuing to be intensively used as an ossuary.

Osseous remains located in the ruins of St. Jacob Chapel were possible to date only by archaeological dating of the two parts of the ossuary building – Romanesque (XIIth–XIVth cent. AD) and Gothic ossuary (XVth–XVIIIth cent. AD – Hoššo, Lesák 1995). The present study analyses long bones of adult individuals from the Gothic ossuary, using anthropological and palaeopathological methods to determine the health status and lifestyle of historic Bratislava inhabitants.

MATERIAL AND METHODS

Considering the amount of long bones and skulls, there were approximately 500 adult individuals deposited in the Gothic ossuary of St. Jacob Chapel.

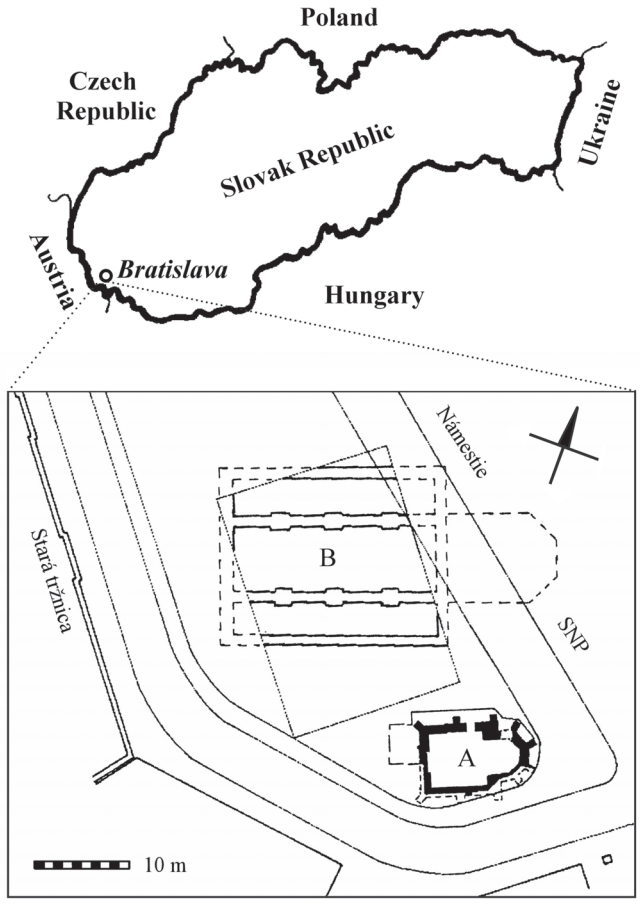

FIGURE 1. The site of St. Jacob Chapel in Bratislava.

Long bones (femora, tibiae, fibulae, humeri, radii and ulnae) were studied using anthropological and palaeopathological methods to determine the presence and prevalence of diseases and activities in the studied population.

The articulations and surface of shafts were macroscopically examined for the presence of inflammations (periostitis), specific infections (syphilis), joint lesions (osteoarthritis, osteochondritis dissecans), cortical defects, enthesopathies and trauma. The stage of osteoarthritis was evaluated by modified method of Schultz (1988), where stage 0–1 of Schultz's scale was scored as non and/or slight OA, 2–3 as medium OA and 4–6 as severe OA in this study.

RESULTS AND DISCUSSION

Infections

Non-specific infections were represented by active periostitis (*Figure 8*), which was present in the highest prevalence at antero-medial tibia (*Figure 2*). The anatomical location exposes the anterior tibia to trauma against which little protection is offered by soft tissue. Subcutaneous and subperiosteal bruises from trauma promote bacterial proliferation through release of blood and intracellular fluids from ruptured cells and vessels (Larsen 1997).

Syphilis

Specific treponemal infections were observed in the studied sample. The cases of tertiary syphilis characterised by periostitis and gummatous destruction of bone occurred in tibiae, with the highest prevalence in tibia dexter (11 cases of 334 in tibia dex. and 7 of 344 in tibia sin.).

Joint lesions

Osteoarthritis (OA)

Articular degenerative pathology, including extensive marginal lipping on weight-bearing and non-weight-bearing joints, eburnations and surface osteophytes (*Figure 12*), were recorded. In the studied sample severe OA was most common in wrists, elbows, right shoulder and hips, and least common in the knee and ankle (*Figure 3*).

Arm OA shows the most pronounced increase in comparison with the other articular joints. The high increase for the arms suggests that this population was engaged in a type or range of activities involving pronounced mechanical stress on the upper limb (e.g. the carrying of heavy loads, agricultural activities, fishing). The state of OA is consistent with everyday activities such as agriculture (especially wine-growing), handicrafts, which are historically documented in historic Bratislava dwellers (Žudel 1984).

Osteochondritis dissecans (OD)

OD is a defect in subchondral bone, formed as the result of fragmentation and probable disruption of articular cartilage, probably consequent upon trauma (Rogers, Waldron 1994). The lesion is variable in size, depth and shape and may be surrounded by a rim of osteophytes (*Figure 13*). OD is quite often referred to in palaeopathological literature. OD can affect any joint, but the most common site is the medial femoral condyle (Rogers, Waldron 1994, Mann, Murphy 1990), which is in consensus with the observations of the present authors (OD 2.02% medial condyle in femur dex. and 4.85% in femur sin.).

Cortical defects

The lesions are linear depressions located at muscle insertion sites on various skeletal elements, especially the

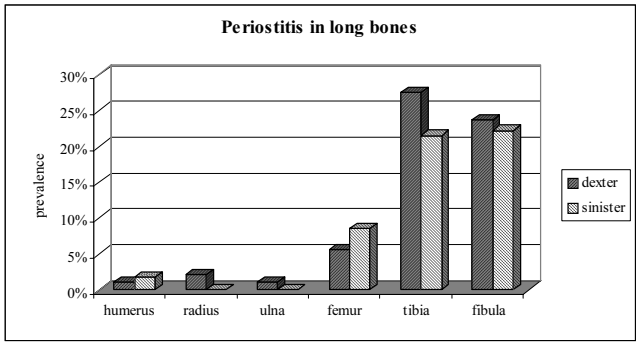

FIGURE 2. Prevalence of periostitis in long bones.

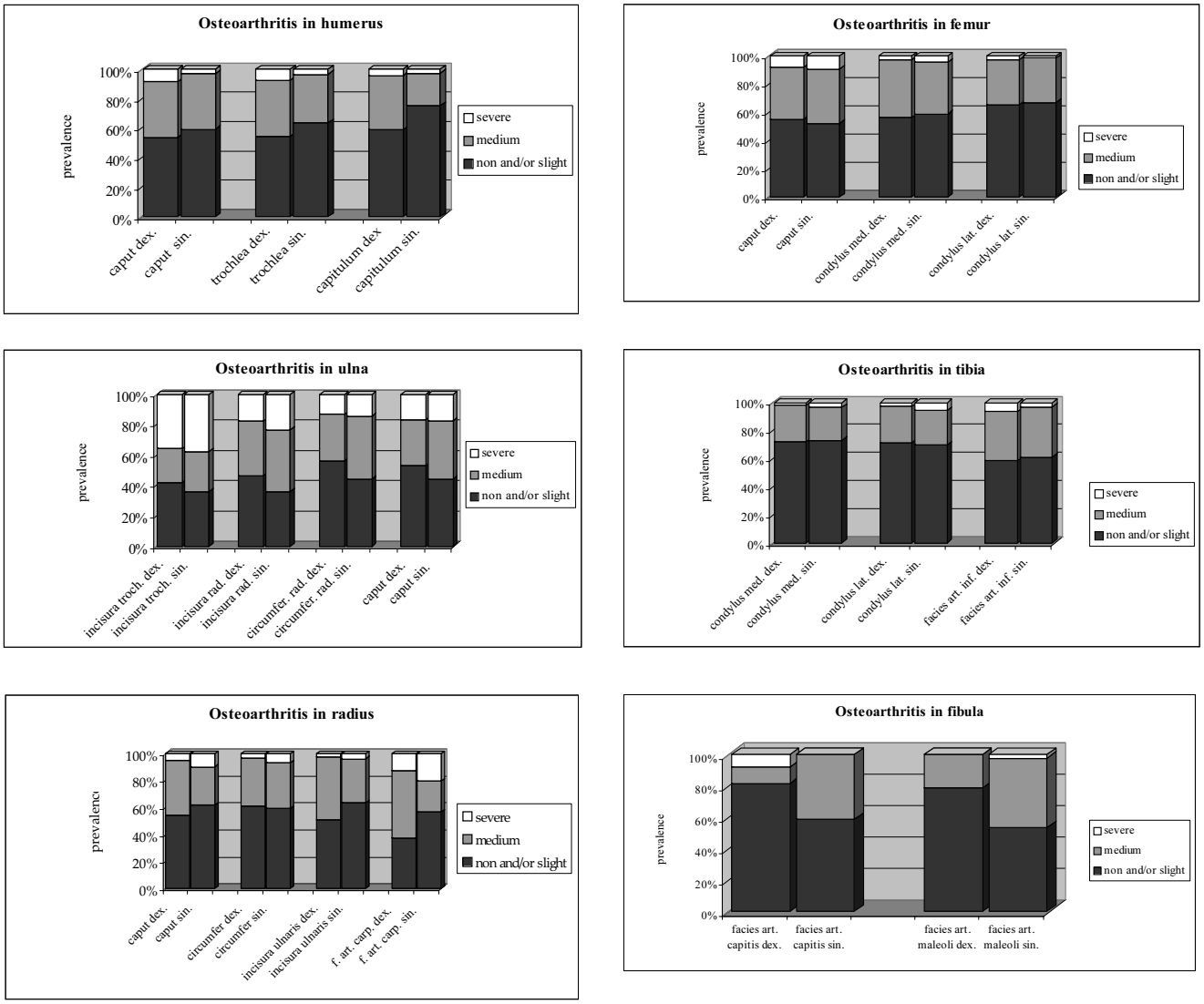

FIGURE 3. Prevalence of OA in articulation surfaces of long bones.

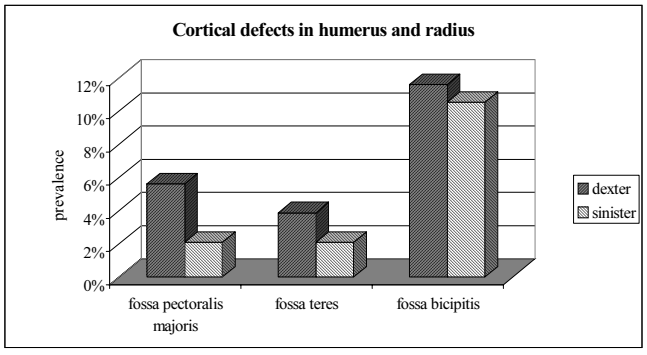

FIGURE 4. Prevalence of cortical defects in humeri and radii.

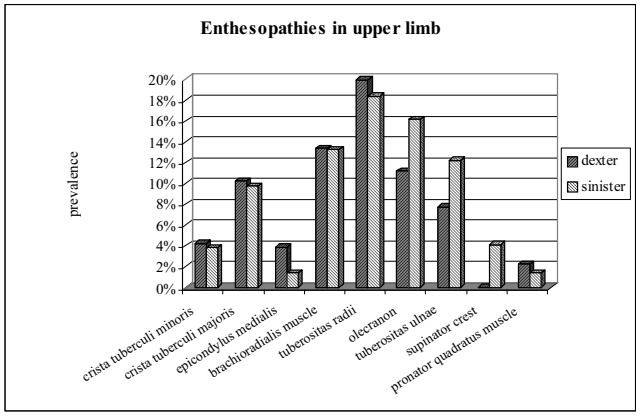

FIGURE 5. Prevalence of enthesopathies in the upper limb bones.

humerus, radius, tibia, femur, metacarpals, metatarsals, and distal phalanges (Owsley *et al.* 1991). The insertion for the *pectoralis major* and *teres major* (proximal humerus) (*Figure 10*), and for the medial head of the *gastrocnemius* (distal femur) are two common locations of cortical defects. The defects are caused by chronic mechanical stress (Owsley *et al.* 1991, Resnick, Greenway 1982). The bilateral asymmetry in the prevalence of cortical defects

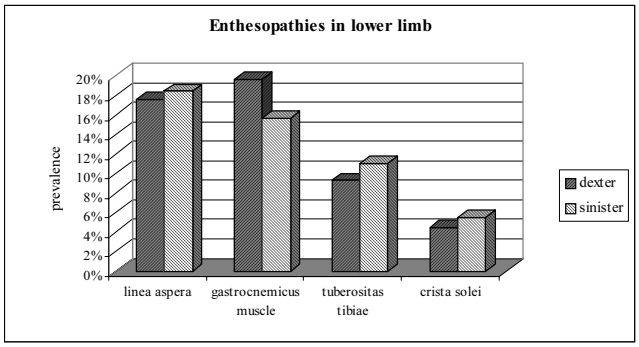

FIGURE 6. Prevalence of enthesopathies in the lower limb bones.

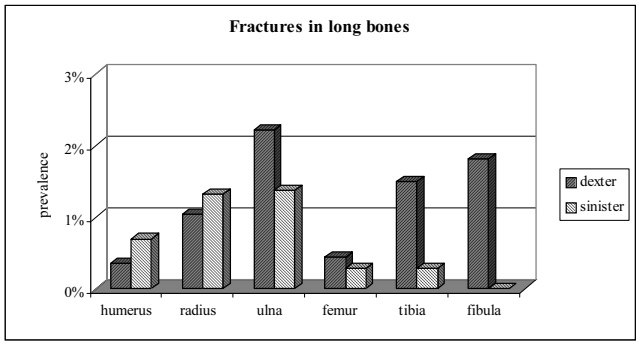

FIGURE 7. Prevalence of fractures in long bones.

FIGURE 8. Periostitis in a left tibia (SvJI/3175).

FIGURE 9. Enthesopathy on the olecranon of a right ulna (SvJI/2818).

in proximal humerus (*fossa teres* and *fossa pectoralis majoris*) and proximal radius (*fossa bicipitis*) reflects right hand dominance in the studied sample (*Figure 4*).

Enthesopathies

Enthesopathic lesions are irregularities, rough patches and bone projections at the insertions of tendons and ligaments (Kennedy 1989). Enthesopathies develop as a result of prolonged and excessive muscular activity. Their location and size in the skeleton give an indication of habitual activities involving specific muscles or groups of muscles (Dutour 1986, Pálfi 1992).

Insertion of brachioradialis muscle, the primary elbow supinator, was the most pronounced among humerus enthesopathies. Exostoses observed with relative high prevalence on the olecranon in the studied sample reflect heavy use of the lower insertion of the tendon for *triceps brachii* (*Figure 9*), the primary elbow extender. Several radii exhibit lesions primarily on the right radial tuberosity, the insertion site for *biceps brachii*, the primary flexor of the elbow. This enthesopathy may be due to the carrying of heavy loads while the elbows are tightly flexed (Dutour 1986). Differences in the prevalence of cortical defects in upper limb bones are draft in *Figure 5*.

In the lower limb bones the enthesopathies were present with the high prevalence on distal femur in gastrocnemicus muscle insertion, active in knee flexion and in *linea aspera*, site of thighs adductors insertion (*Figure 6*).

FIGURE 10. *Fossa pectoralis major* and *fossa pectoralis teres* of a right humerus (SvJI/539).

FIGURE 11. Fracture of a left ulna (SvJI/2634).

FIGURE 12. OA in a right distal humerus (eburnation on *capitulum humeri*, marginal and surface osteophytes on trochlea) (SvJI/3478).

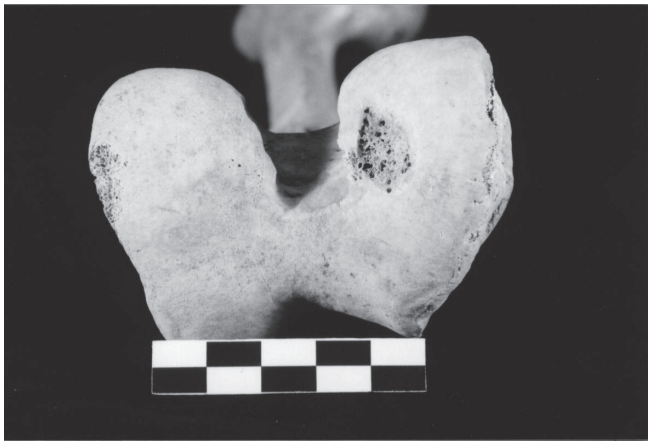

FIGURE 13. OD on the medial condyle of a left femur (SvJI/3215).

Traumatic lesions

Fractures

Many human groups show a high prevalence of forearm (radius, ulna – *Figure 11*) and leg (tibia, fibula) fractures (e.g. Bláha 1963, Ortner, Putschar 1981). Such a trend is evident also in this sample (*Figure 7*), although generally speaking the fractures are not excessively numerous.

Myositis ossificans traumatica

Myositis ossificans traumatica, resulting from muscle trauma and subsequent ossification, was observed in several bones (*Figure 14* – both humeri: dex. 1.41% and sin. 1.74%, femora: dex. 1.77% and sin. 1.63%, and right tibia 0.30% and fibula 1.82%).

CONCLUSION

The health status and lifestyle of the St. Jacob population, dated to the period of XVth–XVIIIth cent. AD, was analysed by study of long bone lesions. The next step of the study will be an analysis of the population from the

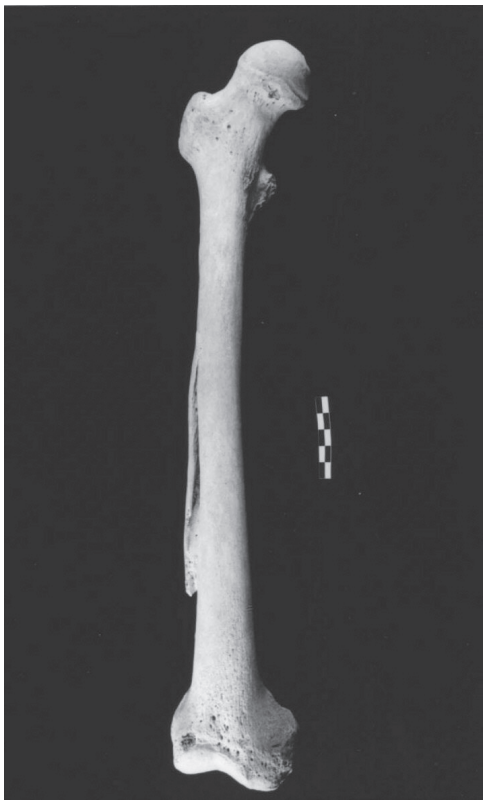

FIGURE 14. Myositis ossificans in a right femur (SvJI/3051).

Romanesque layer of the ossuary, dated to XIIth–XIVth cent. AD, and a comparison with the present results, so that to observe the trends in healthcare and lifestyle of a population, living in the same area through centuries.

ACKNOWLEDGMENTS

We would like to express our gratitude to Mišo Poljak for photographic documentation and to Nora Trúchla for technical help.

REFERENCES

BLÁHA R., 1963: *Rentgenologie kostí a kloubů I, II.* SZN, Praha. 860 pp.

DUTOUR O., 1986: Enthesopathies (lesions of muscular insertions) as indicator of the activities of Neolithic Saharan populations. *Amer. J. of Phys. Anthrop.* 71: 221–224.

HOŠŠO J., LESÁK B., 1995: Archeologický výskum prerománskej rotundy a karnera zaniknutej osady Sv. Vavrinca v Bratislave. *Archaeologia historica* 21, 96: 241–251.

KENNEDY K. A. R., 1989: Skeletal markers of occupational stress. In: M. Y. Iscan, K. A. R. Kennedy (Eds.): *Reconstruction of Life from the Skeleton,* p. 129–160. Alan R. Liss, New York.

LARSEN C. S., 1997: *Bioarchaeology: Interpreting behavior from the human skeleton.* Cambridge University Press, Cambridge. 461 pp.

MANN R. W., MURPHY S. P., 1990: *Regional atlas of bone disease: A guide to pathologic and normal variation in the human skeleton.* Charles C. Thomas, Springfield. 208 pp.

ORTNER D. J., PUTSCHAR W. G. J., 1981: *Identification of pathological condition in human skeletal remains.* Smithsonian Institution Press, Washington. 480 pp.

OWSLEY D. W., MANN R. W., MURPHY S. P., 1991: Injuries, surgical care and disease. In: S. Pfeifer, W. F. Wiliamson (Eds.): *Snake Hill: An investigation of a Military Cemetery from the War of 1812,* p. 198–226. Dundurn Press, Toronto.

PÁLFI G., 1992: Traces des activités sur les squelettes des anciens Hongrois. *Bulletins et mémoires de la Société d'anthropologie de Paris* 4: 209–231.

RESNICK D., GREENWAY G., 1982: Distal femoral cortical defects, irregularities and excavations. *Radiology* 143: 345–354.

ROGERS J., WALDRON, T., 1995: *A field guide to joint disease in archaeology.* John Wiley and Sons, Chichester, New York. 119 pp.

SCHULTZ M., 1988: Paläopathologische Diagnostik. In: R. Knußmann (Ed.): *Anthropologie. Band I. Wesen und Methoden der Anthropologie.* 4th ed, p. 480–496, Gustav Fischer Verlag, Stuttgart, New York.

ŽUDEL J., 1984: *Stolice na Slovensku.* Obzor, Bratislava. 200 pp.

Soňa Masnicová
Radoslav Beňuš
Department of Anthropology
Comenius University
Mlynská dolina B2
SK-842 15 Bratislava, Slovakia
Tel. +421 7 602 96 474
E-mail: masnicova@nic.fns.uniba.sk
E-mail: benus@nic.fns.uniba.sk