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 (XIth–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.
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 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
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 gastrocnemius muscle insertion, active in knee flexion and in linea aspera, site of thighs adductors insertion (Figure 6).
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**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).

**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%.

**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
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.

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REFERENCES


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