Rib anomalies in a Neolithic period skeleton from Croatia

Petra Rajić Šikanjić1,*, Zrinka Premužić2 and Maja Krznarić Škrivanko3

1 Institute for Anthropological Research, Gajeva 32, Zagreb, Croatia
2 Independent researcher, Gajnice 6, Zagreb, Croatia
3 Vinkovci City Museum, Trg bana J. Šokčevića 16, Vinkovci, Croatia
* Corresponding author: petra@inantro.hr
zrinka.premuzic@gmail.com
maja@muzejvk.hr

With 4 figures

Abstract: Congenital anomalies develop during intrauterine development. They can occur in soft tissues as well as skeletal elements and vary from minor to life threatening. In this paper we present a case of an individual from the Neolithic site of Vinka, Croatia. This adult male exhibited multiple congenital anomalies on cranial and postcranial skeleton. These include several rib anomalies on the right side: hyperplasia of the third rib, bifid fourth rib and flaring of the eighth rib. Additionally, lambdoid ossicles, parastyle of the second maxillary molar and supracondylar processes of the humeri are present. In this study we put emphasis on rib anomalies, very rarely reported in archaeological settings, and compare them to clinical cases.

Keywords: rib anomalies; congenital anomalies; Neolithic; Vinka; Croatia

Introduction

Congenital anomalies are physical conditions that develop before birth and present abnormal characteristics (Barnes 2008). Their origin lies in pathological changes that take place during normal intrauterine development (Aufderheide & Rodríguez-Martín 2003). Anomalies can result from two groups of factors that affect the embryo/foetus during genetically critical threshold timing: intrinsic (genetic mutations) and extrinsic (acquired) (Barnes 2012a). Intrinsic factors involve genetic variations/mutations. Extrinsic factors include maternal infection, metabolic disorders and nutritional deficiencies as well as exposure to harmful substances. While intrinsic factors can influence only the embryo, the extrinsic ones can disrupt both embryonic and foetal development (Barnes 2012a; Barnes 2012b).

Anomalies can occur anywhere in the body, soft tissues as well as skeletal elements included (Roberts & Manchester 2005). They can be observed immediately after birth or during later life, depending on the timing of the insult to the developing tissue.

There is a large variety of anomalies, from minor ones that can stay symptomless to those incompatible with life (Aufderheide & Rodríguez-Martín 2003). Minor anomalies can cause no or some degree of functional disturbance but are never life-threatening. Many life-threatening anomalies can be lethal to the developing embryo or foetus, resulting in spontaneous abortions (Barnes 2012a).

In archaeological populations, reconstruction of health is partially limited by the lack of knowledge about the precise time when a certain disease or condition appears. In contrast, study of congenital anomalies provides a limited time-frame since they develop during foetal period (Sture 2001). It is difficult to estimate the frequency of congenital anomalies in archaeological populations. This is due to the fact that severe life threatening defects rarely survive in skeletal remains from archaeological context (Barnes 2012a). In addition to this, in the majority of scientific literature only case reports of minor anomalies can be found, lacking comprehensive studies on population level. If archaeological and modern populations are compared, it seems that congenital conditions are much more frequent today than during the past. However, it needs to be kept in mind that archaeological and clinical studies cannot be directly comparable (Anderson 2000). In analyses of archaeological skeletal material, only diseases causing bone changes will be recognized. On the other hand, in clinical settings mostly cases with symptoms will be identified, in addition to accidental findings (Anderson 2000). Despite these differences, clinical studies should be taken into consideration as they provide indispensable data on incidence, aetiology and characteristics of a certain condition.