



Physical Anthropology Section – 2010

H11 Schmorl's Nodes in the Skeletal Remains of an American Military Population: Frequency, Formation, and Etiology

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After attending this presentation, attendees will understand the patterns of occurrence of a frequent pathological condition, the Schmorl's node, in a U.S. military population.

This presentation will impact the forensic science community by broadening our understanding of factors which may cause and influence the frequency of Schmorl's nodes.

This research considers multiple hypotheses regarding the etiology of Schmorl's nodes. Schmorl's nodes result from herniation of the *nucleus pulposus* of the intervertebral disc through the cartilaginous endplate and into the cancellous bone of the vertebral centrum. The author hypothesizes that the frequency of Schmorl's nodes in military populations will be higher than that seen in most non-military populations, since physical stressors, such as those experienced by those in military training and operations, may increase the incidence of this pathological condition. Schmorl's nodes might also be expected to appear more frequently in farming and athletic populations.

This research investigates the frequency of Schmorl's nodes in differing populations, with new data from a skeletal sample from the Central Identification Laboratory (CIL) at the Joint POW/MIA Accounting Command (JPAC) in Hawaii. The sample consists of U.S. servicemembers (the majority of whom are young Caucasoid males) who served during World War II, the Korean War, and the Vietnam War, with additional servicemembers from the Civil War and World War I. The remains derive from JPAC recoveries of battlefield burials, cemetery exhumations, and turnovers from foreign and domestic citizens and governments.

The current study consists of two samples, a broader study of instances of this pathological condition in CIL case reports and a more specific study examining intact skeletal remains. In the broader sample, 34 of 172 individuals (19.8%) had at least one vertebra affected by a Schmorl's node. This frequency has of course been depressed by instances of incomplete skeletal recovery and poor preservation. In this sample, the greatest concentration of Schmorl's nodes was seen in the

lower thoracic region. In the smaller sample of nearly complete skeletons, 28 of 38 individuals (73.3%) had at least one Schmorl's node present. The greatest concentration of Schmorl's nodes was again seen in the lower thoracic region, with diminishing frequencies seen as the vertebrae get higher and lower in number from this point. Several Schmorl's nodes were also seen in the cervical vertebrae, a finding that has not often been reported.

In a comparison of other studies charting the occurrence of Schmorl's nodes, it was found that the frequency of these lesions can range from 8% to 79% of a population. A number of processes have been implicated in causing Schmorl's nodes, including trauma, the aging process, disease, intrinsic factors, and unknown causes. Of these processes, it is hypothesized that both rapid-loading events on the axial skeleton and repeated stress injuries due to hard physical labor over time are the predominant causes. Age does not appear to be a factor in the formation of these lesions, with similar frequencies found in young and old populations.

Schmorl's Node, Paleopathology, Trauma