ABSTRACT

TITLE:	The Sum of Their Parts: Assessing Drifting and Double Zonal Osteons Within Medieval Kulubnarti, Nubia
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ABSTRACT: Histological studies of bone represent an effective means of reconstructing health and estimating age in ancient populations through the analysis of the frequencies and sizes of discrete remodeling events. Although secondary osteons have been studied extensively, drifting and double zonal osteons are atypical osteons that are not entirely understood. Previous research suggests that drifting osteons may be related to age and double zonal osteons may be associated with periods of physiological stress. The purpose of this study is to determine whether either of these variables varies predictably with age or differs between the sexes and consider the possible implications for understanding health. In this study, rib thin sections from individuals interred at a medieval cemetery from Kulubnarti, Nubia (n=51), were used to assess how drifting and double zonal osteon frequencies relate to age and sex. It was hypothesized that both drifting and double zonal osteons would relate to age, that osteon frequencies would differ between the sexes, and that aspects of growth, development, and health could be inferred for the Kulubnarti population. Thin sections were observed using a compound light microscope. Results show only a weak negative correlation between drifting osteon frequency and age (Spearman's rho = -0.210). Double zonal osteon frequency shows a strong inverse correlation with age (Spearman's rho, p= -0.572). There was no statistically significant difference between the sexes (Mann-Whitney U, p=0.118).These data suggest homogeneity and continuity between the sexes at Kulubnarti and a strong negative correlation between these osteon types and age. Previous research on the Kulubnarti sample has demonstrated the presence of generalized stress. In this sample, double zonal osteons decrease with age supporting the hypothesis that these atypical osteons represent periods of growth arrest, as individuals with more double zonal osteons appear to have a higher risk of dying. Previous studies suggesting drifting osteons decrease with age may be supported by the current study, although further research into the cause of this osteon type is needed, whether for mineral absorption or as a reaction to strain gradients. However it is unclear whether the patterns suggested by this study are always present, specifically for double zonal osteons. Future histological studies should note the negative correlation between both drifting and double zonal osteons to age.