H84   Assessment of Histomorphological Features of the Fourth Rib for Age Estimation in Koreans

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The goal of this study is to assess the histomorphological features, such as osteon population density, relative cortical area and average size of osteon and Haversian canal, of the fourth rib and ascertain the usefulness of histological age estimation method based upon Koreans.

This presentation will impact the forensic community and/or humanity by suggesting the possibility for histological age estimation method based upon Koreans. And this study is a first attempt for histological age estimation method using the fourth rib in Koreans, so it will be contribute to growth of concern for forensic anthropology of forensic sciences in different countries as well as Korea.

Many studies on histological age estimation methods have been made for different bones and populations. Through these reports, the authors have a query about histomorphological variations associated with age in the fourth rib and have need of histological age estimation method applicable to Koreans. The objective of this study is to assess the histomorphological features of the fourth rib and ascertain the usefulness of histological age estimation method based upon Koreans. In this study, 26 rib samples (13 males and 13 females) adjacent to the sternal ends (about 5 cm lateral to costochondral joint) of cadavers with known age and sex were used. The age range for the sample is 33 to 89 years with a mean and standard deviation of 65.0 and 16.5 years, respectively. Two thin sections (less than 100 um thick) per individual were prepared for histological analysis by manual grinding method. Osteon population density was counted using an Olympus BX-51 light microscope with 20x objective and 10x oculars fitted with 10x10 eyepiece reticule (grid factor 0.25 mm^2), and relative cortical area and average size of osteon and Haversian canal were measured using image analysis solutions (Image-pro Plus 4.5.1, Media Cybernetics, Inc.). Statistical regression analysis was performed using age at death as dependent variable. In case of combined sexes, osteon population density showed positive correlation coefficient (r=0.584) and average osteon size showed negative correlation coefficient (r=-0.778), while relative cortical area and average Haversian canal size showed no correlations with age. For simple regression method, average osteon size was selected as independent variable and its R squared and standard error of estimation were 0.605 and 10.564, respectively. Meanwhile an analysis of covariance (ANCOVA) showed significant difference only in osteon population density between the sexes, so when the data for males and females were split for simple regression analysis, each of their R squared was increased from 0.341 in combined sexes to 0.649 in males and 0.378 in females. These results fall within the purview of preliminary study but show the possibility for histological age estimation method based upon Koreans.

Age, Rib Histomorphometry, Koreans