



A86 Accuracy of Estimating Age From Cervical Vertebrae and Mandibular Molar Maturation

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After attending this presentation, attendees will be able to: (1) recognize the potential of Cervical Vertebral Maturation (CVM) as a method of estimating age (particularly when third molars are mature or absent); (2) appreciate the difficulty in assessing biological age in juveniles in order to estimate chronological age; and, (3) understand the need for additional methods to estimate age in young adults between 16 and 21 years of age from radiographs.

This presentation will impact the forensic science community by emphasizing the importance of the fact that age estimation is required for identification of disaster victims and forensic cases as well as minors without documentation and age-disputed asylum seekers.

Shape changes during the maturation of cervical vertebrae are used to assess the pubertal growth spurt and are a potential method to estimate chronological age. The goal of this pilot study was to assess the accuracy of estimating age by CVM and mandibular second (M2) and third (M3) molars in a group of males. The sample consisted of lateral cephalograms of 60 boys aged 10 to 15 years from the Bolton-Brush online collection. A new method of cervical vertebral growth based on the changing size and shape of C2 to C6 was devised using raw data of 69 boys (aged 9 to 15 years) in Lamparski.¹ CVM ages were calculated by transition analysis. Dental age was calculated using molar ages from Liversidge.² The mean difference and absolute mean difference between CVM age and dental ages and chronological ages was calculated. CVM and molar tooth stage assessment reliability was assessed by duplicate readings from previous studies.

Results show that CVM age could only be calculated for 48 boys and those with a bone age of “10 years” could not be aged because of the minimum age of Lamparski’s sample. The number of individuals with M2 developing was 37 and with M3 developing was 43. Thirty-five boys had results for CVM, M2, and M3.

Results for accuracy of age estimation show that the mean difference using CVM was -1.10 years (SD 0.85, N=48), mean difference using for M2 was -0.86 (SD 0.69, N=38) and M3 was -0.37 (SD 0.98, N=43). Absolute mean using CVM was 1.21 year, M2 was 0.91 and for M3 was 0.83. These findings show that mandibular molars were more accurate in estimating age than this method of CVM. It is concluded here that there is a compelling need to develop an appropriate CVM age estimation method particularly around the age threshold of 18 years. This approach could feasibly extend the age range for young adults during which age can be reliably estimated.

References:

1. Lamparsky DG. Skeletal age assessment utilizing cervical vertebrae. Pittsburgh: University of Pittsburgh; 1972.
2. Permanent tooth formation as a method of estimating age: HM Liversidge Karger Publishers 13, 153-157

Cervical, Dental, Age