G23 Third Molar Maturity Index (I3M) for Assessing the Age of Majority: The Experience in Several Different Countries

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After attending this presentation, attendees will be able to use this technique in their daily practices. In addition, this presentation will inspire researchers in other countries to contribute to a project that already involves several nations.

The goal of this presentation is to evaluate a unique method for estimating the 18-year age of majority.

Assessment of legal age, also known as age of majority, is a controversial issue as there are few body biomarkers or other evidence available during late adolescence that may be used to reliably differentiate a subject as being a minor or an adult. Third molar development has been recognized as a suitable subject for age examination in late adolescence.[1,2]

In the past few years, the study of third molar development, and specifically the evaluation of cut-off value, I3M=0.08, has been studied in several samples from different countries, namely Australia, Turkey, Colombia, Albania, Serbia, Libya, Brazil, Peru, Botswana, and Italy.[3-6]

All Orthopantomograms (OPTs) were recorded in JPG format and ImageJ software, version 1.48v, was used to examine the images. OPTs without the accompanying subject's full dental records, lack of birth date, and date when the OPTs were taken, as well as those OPTs of children with proven hereditary or systematic illnesses, malnutrition, severe destruction, extraction, or hypodontia of permanent teeth, and where the third molars were missing, were excluded from the study.

The left lower third molar was assessed using the I3M without knowledge of the subjects' date of birth in order to avoid bias during measuring of specific projections of third molars on OPT, as proposed by Cameriere et al.[7] Briefly, I3M is a ratio of the sum of projections of open apices in multi-rooted teeth or apex width in single-rooted teeth and a tooth length of the mandibular third molar during growth. If third molars were found with entirely closed roots, then I3M=0.00 was recorded. The cut-off value of I3M=0.08 and additional cut-off values close to I3M=0.08 were tested to discriminate adults (≥18 years) and minors (<18 years). For all research and samples, sensitivity, specificity, and correct classification were evaluated.

As regards the Turkey sample for females, the sensitivity was 85.9% (95% Confidence Interval (CI) 77.1-92.8%) and specificity was 100%. The proportion of correctly classified individuals was 92.7%. For males, the sensitivity was 94.6% (95% CI 88.1-99.8%) and specificity was 100%. The proportion of correctly classified individuals was 97.6%.[8]

In the Australian sample, the results demonstrate that the sensitivity is 0.90 in males and 0.90 in females; associated specificity values are 0.85 and 0.87, respectively.[4]

In the Botswana sample, values of sensitivity of the test or the proportion of participants being 18 years and older were 0.88 (95 % CI, 0.87 to 0.90) in males and 0.88 (95 % CI, 0.90 to 0.93) in females, while values of specificity or proportion of individuals younger than 18 who have I3M <0.08 were 0.94 (95 % CI, 0.91 to 0.96) in males and 0.96 (95 % CI, 0.94 to 0.98) in females.[5]

In the Colombian sample, age distribution gradually decreases as I3M increases in both females and males. For females, the sensitivity test was 95.1% (95% CI 87.1%-95%) and specificity was 93.8% (95% CI 87.1%-98.8%). The proportion of correctly classified individuals was 95.1%. For males, the sensitivity test was 91.7% (95% CI 85.1%-96.8%) and specificity was 90.6% (95% CI 82.1%-97.8%). The proportion of correctly classified individuals was 89.7%.[6]

In the Serbian sample, the results demonstrated high sensitivity (0.96, 0.86) and specificity (0.94, 0.98) in males and females, respectively. The proportion of correctly classified individuals was 0.95 in males and 0.91 in females.[9]

In conclusion, the suggested value of I3M=0.08 can be used in several countries with a high rate of accuracy.

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