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Community-Based Reference Interval of Selected Clinical Chemistry Parameters Among Apparently Healthy Adolescents in Mekelle City, Tigrai, Northern Ethiopia

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Abstract : Background: Locally established clinical laboratory reference intervals (RIs) are required to interpret laboratory test results for screening, diagnosis, and prognosis. The objective of this study was to establish a reference interval of clinical chemistry parameters among apparently healthy adolescents aged between 12 and 17 years in Mekelle, Tigrai, in the northern part of Ethiopia. Methods: Community-based cross-sectional study was employed from December 2018 to March 2019 in Mekelle City among 172 males and 172 females based on a Multi-stage sampling technique. Blood samples were tested for Fasting blood sugar (FBS), alanine amino transferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), Creatinine, urea, total protein, albumin (ALB), direct and indirect bilirubin (BIL.D and BIL.T) using 25 Bio system clinical chemistry analyzer. Results were analyzed using SPSS version 23 software and based on the Clinical Laboratory Standard Institute (CLSI)/ International Federation of Clinical Chemistry (IFCC) C 28-A3 Guideline which defines the reference interval as the 95% central range of 2.5th and 97.5th percentiles. Mann Whitney U test, descriptive statistics and box and whisker were statistical tools used for analysis. Results: This study observed statistically significant differences between males and females in ALP, ALT, AST, Urea and Creatinine Reference intervals. The established reference intervals for males and females, respectively, were: ALP (U/L) 79.48-492.12 versus 63.56-253.34, ALT (U/L) 4.54-23.69 versus 5.1-20.03, AST 15.7- 39.1 versus 13.3- 28.5, Urea (mg/dL) 9.33-24.99 versus 7.43-23.11, and Creatinine (mg/dL) 0.393-0.957 versus 0.301-0.846. The combined RIs for Total Protein (g/dL) were 6.08-7.85, ALB (g/dL) 4.42-5.46, FBS(mg/dL) 65-110, BIL.D (mg/dL) 0.033-0.532, and BIL.T (mg/dL) 0.106-0.812. Conclusions: The result showed a marked difference between sex and company-derived values for selected clinical chemistry parameters. Thus, the use of age and sex-specific locally established reference intervals for clinical chemistry parameters is recommended.

Keywords : reference interval, adolescent, clinical chemistry, Ethiopia
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