

Normative Fasting C-Peptide Values Among Adolescents in the National Health and Nutrition Examination Surveys (NHANES)

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Background & Objectives: C-peptide values are used for evaluation of residual beta-cell function as well as endpoints in clinical trials. Therefore, it is crucial to have normative standards as a reference. This study aims to report normative fasting C-peptide values and variations across demographics in adolescents included in the NHANES dataset.

Materials and Methods: In this analysis, we used fasting C-peptide data (n=2063) from the NHANES dataset from 1999-2004 for participants ages 12 to < 18 years old.

Results: The mean \pm SE age of participants was 14.9939 \pm 0.0533, 48% (n=992) were females and 52% (n=1071) were males. The mean BMI-z was 0.4634 \pm 0.0350. Among males, mean C-peptide levels increased from 0.56 nmol/L at age 12, to 0.74 nmol/L at age 15. Mean values decreased slightly at age 16 and increased back to 0.74 nmol/L at age 17. Among females, C-peptide levels fluctuated around an average of 0.72 nmol/L. The mean log-transformed difference in C-peptide between males and females of all ages was significant (p < 0.0001). Females had higher mean log-transformed C-peptide concentrations than males (p<0.0001) after adjusting for age, race, and BMI-z. After adjusting for age, sex and BMI-z, mean log-transformed C-peptide concentrations were higher in Mexican Americans compared to Non-Hispanic Blacks (p<0.0001). After similar adjustments, Non-Hispanic Blacks had lower mean log-transformed levels compared to each of Non-Hispanic Whites (p<0.0001), other Hispanics (p=0.0008), and other races including multi-racial (p=0.0028).

Conclusions: These normative data provide novel information which will be useful in assessing residual beta-cell function and response to intervention therapy.