National Health and Nutrition Examination Survey

August 2021-August 2023 Data Documentation, Codebook, and Frequencies

alpha-1-Acid Glycoprotein (AGP_L)

Data File: AGP_L.xpt

First Published: September 2024

Last Revised: NA

Component Description

Alpha-1-Acid Glycoprotein (AGP) is synthesized in the liver and structurally belongs to the lipocalin superfamily of secretory proteins, such as retinol-binding protein and alpha-1-microglobulin (Schmid, 1975). AGP is a sensitive acute phase reactant whose concentration can increase by a factor of 3 within 24-48 hours when inflammation occurs (Tietz, 1995). It can also be used to differentiate between acute phase reactions (elevated serum level) and estrogen effects (normal or decreased serum level); whereas, the serum level of other positive reactants, such as ceruloplasmin and haptoglobin, increases during such reactions (Ganrot, 1974). Moderate and isolated increases occur when glomerular filtration is inhibited in the early stages of uremia. The determination is used in the assessment of the activity of acute and recurring inflammations as well as of tumors with cell necrosis (Ganrot, 1974).

Eligible Sample

Examined participants 1-5 years old and 12-49 years old females were eligible.

Description of Laboratory Methodology

The Tina-quant Roche AGP assay is based on the principle of immunological agglutination. Anti- alpha-1-acid glycoprotein antibodies react with antigen in the sample to form an antigen/antibody complex. Following agglutination, this is measured turbidimetrically.

Refer to the Laboratory Method Files section for a detailed description of the laboratory methods used.

This was a new component in the NHANES August 2021–August 2023 cycle.

Laboratory Method Files

alpha-1-Acid Glycoprotein (September 2024)

Laboratory Quality Assurance and Monitoring

Serum specimens were processed, stored, and shipped to the Division of Laboratory Sciences, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA for analysis.

Detailed instructions on specimen collection and processing are discussed in the NHANES Laboratory Procedures Manual (LPM). Vials were stored under appropriate frozen (−30°C) conditions until they are shipped to National Center for Environmental Health for testing.

The NHANES quality assurance and quality control (QA/QC) protocols meet the 1988 Clinical Laboratory Improvement Amendments mandates. Detailed QA/QC instructions are discussed in the NHANES LPM.

Mobile Examination Centers (MECs)

Laboratory team performance is monitored using several techniques. NCHS and contract consultants use a structured competency assessment evaluation during visits to evaluate both the quality of the laboratory work and the QC procedures. Each laboratory staff member is observed for equipment operation, specimen collection and preparation; testing procedures and constructive feedback are given to each staff member. Formal retraining sessions are conducted annually to ensure that required skill levels were maintained.

Analytical Laboratories

NHANES uses several methods to monitor the quality of the analyses performed by the contract laboratories. In the MEC, these methods include performing blind split samples collected during "dry run" sessions. In addition, contract laboratories randomly perform repeat testing on 2% of all specimens.

NCHS developed and distributed a QC protocol for all CDC and contract laboratories, which outlined the use of Westgard rules (Westgard, et. al., 1981) when running NHANES specimens. Progress reports containing any problems encountered during shipping or receipt of specimens, summary statistics for each control pool, QC graphs, instrument calibration, reagents, and any special considerations are submitted to NCHS quarterly. The reports are reviewed for trends or shifts in the data. The laboratories are required to explain any identified areas of concern.

All QC procedures recommended by the manufacturers were followed. Reported results for all assays meet the Division of Laboratory Sciences' QA/QC performance criteria for accuracy and precision, similar to the Westgard rules (Caudill, et. al., 2008).

Data Processing and Editing

The data were reviewed. Incomplete data or improbable values were sent to the performing laboratory for confirmation.

Analytic Notes

There are over 800 laboratory tests performed on NHANES participants. However, not all participants provided biospecimens or enough volume for all the tests to be performed. The specimen availability can also vary by age or other population characteristics. Analysts should evaluate the extent of missing data in the dataset related to the outcome of interest as well as any predictor variables used in the analyses to determine whether additional re-weighting for item non-response is necessary.

Please refer to the NHANES Analytic Guidelines and the on-line NHANES Tutorial for details on the use of sample weights and other analytic issues.

Phlebotomy Weights

For the August 2021-August 2023 cycle, analysis of nonresponse patterns for the phlebotomy component in the MEC examination revealed differences by age group and race/ethnicity, among other characteristics. For example, approximately 67% of children aged 1-17 years who were examined in the MEC provided a blood specimen through phlebotomy, while 95% of examined adults aged 18 and older provided a blood specimen. Therefore, an additional phlebotomy weight, WTPH2YR, has been included in this data release to address possible nonresponse bias. Participants who are eligible but did not provide a blood specimen have their phlebotomy weight assigned a value of "0" in their records. The phlebotomy weight should be used for analyses that use variables derived from blood analytes, and is included in all relevant data files.

Demographic and Other Related Variables

The analysis of NHANES laboratory data must be conducted using the appropriate survey design and demographic variables. The NHANES August 2021-August 2023 Demographics File contains demographic data, health indicators, and other related information collected during household interviews as well as the sample design variables. The recommended procedure for variance estimation requires use of stratum and PSU variables (SDMVSTRA and SDMVPSU, respectively) in the demographic data file.

The Fasting Questionnaire File includes auxiliary information, such as fasting status, length of fast, and the time of venipuncture.

This laboratory data file can be linked to the other NHANES data files using the unique survey participant identifier (i.e., SEQN).

Detection Limits

The detection limits were constant for all of the analytes in the data set. Two variables are provided for each of these analytes. The variable name ending "LC" (ex., LBDAGPLC) indicates whether the result was below the limit of detection: the value "0" means that the result was at or above the limit of detection, "1" indicates that the result was below the limit of detection. The other variable prefixed LBX (ex., LBXAGP) provides the analytic result for that analyte. For analytes with analytic results below the lower limit of detection (ex., LBDAGPLC=1), an imputed fill value was placed in the analyte results field. This value is the lower limit of detection divided by the square root of 2 (LLOD/sqrt[2]).

The lower limit of detection (LLOD in ng/mL) for LBXFER:

Variable Name	SAS Label	LLOD
LBXAGP	alpha-1-acid glycoprotein	0.1 g/L

References

- Caudill, S.P., Schleicher, R.L., Pirkle, J.L. Multi-rule quality control for the age-related eye disease study. Statist. Med. (2008) 27(20):4094-40106.
- Ganrot K. Plasma protein pattern in acute infectious disease. Scand J Clin Lab Invest 1974; 34:75-81.
- Schmid K. α1-Acid glycoprotein. In: The Plasma Proteins, 2nd ed. Putnam FW, ed. New York: Academic Press 1975: 183-228.
- Tietz NW, ed. Clinical Guide to laboratory Tests, 3rd ed. Philadelphia, PA: WB Saunders Company 1995; 66-67.
- Westgard J.O., Barry P.L., Hunt M.R., Groth T. A multi-rule Shewhart chart for quality control in clinical chemistry. Clin Chem (1981) 27:493-501.

Codebook and Frequencies

SEQN - Respondent sequence number

Variable Name:	SEQN
SAS Label:	Respondent sequence number
English Text:	Respondent sequence number.
Target:	Both males and females 1 YEARS - 5 YEARS
Target:	Females only 12 YEARS - 49 YEARS

WTPH2YR - Phlebotomy 2 Year Weight

Variable Name: WTPH2YR

SAS Label: Phlebotomy 2 Year Weight

English Text: Phlebotomy 2 Year Weight

Target: Both males and females 1 YEARS - 5 YEARS

Target: Females only 12 YEARS - 49 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
6213.3002375 to 253478.77765	Range of Values	2051	2051	
0	No blood sample provided	513	2564	
.	Missing	0	2564	

LBXAGP - alpha-1-acid glycoprotein (g/L)

Variable Name: LBXAGP

SAS Label: alpha-1-acid glycoprotein (g/L)

English Text: alpha-1-acid glycoprotein (g/L)

Target: Both males and females 1 YEARS - 5 YEARS

Target: Females only 12 YEARS - 49 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.261 to 2.76	Range of Values	1950	1950	
.	Missing	614	2564	