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VITAMIN B12 BLOOD LEVEL VARIATION WITH THE AGE OF PATIENTS

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Introduction. It has been shown that determination of reference intervals (RI) using accumulated general patient data can be a cost effective alternative [3] to special research following C28-A3 guidelines[1]. There are some reports on B12 RI for different ethnicities [2]. There is little and somewhat contradictory information about the B12 RI for different age groups and sexes. In this work the method of calculation of B12 reference intervals from large number of general patient data described by Gavars et al. [3] was used to calculate B12 RI intervals for different sexes and age groups.

Materials and methods. Results of 172597 B12 tests accumulated at EGL from 1st of January 2018 till 21st of November 2021 were used. B12 values were obtained using standard clinical laboratory technique and procedure. Data set consisted of 150 to 400 test results for each one year age interval at the age of 1 to 10 years, and more than 1000 test results for each one year age interval at the ages over 21 years. Mean B12 value and RI was calculated for each age group by 2 years steps. RI interval was calculated by fitting patient density distribution to Gaussian distribution and using only one third of patient data – only those patient data that were close to the mean B12 value were used in the fitting procedure.

Results. High quality B12 mean value and RI data were obtained for each age group and both sexes. Results show distinct variation of B12 mean value with the age of patients. For children B12 mean value raises from 449 pg/l at the age of 1 year to maximum of 665 pg/l at 5-7 years of age. Then the B12 mean value declines to minimum of 410 pg/l at the age of 20 years. From age 23 to 35 the mean B12 value gradually increases to 470 pg/l and stays almost constant during the rest of the lifespan. The calculated reference interval follows the same trend. The difference between calculated high and low RI starts to increase at older age, starting at approximately 60 years of age.

Conclusion. A systematic variation of B12 blood level values with the age was observed with B12 blood level peaking at the age of 5-7 years. Lowest B12 blood level was observed at the age of 17-23 years.

References:

- [1] Gary L. et al., Clinical and Laboratory Standards Institute, vol. 28, no. October, 2010, p. 12.
- [2] W. Jiang et al., J. Clin. Lab. Anal., vol. 34, no. 5, pp. 1–6, 2020.
- [3] D. Gavars et al. submitted to Proceedings of the Latvian Academy of Sciences. Section B: Natural, Exact, and Applied Sciences

Primary author: Mr GAVARS, Didzis (Egils Gulbis Laboratory, Riga Stradiņš University)

Co-authors: Dr AUCE, Agris (Institute of Chemical Physics, University of Latvia); Mr TAUCKELS, Eriks (Egils Gulbis Laboratory); Mrs LINDENBERGA, Ilze (Egils Gulbis Laboratory); Mr PERMINOVS, Dmitrijs (Egils Gulbis Laboratory, Institute of Chemical Physics, University of Latvia); Mrs TUTANE, Anna Inese (Egils Gulbis Laboratory, Riga Stradins University); Ms MIKELSONE, Agnese (Riga Stradins University)

Presenters: Dr AUCE, Agris (Institute of Chemical Physics, University of Latvia); Ms MIKELSONE, Agnese (Riga Stradins University)

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