



Scientific Track: Chemical Pathology

VARIABILITY OF THE SERUM ELECTROLYTES CALCIUM, MAGNESIUM AND PHOSPHATE IN PATIENTS WITH SEVERE COVID-19 DISEASE

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Background: Observations were made that in many COVID-19 cases individual patient's serum calcium, magnesium and/or phosphate (CMP) results were highly variable. This within-subject variation (CVw) was noted to be vastly in excess of normal biological variation (BV). In some cases for example, phosphate levels exceeded both the upper and lower reference interval within periods as short as 24 hours. This phenomenon has not been reported in the literature to date. The aim of this study was to assess the serum calcium, magnesium and phosphate results in hospitalised COVID-19 patients.

Methods: Serum CMP results were extracted for adult patients tested positive for SARS-CoV-2 from March 2020 until March 2021 using data as part of routine management. Serial results (>1) for an analyte are required to determine coefficient of variation (CV). The CVw for CMP was determined. This variability data was compared with well-established BV data.

Results: Biochemical results of 5318 SARS-CoV-2 positive individuals were extracted. 891 Patients had at least one result for calcium, magnesium or phosphate. 328, 356 and 352 patients had >1 result for calcium, magnesium and phosphate respectively. The median (IQR) for all results were 2.13(2.01-2.25), 0.88(0.78-1.00) and 1.17(0.92-1.46). The ranges of values were 1.10-3.46, 0.12-4.17, and 0.10-8.34 mmol/L respectively.

Results below, within and above the reference interval for calcium was 947, 778, 74, for magnesium was 141, 2503, 556 and for phosphate was 396, 188 and 854.

The mean CVw was 6.2%, 12.9% and 27.8% respectively.

Conclusion: The variation in results for calcium, magnesium and phosphate in sick patients with COVID-19 exceeded well-described values for biological variation. Whether this variability is related to the pathophysiology of COVID-19 or due to treatment regimens etc. remains unknown.