COVID-19 RELATED LABORATORY ANALYTE CHANGES AND THE RELATIONSHIP BETWEEN SARS-COV-2 AND HIV, TB AND HBA1C IN SOUTH AFRICA

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Background

~~The aim of this~~This study was done to describe the biochemical and haematological analyte changes ~~seen~~ in COVID-19 patients using South African laboratory data, and to determine the effect of HIV, TB and DM on the risk for acquiring SARS-CoV-2 and ~~the~~ outcomes as measured by intensive and high care admission.

Methods

This was a retrospective analysis of all data for individuals that had at least one PCR test for SARS-CoV-2 at any of ~~our~~ the NHLS laboratories from ~~the period~~ 1st March to 7th July 2020. Test results for TB, HIV and HbA1c was ~~taken~~ included from the six months prior to SARS-CoV-2 testing. ~~Outcome data was not available so we used ICU/high care or critical care admission to determine disease severity. We reported prevalence of HIV and TB for critical versus non-critical groups.~~ HbA1c and CD4 counts were~~was~~ stratified into ~~one of 4 categories: [1] optimal control and normal (<5.7%); [2] controlled or pre-diabetic (5.7 – 6.49%); [3] uncontrolled diabetic (6.5 – 10%); [4] poorly controlled diabetic (>10%)~~categories. ~~CD4 counts were categorized into one of eleven bins, with increments of 100 cells/uL between bins, ranging from 0-99 cells/uL (bin 1) to ≥1000 cells/uL (bin 11). The statistical significance between groups for all results was calculated by Wilcoxon rank-sum test for non-parametric data, the Student's t-test was used for parametric data and Pearson's Chi-square test was used for proportions. A p-value of <0.05 was regarded as significant.~~

Results

We report data for 842,197 individuals, of which 11.7% ~~(98,335)~~ had at least one positive SARS-CoV-2 PCR test, and 88.3% ~~(743,862)~~ tested negative. The mean age for the positive group was 42.3 ~~±15.0~~ years ~~vs. 42.6±14.7 years in the negative group~~ and female prevalence was 61.6% ~~(60,545) vs. 56.3% (419,011) (p<0.001 for both), respectively~~. The overall prevalence of HIV was 6.3% and did not differ between positive and negative groups (p=0.444), but was higher in the critical group ~~(9.15%)~~ than in the non-critical group ~~(6.24%) (p=0.011)~~. The prevalence of uncontrolled diabetes was 3.4 times higher in SARS-CoV-2 positive cases ~~(p<0.001)~~ but was not higher in the critical vs. non-critical cases (p=0.612) ~~(p=0.612)~~. The prevalence of TB in SARS-CoV-2 negative individuals was higher than in the SARS-CoV-2 positive group ~~(p<0.001)~~. The neutrophil-to-lymphocyte-ratio, coagulation markers, urea, cardiac, and liver related analytes were significantly elevated in the critical compared to non-critical cases. Platelet count and creatinine concentration did not differ significantly between the ~~two~~ groups.

Conclusions

Our findings did not support an increased prevalence of either HIV or TB in individuals with SARS-CoV-2 infection but did indicate an increase in disease severity with HIV-positive status. ~~Our~~

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Findings of clear differences in several commonly measured analytes between the critical and non-critical group suggest that these may be useful in our setting to triage patients.