Can HbA1c levels be used as an independent marker of mortality and morbidity risk in patients with COVID19 positive swabs?

NHS East Sussex Healthcare NHS Trust

ABCD - National Conference, UK
16/12/2020. Abstract ID; **260**

Zafar M; Randhawa R S; Hegner J; Alam S; Farooq M; Eldebri R; Barry L; Pun B; Shahbaz M; Makanjuola O A; Cuison F; Safarova D; Lawrence K; Elyasaky A; Nooredinvand H A; Periasamy M; Khanna A; Subba K; Adekunle B A; Ojofeitimi O; Morete Esteves A; Ciroi T M G; Moran S; O'Neill W; Taylor N; Muhammad T; **Dashora U.**

Background

- Diabetes mellitus has been considered significant risk factor for morbidity and mortality for COVID-19[1].
- HbA1c levels are often used as marker of poor glycaemic control and are one way of diagnosing pre-diabetes as well as diabetes[2, 3].
- We tried to explore whether HbA1c levels could be an independent risk factor for mortality and morbidity in patients with positive coronavirus (SARS-COv-2) swabs.

Method

- This was retrospective, multi-centre study of coronavirus swab positive patients who had a recent HbA1c test.
- Their demographic data, medical history, COVID-19 swab and, laboratory results, and final outcomes were analysed.
- Patients were divided into three groups; HbA1c in normal (group 1), pre-diabetic (group 2) and diabetic (group 3) ranges.
- Data was analysed using JASP, and statistical computation using chi-square test.

Results

- A total of 1226 patients had SARS-CoV-2 RNA identification swabs between 10th February 2020 to 1st May 2020.
- A cohort of 120 of these patients, had positive swab results and recent HbA1c results. Mortality rates for group 1 (Normal HbA1c) and 3 (Diabetic HbA1c) were relatively higher than group 2 (Pre-diabetic HbA1c).
- Among the group 2 it was the female gender with greater mortality, perhaps because of fewer male patients, although overall comorbidity was less 4/120 (3.33%) in pre-diabetic group as opposed to 18/120 (15%) in normal HbA1c group and 14/120 (11.66%) in high diabetic group.
- Overall **36/120 (30%)** patients died and **84/120 (70%)** survived.
- Survival curves after analysis of data showed that increasing HbA1c levels were associated with poorer outcomes across all groups. Analysis was significant with p-value of 0.003

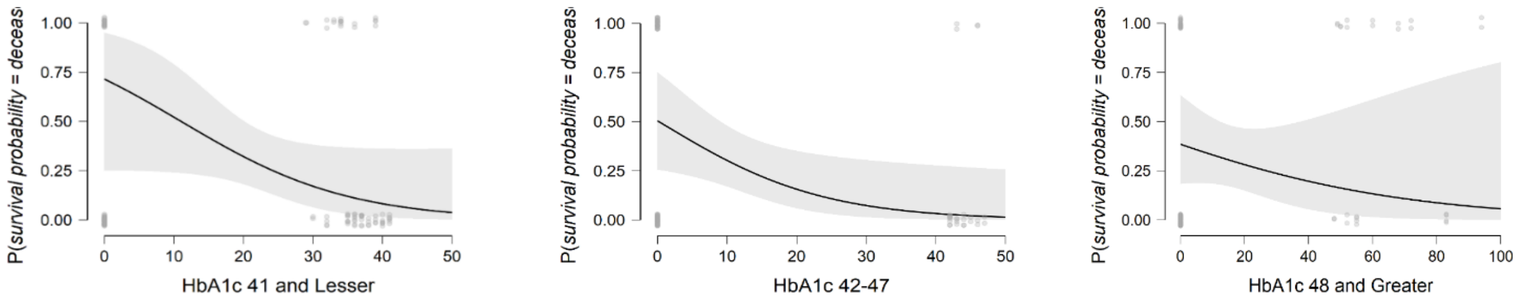

Figure 1 Survival Probability across all groups of HbA1C. Grey shades is 95% Confidence Interval. Dots are data plots. Negative correlation across all groups of HbA1c suggesting other variables (comorbidity) that contributed besides HbA1c towards increased mortality with variation in HbA1c.

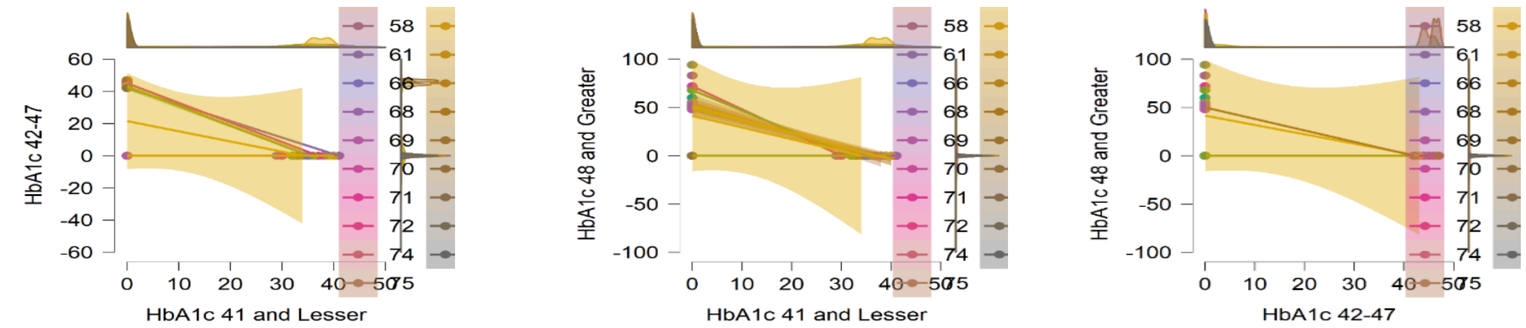

Figure 2 Scatter-plot demonstrating negative correlation among the three HbA1c groups, for all comorbidities combined. The shaded area represents the 95% confidence interval.

Conclusions

HbA1c levels in this study were an independent marker of increased risk of mortality in COVID19 swab positive patients. The findings are statistically significant with p 0.003.

Increased comorbidities at normal HbA1c seem to have contributing role in enhanced mortality.

References; (Vancouver Style Format)

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Acknowledgements

The authors would like to acknowledge the contribution of the Microbiology Laboratory at East Sussex Healthcare NHS Trust. We are also thankful to Ethics Committee and Department of Medical Illustration at East Sussex Healthcare NHS Trust. No funding was offered or taken.