AN AUDIT ON THE USE OF VARIABLE RATE INTRAVENOUS INSULIN INFUSIONS IN PATIENTS DIAGNOSED WITH SARS-COV-2

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Introduction

The use of Variable rate insulin infusions (VRIII) require high level of patient care and resources. JBDS has advised essential measures for safe maintenance of VRIII, which we aimed to assess during the challenging times of constrained resources of the SARS-CoV-2 pandemic.

Aim

To assess VRIII utilisation in SARS-CoV-2 positive patients with diabetes mellitus at Queen Elizabeth Hospital, Birmingham and adherence to Joint British Diabetes Society (JDBS) standards.

Methods

It was a retrospective data-based study. All patients admitted to Queen Elizabeth Hospital Birmingham, who tested positive for SARS-CoV-2 requiring VRIII between March and June 2020 were included in the study.

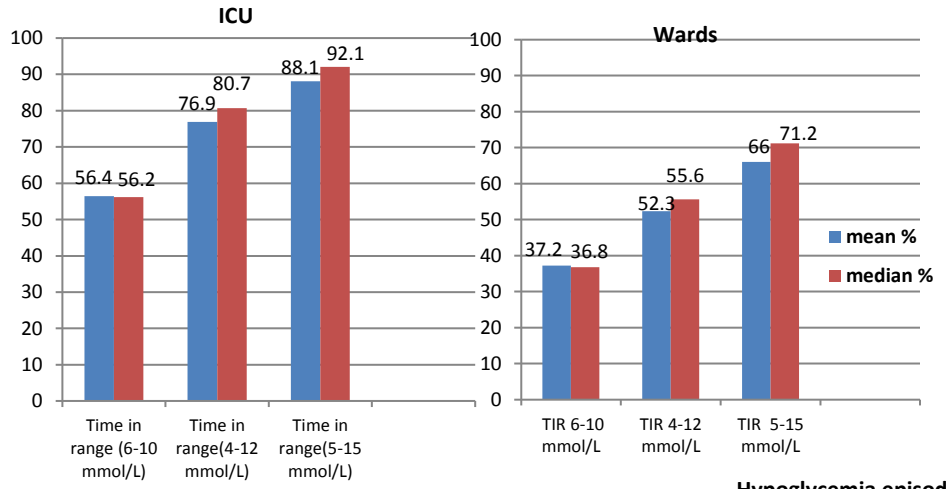
Data was extracted using our electronic database Prescribing Information and Communication System (PICS).

Data were collected on demographics, diabetic history and VRIII use. Primary outcome measures were substrate use, diabetes medication management, glycaemic control, adverse events as analysed by rate of hypoglycaemia, hyponatraemia and hypokalaemia and monitoring of renal function and capillary blood glucose, in accordance with the JDBS guidelines. Pre-planned subset analysis was performed based on the patient location; Ward and Intensive Care Unit (ICU). All results shown age median averages (+/- standard deviation).

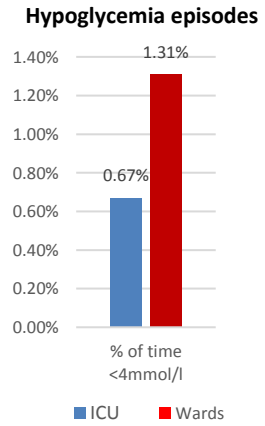
Results

A total of 85 patients were included in the study with 55 patients treated in intensive care and 28 patients treated on the wards.

The median age group in ICU patients was lower at 57 years (± 10.23) compared to those on the ward 71.5 years (± 16.81). They also had a higher BMI at 29.7 kg/m² (± 6.56) compared to 27.8 kg/m² (± 6.43) on the ward. The percentage of male patients was higher in ICU at 76.4% (42/55) compared to the ward at 53.6% (15/28). The substrate was used appropriately in 53.3% of VRIII episodes on the ward, compared to only 5.4% on ICU. This was due to the concomitant use of NG feeds in 90%. Daily monitoring of electrolytes whilst on a VRIII was higher in ICU at 94.5% (52/55) than on the ward at 71.42% (21/28).Long acting insulin was continued in 100% of all type 1 diabetes in both wards and ICU. Median VRIII duration was higher in ICU, given prolonged stay and being more unwell, at 233 hours (± 184.32) vs 14.5 hours (±52.26) on the ward. Target glycaemic control whilst on VRIII was better achieved in ICU than wards , as shown in the graph.



Hyponatraemia*	ITU	Non ITU
Number of episodes with at least 1 hyponatraemia (<130 mmol/L) n(%)	5 (9.3)	3 (11.1)
Number of episodes with at least 1 hyponatraemia (<125 mmol/L) n(%)	1 (1.9)	1 (3.7)
Average rate hyponatraemia/ 24 hours on VRIII (3.5mmol/L)	0.01	0.29
Average rate hyponatraemia/ 24 hours on VRIII (2.5mmol/L)	0.005	0.03
Hypokalaemia*	**ITU**	**Non ITU**
Number of episodes with at least 1 hypokaelamia (< 3.5mmol/L) n(%)	16 (30.2)	3 (11.1)
Number of episodes with at least 1 hypokaelamia (< 2.5mmol/L) n(%)	0 (0)	1 (3.7)
Average rate hypokalaemias/ 24 hours on VRIII (3.5mmol/L)	0.31	0.25
Average rate hypokalaemias/ 24 hours on VRIII (2.5mmol/L)	0	0.11



Conclusion

Intensive care with close monitoring has demonstrated better adherence to VRIII as outlined by JBDS for management of hyperglycaemia in patients with diabetes and COVID 19. The longer use of VRIII in unwell intensive care patients may be a reflection of higher insulin insensitivity. But this will require further interventional multicentre study to gain further insight.

References

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