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Introduction

Many patients with confirmed COVID-19 were found to have electrolyte disturbances particularly disorders of sodium concentration (dysnatraemias)

Aims

- To assess the frequency of dysnatraemias in patients with COVID-19
- To explore potential causes for disturbances of sodium concentration in patients with COVID-19

Methodology

All COVID-19 positive patients over a **3 month period** were analysed (using ECR)

Serum sodium, potassium, urea, creatinine, bicarbonate, chloride were recorded, as well as **the most abnormal sodium concentration during admission**

Patients were subcategorised into those requiring **CPAP, ICU admission & mortality**

We hypothesized that there was an association between dysnatraemia & severity of disease (defining disease severity as requiring respiratory support)

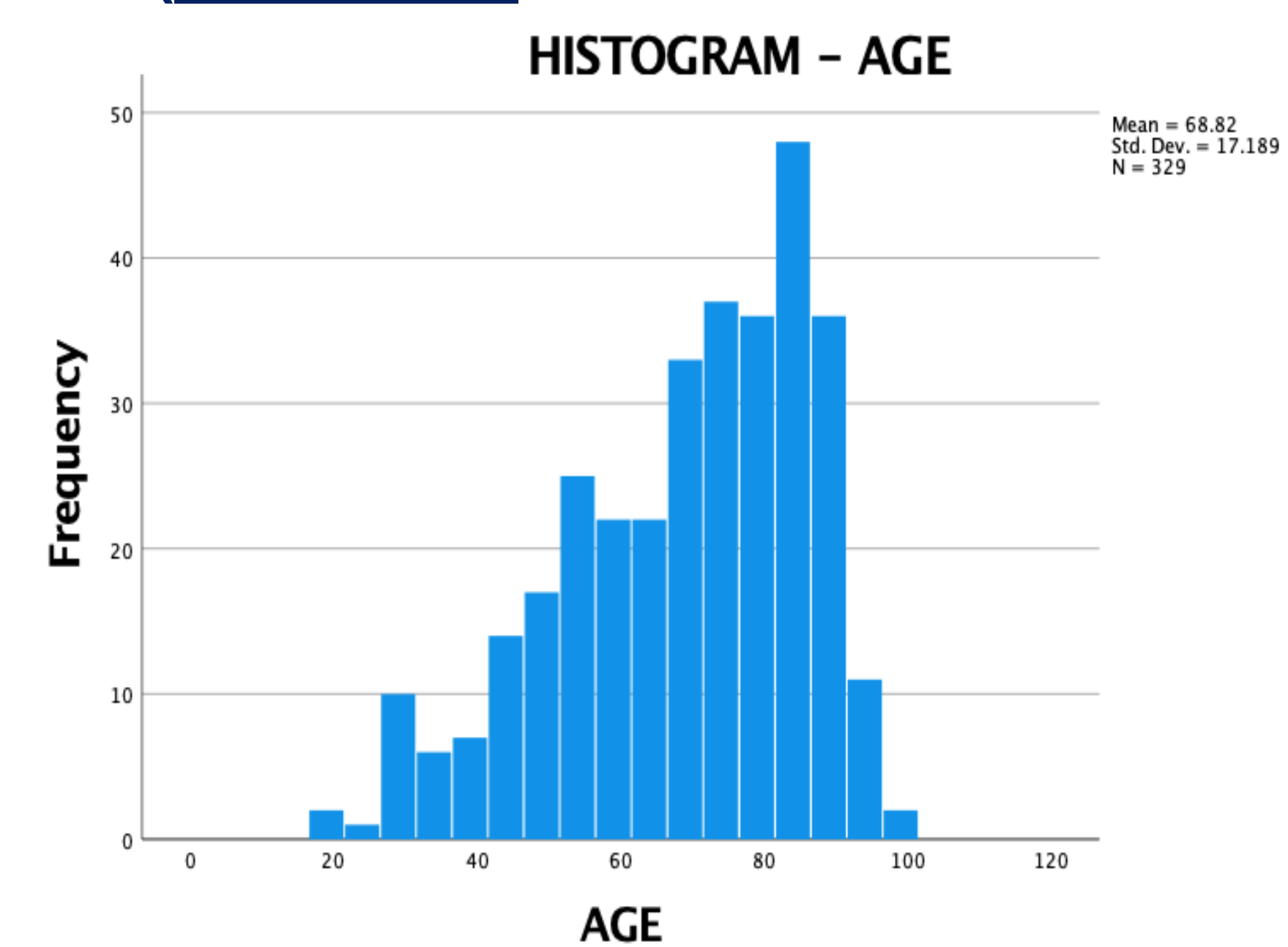
Results

332 inpatients tested positive for COVID-19 between 11/3/2020–17/5/2020

1 incomplete data set removed, 2 data sets removed due to inaccurate biochemical results

Total analysed was 329

Average age 69 (range 19-98) years old
179 (54%) male



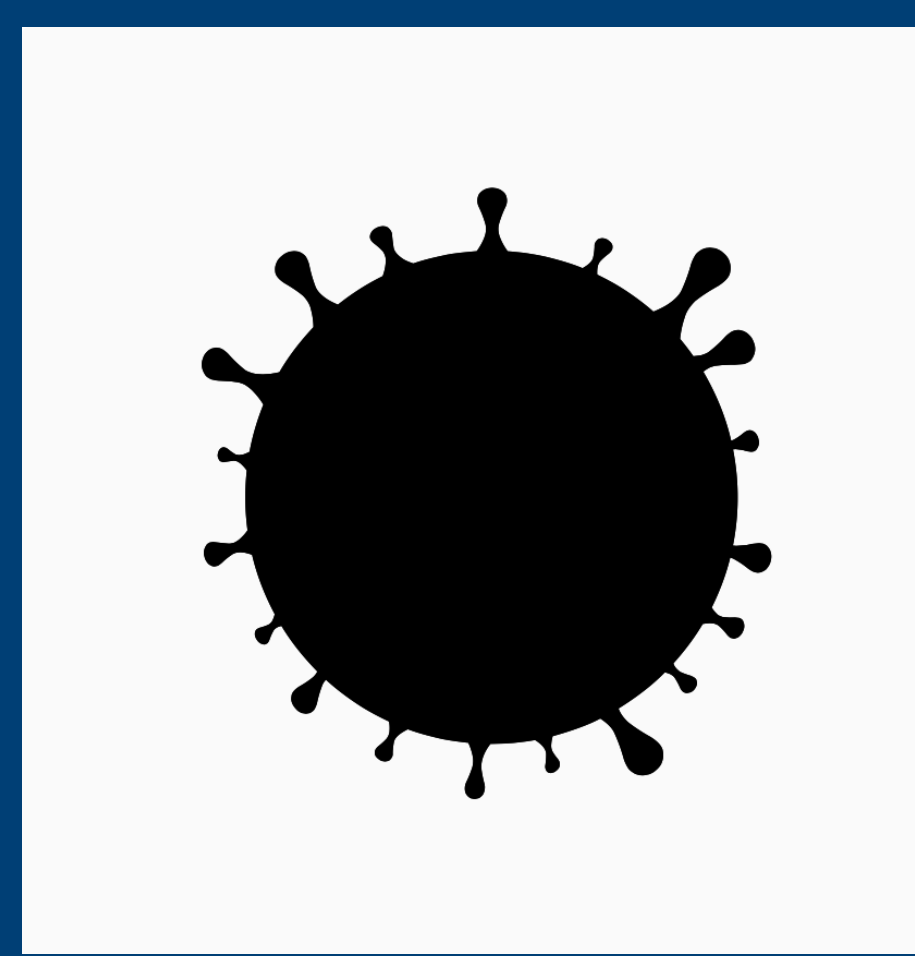
Salts in the body during a pandemic

Dysnatraemias are common among hospitalised patients with SARS-CoV-2 (COVID-19) & are associated with poorer outcomes

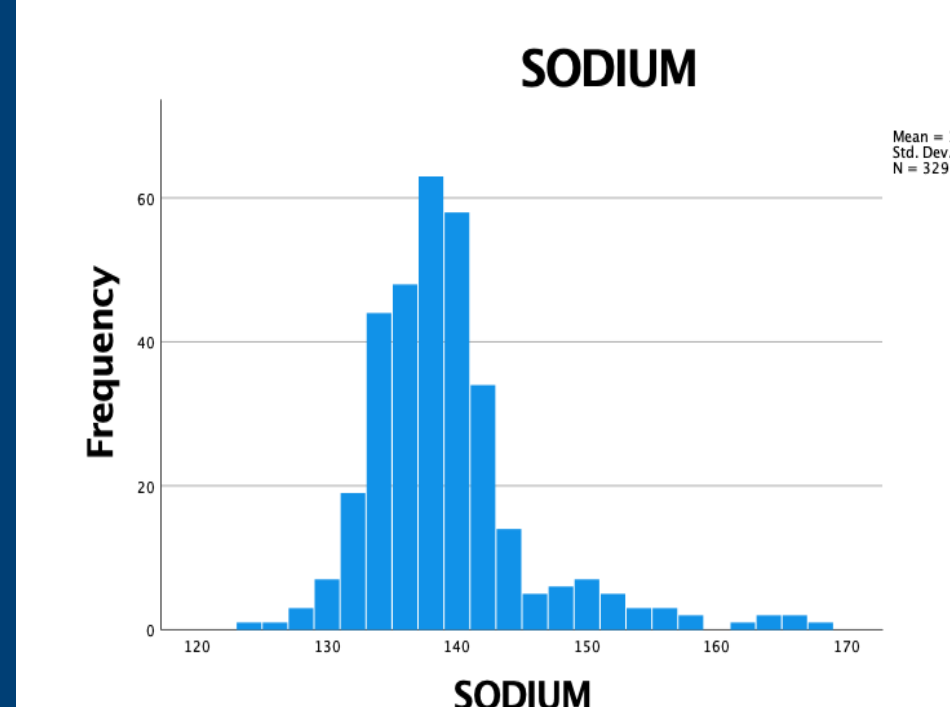
Does it matter?



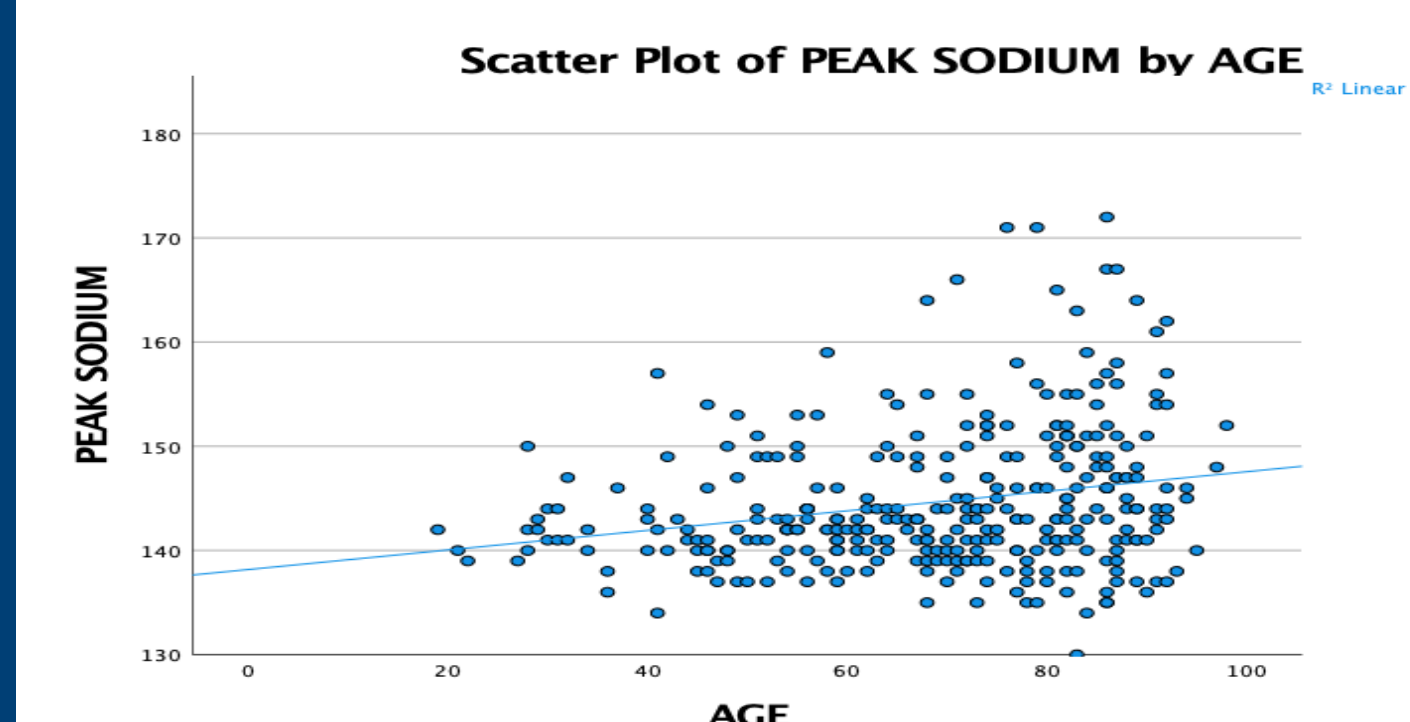
HSC Belfast Health and Social Care Trust
caring supporting improving together



177 patients (53.8%) were dysnatraemic (defined as $\text{Na}^+ < 134$ or > 145 mmol/L) during admission
75 patients (22.8%) were hyponatraemic
121 (37%) were hypernatraemic
*demonstrating that some patients incurred both extremes of sodium regulation



48% >70year olds were hypernatraemic



Of 27 patients admitted to ICU:

- **23 (85.2%) were dysnatraemic** ($\chi^2(1) = 11.657$ $p < .001$)
- **10 (37%) were hyponatraemic**
- **19 (70.3%) were hypernatraemic** ($\chi^2(1) = 3.389$ $p < .001$) *demonstrating again how some patients experienced both hypo & hypernatraemia
- **Of 10 patients who died in ICU 9 (90%) were dysnatraemic**

Overall, of 88 patients who died, **50 (56.81%) were dysnatraemic**

60 patients required CPAP/NIV, **17 (28%) were hypernatraemic**

Conclusions

- **Dysnatraemias were common (> 50%) & associated with worse outcomes**
- In our cohort, **hypernatraemia was more common**

Multiple **potential aetiologies** include:

- **Fever, hyperventilation & poor fluid intake** prior to admission predispose to hypernatraemia
- excessive **GI losses** associated with SARS-CoV-2
- **Fluid imbalance in patients receiving CPAP/NIV/ventilation** - aim initially in avoiding hypervolemia / diuretics
- **potential local activation of ACE2 (by SARS-CoV-2)** increased Angiotensin II & Aldosterone -> avid renal sodium reabsorption & hypernatraemia

Electrolyte and fluid balance disorders are common in patients with SARS-CoV-2 and associated with poor outcomes

The aetiologies underpinning these disorders are complex

Meticulous attention to fluid and electrolyte balance may improve outcomes