

Inpatient Hyperglycaemia and Impact on Morbidity and Mortality

Farrugia Y, Mangion J, Fava MC, Vella C, Gruppetta M



INTRODUCTION & AIMS

Hyperglycaemia is frequent among hospital patients. We examine the relationship between hyperglycaemia on admission and morbidity and mortality.

METHODS

We retrospectively examined the records of 1132 hospital admissions. Hyperglycaemia was defined as an admission random glucose level of above 11.0mmol/l. Statistical analyses utilized the Mann-Whitney U test, complemented by Spearman's rank correlation and Chi-squared tests, with a significance level of 5%.

RESULTS

Hyperglycaemia was present in 14.1% of hospitalised patients, of whom 3.9% had no previously documented history of diabetes. Patients with new-onset hyperglycaemia on admission, had a significantly higher mortality rate than previously diagnosed diabetes (43.3% vs 17.9%, $p=0.006$). Logistic regression showed that plasma glucose on admission was independently associated with increased one year mortality (odds ratio 1.035; $p=0.034$).

CONCLUSIONS

Our results indicate that plasma glucose is an important prognostic marker and may indicate a more severe illness. We recommend that these patients are highlighted with a greater level of care. A glycosylated haemoglobin level taken at admission in cases of new-onset hyperglycaemia can aid differentiation between stress hyperglycaemia and undiagnosed diabetes.

	Mortality		p-value
	Yes (Median, IQR1-IQR3)	No (Median, IQR1-IQR3)	
Age on Admission (years)	80.0 (71.0 - 86.0)	69.0 (49.0 - 80.0)	<0.001
Length of Stay in Hospital (days)	6.0 (3.0 - 13.0)	3.0 (2.0 - 6.0)	<0.001
Plasma Glucose on Admission (mmol/l)	7.0 (5.8 - 9.8)	6.4 (5.5 - 8.43)	0.005
Serum Creatinine ($\mu\text{mol/l}$)	94.0 (70 - 142.8)	81.0 (65 - 105.5)	<0.001
Serum Urea (mmol/l)	9.2 (6.7 - 14.9)	6.5 (4.8 - 9.3)	<0.001
Estimated GFR (ml/min/1.73m^2)	60.0 (36.0 - 88.5)	80.0 (56.5 - 103.0)	<0.001
Serum Sodium (mmol/l)	138.0 (135.0 - 140.0)	139.0 (136.0 - 141.0)	0.005
Serum Chloride (mmol/l)	98.0 (94.2 - 101.6)	100.2 (97.1 - 102.6)	<0.001
Serum Osmolality (mOsm/kg)	302.2 (294.6 - 314.0)	300.8 (295.0 - 307.0)	0.020

Plasma Glucose on Admission (mmol/l)	Mortality n (%)	p-value	Re-hospitalised n (%)	p-value
Known Diabetic		0.006		0.003
< 11	36 (22.8)		90 (57.0)	
> 11	14 (17.9)		44 (56.4)	
Not Known Diabetic				
< 11	90 (18.1)		217 (43.6)	
> 11	13 (43.3)		10 (33.3)	

Table 1 - Continuous variables significantly related with mortality at one year (analysed using Mann-Whitney U test); Acronyms used: IQR: Interquartile Range, GFR: Glomerular Filtration Rate

Table 2 – Diabetes history and blood glucose on admission related with mortality and re-hospitalisation at one year