Introduction of a protocol and daily endocrine specialist nurse ward visits in the management of hyponatraemia

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1. Aims

Hyponatraemia is associated with an increase in morbidity and mortality, prolonged hospital stays and poor assessment and management. It affects 10-25% of all inpatients and has a clear associated mortality; patients >65 with hyponatraemia are twice as likely to die as those who do not. It is thought that resolution during hospital stay may attenuate the increased mortality rate(1). A protocol for clinical staff was devised with daily specialist nurse ward visits to meet the following aims:

- To ensure that hyponatraemia is investigated appropriately
- That low sodium is corrected promptly and at the correct rate
- To investigate the effect of hyponatraemia on length of stay

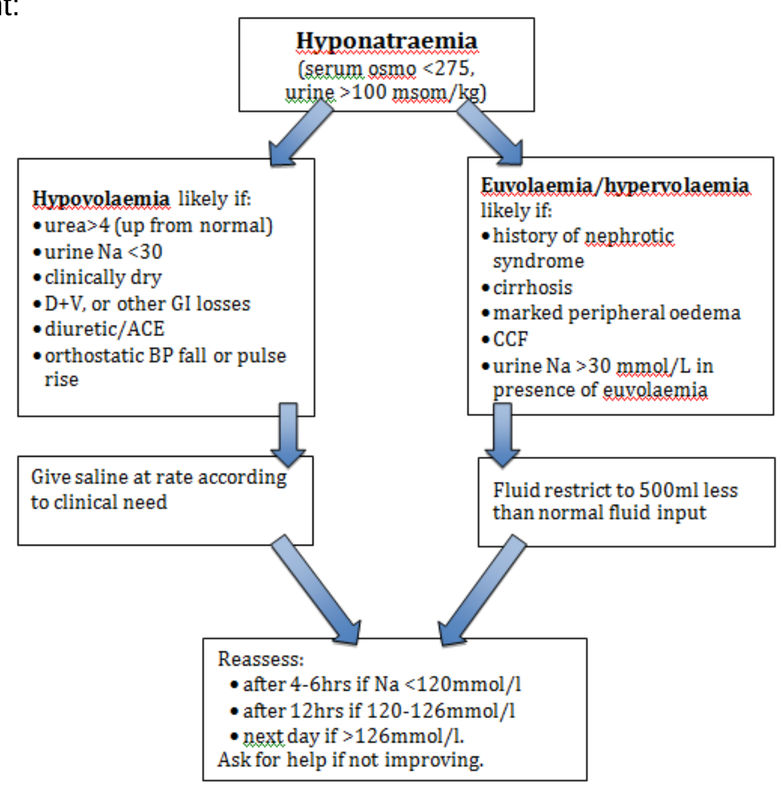
Two audits analysed Acute Medical Unit admissions with sodium <130mmol/l, pre- and post-protocol, in April and July 2013 (58 patients in April 2013; 99 in July 2013).

2. Summarised Protocol

Doctors to investigate with the following:

- paired osmolalities, urinary sodium, random cortisol, TFTs, CXR
- estimation of patient's normal fluid intake at home

Management:



Nurses to ensure accurate fluid balance is recorded with daily weights.

4. Audit

Inclusion criteria: All admissions to AMU with sodium <130mmol/l in 1 month period pre and post-protocol with the same cohort of junior doctors

Assessment criteria:

1. Sodium on admission, at 24 hours and on discharge
2. Length of stay
3. Specialty at discharge
4. Appropriate investigations ordered
5. Fluid status assessment and completion of fluid chart
6. Mention of hyponatraemia on the post-take ward round and appropriate coding

In addition, rate of readmission and previous episodes of hyponatraemia were recorded.

5. Results

	AMU Average (%)	April Patients (n)	July Patients (n)
No. Of Patients		58	99
Over age of 65	62.22	45 (77.59%)	74 (75%)
Over age of 80	32.32	29 (50%)	46 (46%)

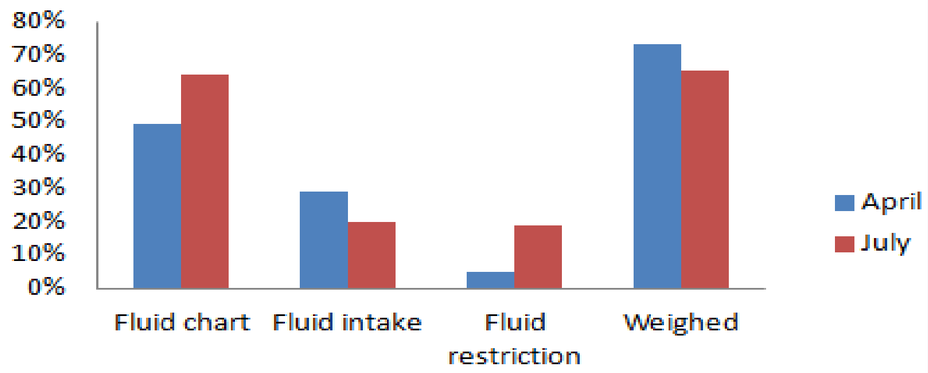
Length of stay & Readmission

	AMU (days)	↓Na April (days)	↓Na July (days)
Mean length of stay (excluding RIP pts)	6.47	9.12 (7.38)	10.57 (9.17)
LOS Na < 127		8.2	9.7
Patients >65 (Excluding RIP)	8.09	10.34 (9.05)	12.04 (11.56)
Patients >80 (Excluding RIP)	9.16	9.97 (7.74)	12.55 (11.81)
Number RIP	5.6% (April) 3.7% (July)	6 (10.3%)	8 (8.1%)
Readmission within 30 days (%)	13.28	21.15	30.77

Biochemistry measured

Investigation	Sodium <130 mmol/l		Sodium <127 mmol/l	
	April Patients (n = 58)	July Patients (n = 99)	April Patients (n = 26)	July Patients (n = 50)
Serum osmolality	14 (27%)	42 (42%)	11 (42%)	27 (54%)
Urine Osmolality	9 (17%)	23 (23%)	9 (35%)	22 (44%)
Urine Na	5 (10%)	19 (19%)	5 (19%)	11 (22%)
Cortisol	12 (23%)	44 (44%)	11 (42%)	36 (72%)
TSH	21 (40%)	55 (55%)	13 (50%)	27 (54%)

Fluid assessment



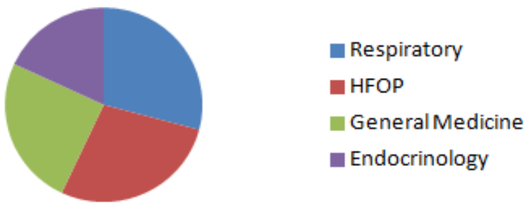
Correction of sodium

	April	July
Improvement at 24hrs	65%	82%
Na normal at discharge	19%	28%

Post-taking and beyond

57% had hyponatraemia mentioned in post-take ward round (47% pre-protocol)

Most common discharge specialities:



Coding

	April (n = 58)	July (n = 99)
Coded for Hyponat <130	19 (33%)	26 (26%)
Patients Hyponat <127	26 (44%)	50 (50%)
Total additional income if appropriately coded (Where Na <127 **only**)	£2368	£4172
		=£39240/year

6. Conclusions

Highlighting hyponatraemia led to better documentation, closer monitoring, improved resolution at 24 hours and at discharge and earlier specialist opinion if not improving. Anecdotally, junior doctors and nurses found the protocol and intervention useful. Assessment of fluid intake and urinary sodium, however, remained poor.

Coding (and income) is improved by appropriate documentation on the post-take ward round. European Society Clinical Practice Guidelines (2) rely on prioritising urinary sodium and osmolality (prior to initiation of treatment). Introduction of the protocol and nurse support, along with paired samples and early biochemical evaluation are vital to achieve this. Links on the pathology system to the protocol also aim to prioritise this.

Although no evidence that correction changes mortality, it could be hypothesised that improving hyponatraemia may improve confusion and muscle strength and therefore lead to earlier discharge and reduced readmission. Early recognition of hyponatraemia also acts as a 'red flag' for those with potentially worse outcomes.

1. Terzian et al. 'Mortality after hospitalisation with mild, moderate and severe hyponatraemia' Journal Geriatric Internal Medicine 9:89; 1994
2. Spavoski et al. 'Clinical practice guideline on diagnosis and treatment of hyponatraemia' European Journal of Endocrinology. 170.G1-47; 2014