Review of Assessment (Diagnosis) of Hyponatraemia

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Introduction

Hyponatraemia is the commonest electrolyte disorders encountered in Hospitals. The aetiology of hyponatraemia is based on clinic assessment and biochemical investigations. However, studies have shown that recommended guidelines are usually not implemented.

Aim

Review of Assessment (Diagnosis) of Hyponatraemia and outcome based on length of stay (LOS) in Hospitals.

Methods

A systematic search using PUB Med and Med Line, including an Internet search of published abstracts from British Endocrine Society, European Endocrine Society and Lung Oncology was conducted between 2002 and 2014 in UK hospital settings.

Results

18 publications were identified using search criteria using the key word hyponatraemia combined with investigations, management and outcomes. Two were journal publications and the rest were abstract submissions which were of retrospective audit analysis of patients admitted with hyponatraemia in hospitals. Total of 2052 patients and the duration of the studies vary from 2 weeks to 52 weeks. There was wide variability with definition of hyponatraemia and S Na <130mmol/l and <125 mmol/l were commonly used. The aetiology diagnosis of SIADH was mentioned in all studies but only average score of 25 % was recorded in all domains with regards to serum and urine osmolality and urine sodium. The average score improved to over 50% when cut off S Na was less than 125 mmol/l. The LOS was reported in 9 studies and overall mean was 16 days.

Conclusions

Though the definition of hyponatraemia is <135 mmol/l, the audit findings seem to indicate there is higher threshold for detailed biochemical investigations when S Na is <125 mmol/l and to some extent when S Na falls to less than 130 mmol/l. This probably reflects under investigations with accurate diagnosis of hyponatraemia which would have an impact on management as shown in recent published study (Tzoulis et al, PGMJ 2014;0:1-5).

Study	Authors	Year	Number of Pts	Study Period	Definition of Hyponatraemia	Tests conducted	Aetiologies identified	Management options if recorded	Length of stay results
Severe Hyponatraemia: Investigation and management in a district general hospital	O Saeed et al	2002	42	6 months	<120mmol/l	33% urinary electrolytes/osmolality tested	19% had diagnosis of SIADH		
Severe Hyponatraemia in medical in patients: aetiology, assessment outcome	J Clayton et al	2006	108	6 months	<125mmol/l	61% sreum osm/ 46.7% urine osmo/ 40% urine Na. 91.4% LFT, 48.6% TFT,15.2% random cortisol/SST 84%, Xray chest 23%			Mean length of in patient stay -16 days (range 1-21)
Audit of inpatient management of hyponatrameia	B Patel et al	2012	218	4 weeks	<125mmol/l	60% urinary sodium , 80% serum osmolality 20% thyroid function tests 14% 9am Cortisol	42% idiopathic 26% drug induced 26% SIADH 6% Hypovolaeic causes		Mean length of stay was 16 days (4-56), trust mean was 5 days.15% of prolonged LOS due to hyponatraemia.
Hyponatremia in hospitalised patients: are we investigating and managing them properly?	A Murza et al	2012	170	2 weeks	<130mmol/l		Euvolemic 26%, Hypovolemic 18%, Hypervolemic – 22%, Not mentioned – 33%. Only 2 patients had investigations for SIADH.	6 (22%) patients received fluid restriction, IV fluid – 1, Demeclocycline – 1, diuretics withheld - 1, ITU admission – 3.	Average Length of stay was 15.6 days (1-51 days)
Audit of the consequences of hyponatraemia in an inpatient cohort at a tertiary health centre	C Hadjittof et al	2011	286	2 weeks	<131mmol/l	Urinary Sodium, plasma osmolality and urinary osolality measured in 8,7 and 4 pts respectively (Group1)	17% of Gp1 assigned an aetiology, SIADH (7%) being commonest	Fluid restriction only treatment option recorded	Group 1 29 days LOS on average
An audit on management of hyponatraemia in hospitalised patients	V Katreddy	2013	109	12 weeks	< 133mmol/l	13.7% had paired serum and urine osmolality and urine sodium estimations, random cortisol measured in 15.5% patients, short synacthen test in 9.1% and thyroid function tests in 23.8%	47% due to hypovolaemia. Fluid overload and SIADH was attributed in 15%, drugs in 11% , diuretics being the main drugs (87%).In 6% cases there was no documentati about etiology.	58% treated with fluid restriction	Average LOS was 12.4 days
Hyponatraemia assessment and outcomes in acute medically ill patients	A Hughes et al	2013	100		< 130mmol/l	Serum cortisol (n= 6), plasma osmolality (n=9), urine osmolality (n= 9), short synacthen test (n=0),urine sodium (n=3), thyroid function tests (n=19).			
Audit on investigations/ diagnosis of hyponatraemia (in-patients district hospital)	N Sithamparnathan	2014	283	4 weeks	<135mmol/l	Only 11% patients had any investigations	Only identified in 23% of patients	None reported	Overall medical stay was between 3-15 days longer than patients in medical and surgical patients than in other patients admitted in MAU
Management of Hyponatraemia in secondary care	S Mescall	2014	33	4 weeks	125mmol/l	Serum/urine osmolality, TFT's, urinalysis, serum cortisol, myeloma screen, CXR, fluid intake, and medication review.	Identified in 70% of patients	None reported	
Investigation of inpatient hyponatraemia in a teaching hospital	P Tzoulis	2014	139	12 weeks	128mmol/l				
Severe hyponatraemia in patients admitted to acute medical unit	M Sadeghi	2013	25	12 weeks	≤ 120mmol/l		44% hypovolaemic hyponatraemia 9% hypervolaemic hyponatraemia related to heart and liver diseases, 5% normovolaemic hyponatraemia related to SIADH related to drug therapy		< 1 week in 56% patients 44% patients stayed for more than a week
Hyponatraemia: ignored or ignorance?	V Hundia	2005	90	52 weeks	≤ 120mmol/l	Postural blood pressure measured (10%) renal function in 100% cases, TSH(22%), FT4(20%), Pl.glucose (45%), cholesterol (12%), Triglycerides(3%), LFT (74%), 9am Cortisol (3%), SST (2%), plasma osm(23%) and urine osmo (19%). Urine Na (9%)	10.5% diuretic use 6.8% SIADH	33% patients had a management plan involving fluid restriction and stopping diuretics	
Managing Hyponatraemia- a challenge	GK Simon	2009	52	57 days	<125 mmol/l	45% paired urine/plasma osmolalities and urine sodium , volume status recorded in all patients.	65% diurtics, 15% anticonvulsants, malignancy 10%, no cause 20%		
Severe hyponatraemia: assessment and management	A Bala	2008	96	52 weeks	< 120mmol/l	Fluid status (43%), urinary sodium, paired osmolalities (30%) and identification of underlying cause		Fluid restriction (43%)	
Management of hyponatraemia , are we doing enough?	H Soran	2005	91	3 months	<132-146mmol/l	Glucose, creatinine, urea and electrolytes. TFT (44.3%), Urine osmolality(22.8%), urine sodium (18.6%), and SST(11.4%)	In 65.7% of patients there was no clear disgnosis made. Hepatic disease (53%) common in pts < 65 yrs, iatrogenic causes (33%) commonly seen in > 65 years		
The investigation and management of critical hyponatraemia	R Quinton	2006	32	6 months	< 120mmol/l	urine sodium ad serum/urine osmolalities only checked in 20/30 cases	Diuretics (27%), carcinoma (13%) lower respiratory tract infections (7%) SIADH inaccurately diadgnosed in 37%		
An audit of hyponatraemia in a large UK university teaching hospital	M Glover	2014	75	2 weeks	<131mmol/l	Electrolytes, plasma osmolarity, urine osmolarity, spot urinary sodium, volume status (43%)	Identified in 37.3% patients- 11 patients had SIADH, 21% malignancy, Heart failure 17%, thiazides 16% and SSRIs 7%		Average LOS 18.2 days
Investigation and management of severe hyponatraemia-cause for concern?	M Huda	2004	104	6 months	<125mmol/l	Plasma sodium, plasma creatinine and glucose conducted in all patients. 26% plasma osmolality, 27% urine osmolality, 10% urinary Na, 8% plasma cortisol and 28% SST	No cause found 49% vs 27%, SIADH 20% vs 33% and alcohol 6% vs 11%	No interventions in 42%, fluid restriction 36%, IV Saline 24% and both fluif restriction and IV Saline in 7%	Average LOS 16 +/-12 days

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Pituitary basic and neuroendocrinology
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DOI: 10.3252/pso.eu.17ece.2015
Poster presented at: ECE2015 16-20 May 2015 DUBLIN, IRELAND 17th EUROPEAN CONGRESS OF ENDOCRINOLOGY