SAFETY OF PRESCRIBING FOR INPATIENTS WITH CRANIAL DIABETES INSIPIDUS (CDI): A SOUTHWEST PENINSULA AUDIT

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Introduction

Arginine vasopressin (AVP) is a hormone released from the posterior lobe of the pituitary gland that plays a significant role in water and electrolyte balance[1]. Cranial diabetes insipidus (CDI) is a condition associated with AVP deficiency resulting in significant diuresis. This manifests as electrolyte imbalance that can be potentially fatal especially if there is an abnormal thirst response[2]. Desmopressin (DDAVP) is a synthetic form of AVP that is given in CDI to ensure adequate fluid balance.

A recent UK survey of Endocrinologists reported 55% had concerns about knowledge of CDI in their trusts, 39% felt they had observed patients come to harm[3]. Patients not receiving desmopressin have been associated with death, leading to an NHS England (NHSE) safety alert in February 2016[4].

Methods

We retrospectively audited inpatients with CDI in 4 South West hospitals (Exeter, Plymouth, Torbay and Truro). We investigated desmopressin prescribing/administration and intravenous (IV) fluid monitoring before and after the NHSE safety alert (Jan 2015-16 and March 2016-17) and the impact on readmission.

Data sources included prescription and fluid balance charts, discharge summaries, laboratory results and patient medical records. Data related to patient characteristics was presented in mean and percentages.

Cohort

32 hospital admissions (26 patients) were studied (mean age 47 years, mean duration of CDI 9.6 years, 62% female). One additional patient with CDI, who had 32 unrelated individual admissions, was excluded as this significantly skewed the results. Admissions were 84% emergency and 16% planned.

Results

The admission sodium ranged between 112-153mmol/L (Normal laboratory reference 135-145mmol/L). There was one patient who was responsive to voice on admission, the others were alert and able to take tablets orally.

20% were hyponatremic on admission, half of whom received their desmopressin. One patient with significant hyponatremia (sodium 112mmol/L) had prompt specialist input with excellent monitoring of fluid balance and electrolytes.

50% of patients were also on hydrocortisone; however, this did not influence receiving DDAVP.

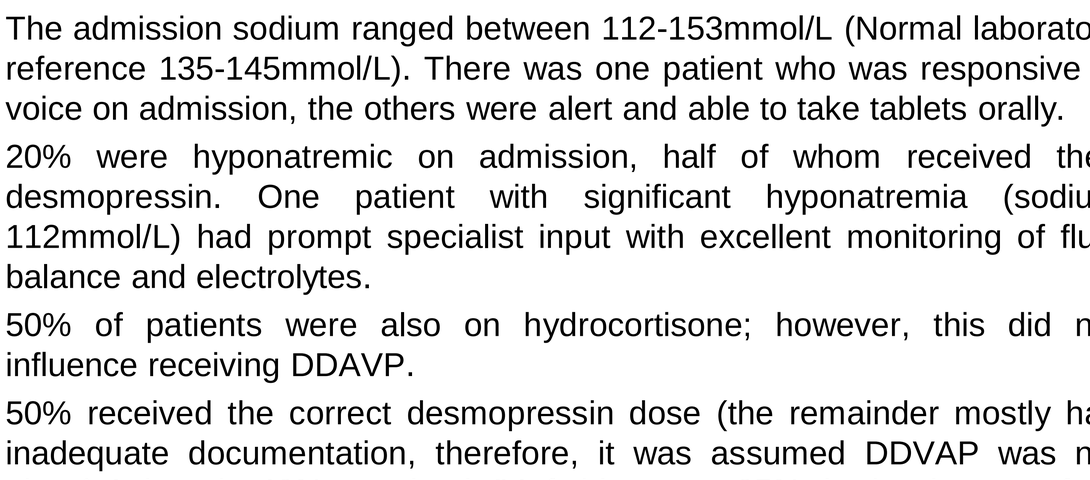
50% received the correct desmopressin dose (the remainder mostly had inadequate documentation, therefore, it was assumed DDVAP was not given).Although 40% received IV fluids, only 25% had adequate fluid balance charts.

20% had a documented endocrinology review and 47% had a repeat sodium check within 24 hours of admission.

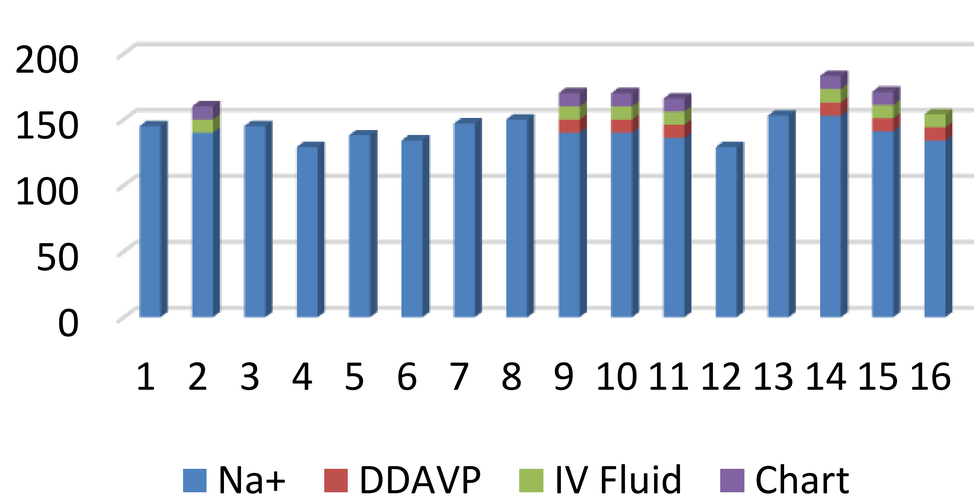
3 patients were readmitted within 30 days (unrelated to CDI).

There was improvement in monitoring of fluid balance in patients on IV fluids after the NHSE Safety alert no clear differences amongst hospitals (Figure).

Pre-NHSE Safety Alert



Post-NHSE Safety Alert



Discussion

The society for endocrinology advises that all patients with CDI should be identified on admission and specialist teams be involved in their care[5]. It goes further stating that patients on IV fluids must have sodium monitoring at least every 24hrs with fluid balance documented.

This audit shows that endocrinology input in CDI inpatients can be improved on as there was generally inadequate monitoring of fluid balance and electrolytes. Despite almost half of the patients receiving IV fluids during their admission, only 20% had documented fluid balance charts. It is assumed that if there was no documentation, then it probably was not done. This appeared to improve following the NHSE safety alert but there still were deficiencies.There were also some patients that received DDAVP despite being mildly hyponatremic at presentation, it is unclear if this was the right thing to do as documentation for the rational was inadequate. Furthermore, being on hydrocortisone did not improve the possibility of receiving the appropriate desmopressin dose. Overall, there was no impact on re-admission of patients.

It should be noted that when a CDI patient is admitted with significant fluid and electrolyte imbalance, specialist teams are promptly involved and good clinical practice is instituted. Based on the endocrine society guidelines, not only unwell patients need specialist input. The endocrinology or appropriate clinical team should be informed of all hospital admissions of CDI patients.

Conclusion

There is need for improved documentation in patient's medical records as well as fluid balance charts. CDI patients should be promptly identified when admitted and the need for specialist input should be reviewed.

Also, electrolytes of CDI patients should be regularly monitored every 24hrs even if patients are not unwell.

Finally, although the NHSE safety alert appeared to improve some aspects of healthcare, medical and nursing personnel would benefit from education on managing CDI patients when admitted to hospital.

References

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