HETEROGENOUS PATTERNS OF RECOVERY FROM ADIPSIC DIABETES INSIPIDUS IN ADULT PATIENTS

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INTRODUCTION

The natural history of adipsic diabetes insipidus (ADI) is not completely understood. Isolated case reports suggest occasional recovery of adipsia. We present the follow up of a cohort of 12 patients with ADI.

DESIGN AND METHODS

The diagnosis of ADI was confirmed by demonstrating subnormal vasopressin and thirst response to hypertonic saline infusion. 5% sodium chloride solution was infused intravenously for two hours at rate of 0.05 ml/kg/minute. Blood for the measurement of plasma sodium, osmolality and vasopressin was collected at 30-minute intervals and thirst response was measured using a visual analog scale[1]. At completion of the infusion, patients were allowed free access to water for 30 minutes, during which thirst response and volume of water consumed were measured.

RESULTS

Study cohort comprised of 12 patients: craniopharyngioma (n=5), anterior communicating artery aneurysm repair (n=4), neurosarcoidosis (n=1), prolactinoma (n=1) and congenital brain malformation (n=1). During follow up three patients died, six patients had persistent ADI, while three recovered (verified by formal testing). As the pattern of recovery was different in each case, their case histories are presented.

CASE 1

A 51-year-old gentleman developed ADI following clipping of an anterior communicating artery aneurysm. On the fourth day post procedure, at which time he was tolerating oral fluids, his plasma sodium rose to a peak of 168 mmol/L, with a plasma osmolality of 351 mOsm/kg and urine osmolality of 185 mOsm/kg,. Despite being clinically dehydrated, he did not complain of thirst. He was commenced on desmopressin and sliding fluid scale following confirmation with hypertonic saline infusion test. 10 years post surgery; he sensed the return of thirst and a repeat hypertonic saline infusion confirmed almost complete recovery of osmoregulated thirst and complete recovery of AVP secretion (fig. B). He is asymptomatic off desmopressin.

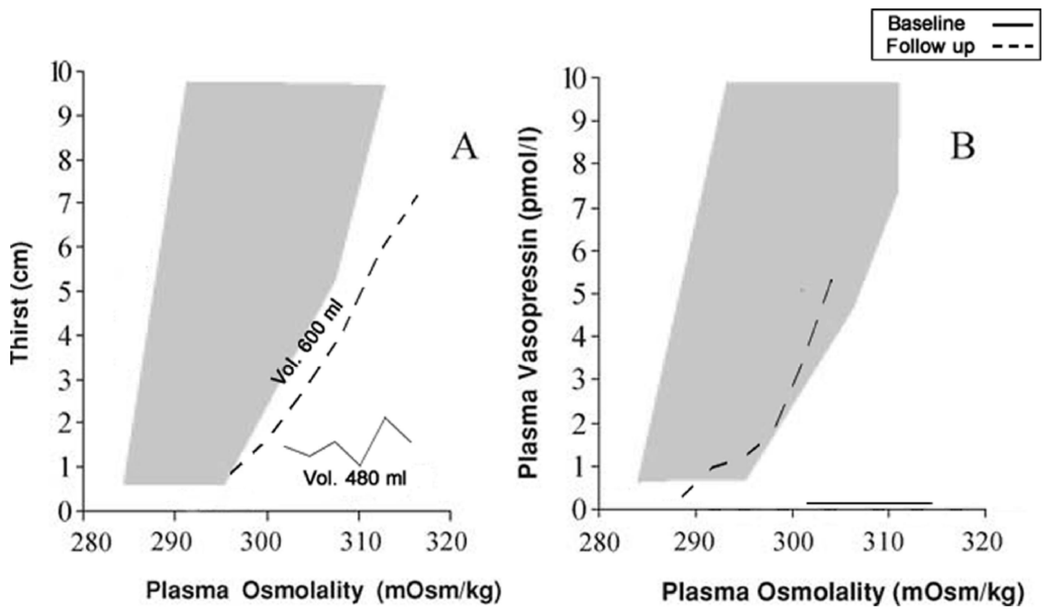

Figure 1. Thirst (A) and plasma vasopressin responses (B) to increased plasma osmolality during hypertonic saline infusion. The shaded area represents the range of responses from a locally derived reference range obtained from 40 healthy controls [1]. Vol: Volume of water consumed during the 30 minute phase after hypertonic saline infusion.

CASE 2

A 41-year-old female with an intrasellar craniopharyngioma developed postoperative ADI with persistent hypernatremia (147-172 mmol/l). Two years later, she complained of thirst. Repeat testing showed persistent deficiency of AVP but a return of thirst responses, with appropriate water drinking after the infusion(Fig. A). Case 2 describes almost complete recovery of osmoregulated thirst but persistent AVP deficiency.

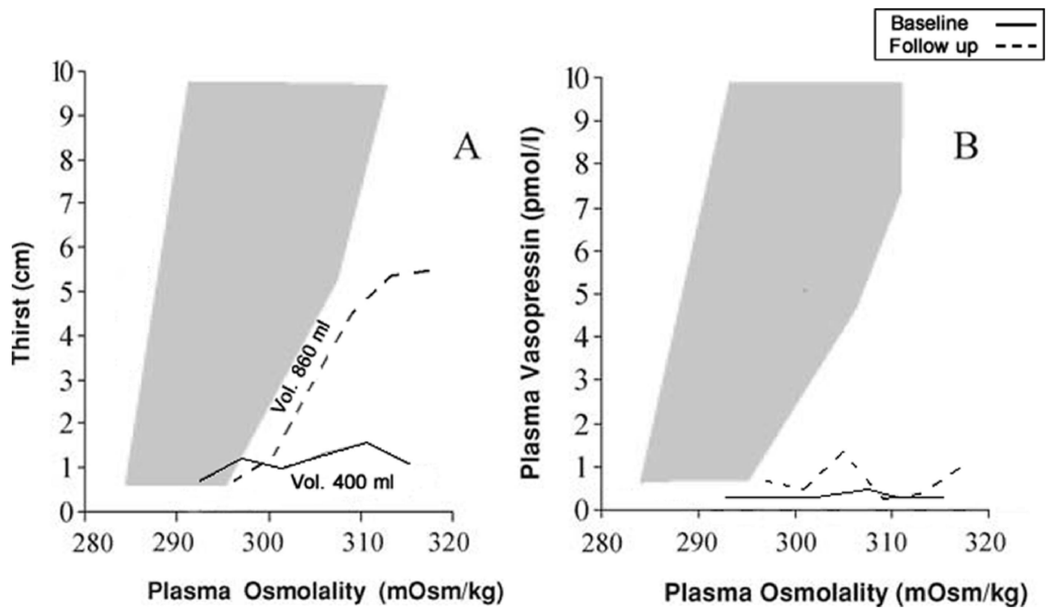

Figure 2. Thirst (A) and plasma vasopressin responses (B) to increased plasma osmolality during hypertonic saline infusion. The shaded area represents the range of responses from a locally derived reference range obtained from 40 healthy controls [1]. Vol: Volume of water consumed during the 30 minute phase after hypertonic saline infusion.

CASE 3

A 29-year-old female developed ADI following craniotomy and radiotherapy for craniopharyngioma. She required frequent admissions for hypernatraemic dehydration secondary to ADI. Eight years later, she presented with thirst, seizures and pNa of 112 mmol/l. MRI revealed a nodular rim enhancing mass in the suprasellar cistern, measuring 13 mm (anteroposterior) extending along the hypothalamus and floor of the third ventricle. Hypertonic saline infusion showed persistent complete vasopressin deficiency, but exaggerated thirst responses and failure to suppress thirst despite excess water intake in 30 minutes after the infusion, which is a classical combination of responses typical of compulsive water drinking. She has had recurrent hyponatraemia since then.

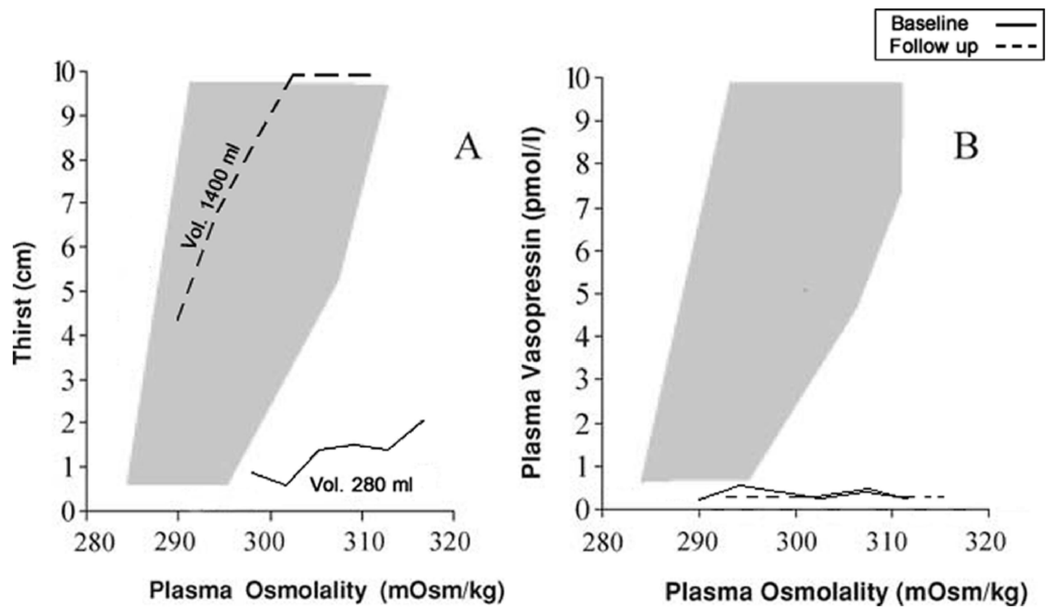

Figure 3. Thirst (A) and plasma vasopressin responses (B) to increased plasma osmolality during hypertonic saline infusion. The shaded area represents the range of responses from a locally derived reference range obtained from 40 healthy controls [1]. Vol: Volume of water consumed during the 30 minute phase after hypertonic saline infusion.

CONCLUSION

We report that 3/12 patients with ADI recovered thirst after longstanding adipsia.

The pattern of recovery was heterogeneous and included almost complete recovery of ADI, recovery of adipsia only and conversion of adipsia to polydipsia.

Both the mortality of 25% and the recovery rate of 25% should be considered during long term surveillance.

Reference 1: Thompson CJ. Polyuric states in man. *Baillieres Clin Endocrinol Metab* 1989;**3**:473-97.

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