



# **RECURRENT SEVERE HYPONATREMIA**

Portuguese Clinical Case Presentation  
Saas-Fee, Switzerland, 2011

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# Clinical Case

85 years-old caucasian male

## EMERGENCY DEPARTMENT:

- 25/Aug/2010
- Hyponatremia (Na-112 mmol/l) in routine lab tests

## MAIN COMPLAINTS:

- Fatigue
- Anorexia
- Unintentional weight loss

# Clinical Case

## PAST MEDICAL HISTORY:

- Hypertension
- Benign prostatic hypertrophy
- Hyperlipidemia
- Leukocytopenia, anemia
- Pace-maker (Mobitz II)

## MEDICATION:

- Enalapril 5 mg qd
- Simvastatin 20 mg qd
- Tamsulosin 0,4 mg qd
- Vitamins
- No over-the-counter medication

## HOSPITAL ADMISSIONS:

**2007**

- Feb
- Apr

Na: 110 mmol/l, diarrhea  
Na: 117 mmol/l, ?

**2008**

- Feb

Na: 116 mmol/l, thiazide stopped

**2009**

- Sep

Na: 113 mmol/l, urinary retention

**2010**

- Aug

Na: 116 mmol/l, congestive heart failure?

# Clinical Case

## PHYSICAL EXAMINATION:

- BP: 123/54 mmHg, HR: 61/min, RR: 13/min, T: 36,2°C
- W: 72,5 Kg, h: 1,72 m, BMI: 24,51 Kg/m<sup>2</sup>
- No skin rashes
- No hairs: limbs, pubis, trunk, axillas; few beard hairs
- No palpable thyroid
- Cardio-respiratory examination: normal
- Gynecomastia
- Abdomen: normal
- No palpable lymph nodes
- No oedemas
- Neurological examination: normal

# Clinical Case

## LABORATORY FINDINGS AT ED:

	25/Aug/2010
BUN (mg/dl) (8-21)	10
Creatinin (mg/dl) (0,7-1,2)	0,64
Na+ (mmol/l) (136-146)	112
K+ (mmol/l) (3,5-5,0)	3,0
Cl- (mmol/l) (101-109)	82
Ca++ (mg/dl) (8,8-10,6)	7,8
Osmol (mOsm/Kg) (260-302)	227
Glucose (mg/dl) (60-109)	85
Proteins (g/dl) (6,6-8,3)	6,2
Albumin (g/dl) (3,5-5,2)	3,4

	25/Aug/2010
Leukocytes ( $10^3/\mu\text{l}$ ) (5-13)	3,5
Erythrocytes ( $10^6/\mu\text{l}$ ) (4,5-6,5)	3,69
Haemoglobin (g/dl) (11,5-15,5)	10,8
Haematocrit (%) (40-54)	30,9
MCV (fl) (76-96)	88,4
MCH (pg) (27-32)	31,3
MCHC (g/dl) (32,5-35,6)	35,4
Platelets ( $10^3/\mu\text{l}$ ) (150-400)	137

# Clinical Case

## PROBLEM LIST:

- Fatigue, anorexia, unintentional weight loss
- No hairs: limbs, pubis, trunk, axillas; few beard hairs
- Gynecomastia
- Hypoosmolal hyponatremia
- Pan-cytopenia

# Clinical Case

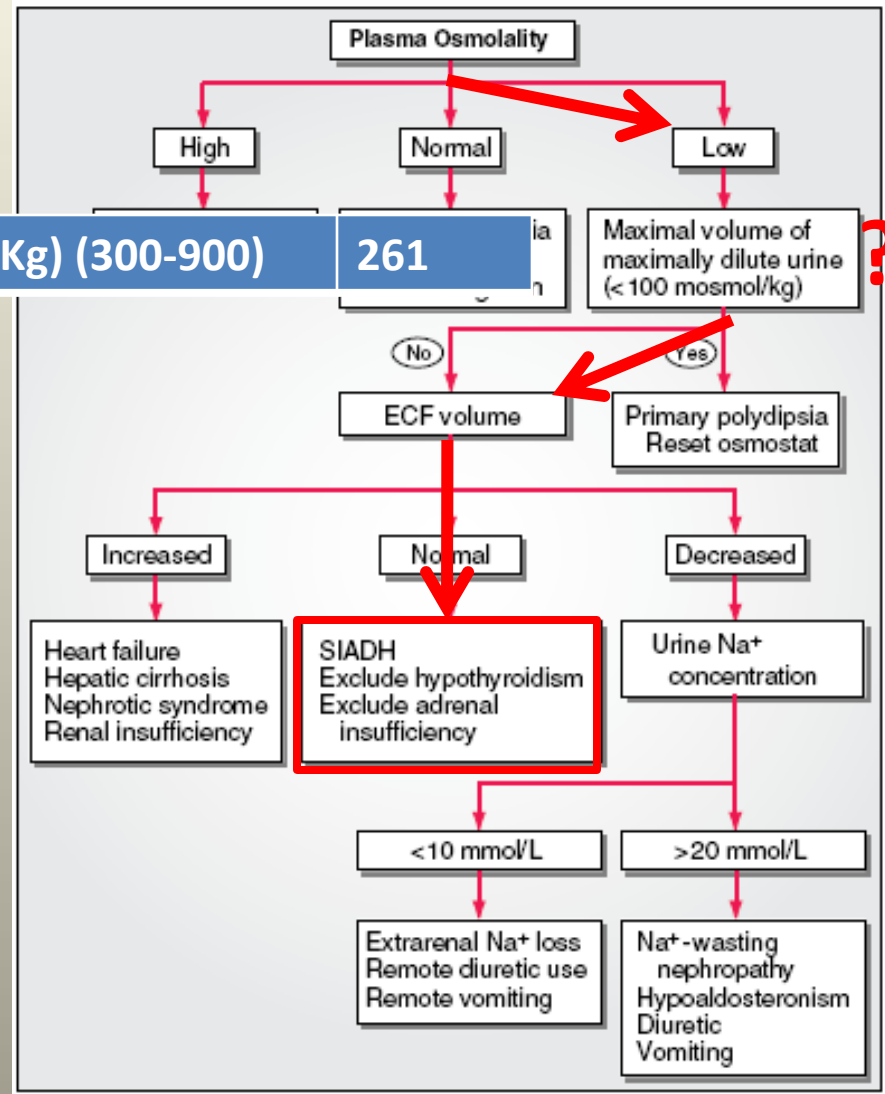
## WHAT TO THINK?

TABLE 41-2 Causes of Hyponatremia

- I. Pseudohyponatremia
  - A. Normal plasma osmolality
    - 1. Hyperlipidemia
    - 2. Hyperproteinemia
    - 3. Posttransurethral resection of prostate/bladder tumor
  - B. Increased plasma osmolality
    - 1. Hyperglycemia
    - 2. Mannitol
- II. Hypoosmolal hyponatremia
  - A. Primary Na<sup>+</sup> loss (secondary water gain)
    - 1. Integumentary loss: sweating, burns
    - 2. Gastrointestinal loss: vomiting, tube drainage, fistula, obstruction, diarrhea
    - 3. Renal loss: diuretics, osmotic diuresis, hypoaldosteronism, salt-wasting nephropathy, postobstructive diuresis, nonoliguric acute tubular necrosis
  - B. Primary water gain (secondary Na<sup>+</sup> loss)
    - 1. Primary polydipsia
    - 2. Decreased solute intake (e.g., beer potomania)
    - 3. AVP release due to pain, nausea, drugs
    - 4. Syndrome of inappropriate AVP secretion
    - 5. Glucocorticoid deficiency
    - 6. Hypothyroidism
    - 7. Chronic renal insufficiency
  - C. Primary Na<sup>+</sup> gain (exceeded by secondary water gain)
    - 1. Heart failure
    - 2. Hepatic cirrhosis
    - 3. Nephrotic syndrome

Urinary Osmolality (mOSm/Kg) (300-900)

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# Clinical Case

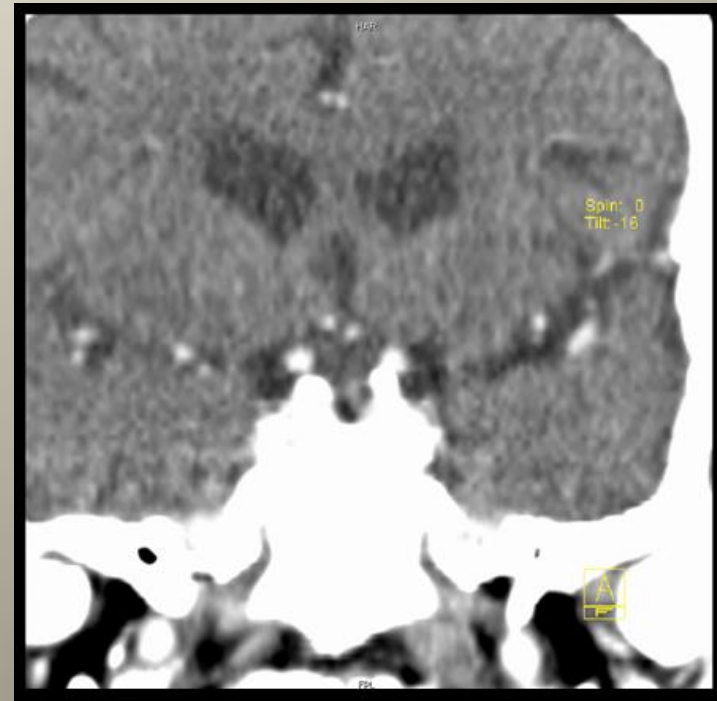
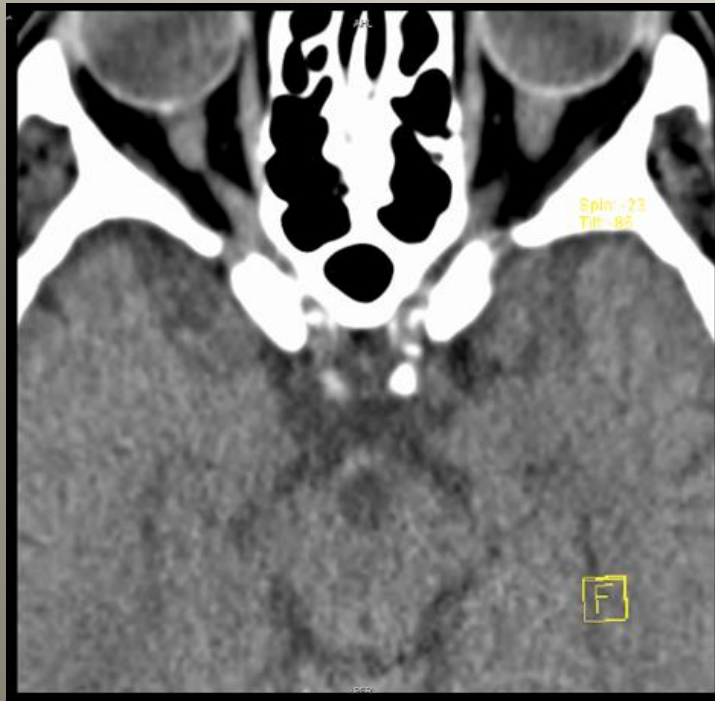
## LABORATORY FINDINGS:

	27/Aug/2010 – 9h	30/Aug/10 – 9h
FSH (mUI/ml) (< 15)		0,3
LH (mUI/ml) (<9)		<0,1
PRL (ng/ml) (<18)		7
Total Test. (ng/ml) (2,7-11)		< 0,1
ACTH (pg/ml) (9-52)	11	
Serum cortisol (µg/dl) (5-25)	6,2	
Urinary cortisol (µg/24h) (10-80)	20	
GH (µg/dl) (<1)		0,1
IGF1 (ng/ml) (81-225)		<25
TSH (µUI/ml) (0,4-4)	1,3	
Free T4 (ng/ml) (0,8-1,9)	0,5	



# Clinical Case

HEAD CT SCAN:



# Clinical Case

DIAGNOSIS:

**HYPOPITUITARISM**

WHAT CAUSED?

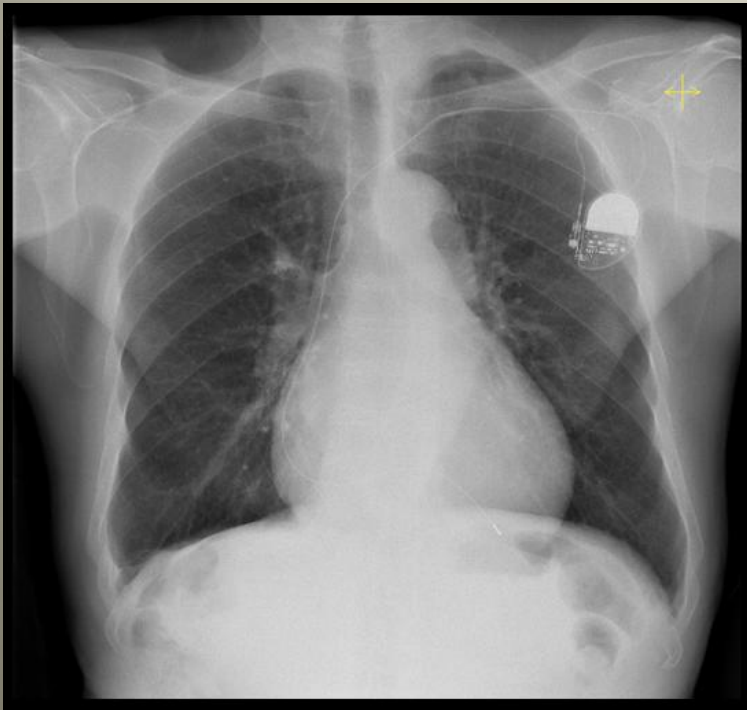


TABLE 318-2 Etiology of Hypopituitarism\*

Development/structural
Transcription factor defect
Pituitary dysplasia/aplasia
Congenital CNS mass, encephalocele
Primary empty sella
Congenital hypothalamic disorders (septo-optic dysplasia, Prader-Willi syndrome, Laurence-Moon-Biedl syndrome, Kallmann syndrome)
Traumatic
Surgical resection
Radiation damage
Head injuries
Neoplastic
Pituitary adenoma
Parasellar mass (meningioma, germinoma, ependymoma, glioma)
Rathke's cyst
Craniopharyngioma
Hypothalamic hamartoma, gangliocytoma
Pituitary metastases (breast, lung, colon carcinoma)
Lymphoma and leukemia
Meningioma
Infiltrative/inflammatory
Hemochromatosis
Lymphocytic hypophysitis
Sarcoidosis
Histiocytosis X
Granulomatous hypophysitis
Vascular
Pituitary apoplexy
Pregnancy-related (infarction with diabetes; postpartum necrosis)
Sickle cell disease
Arteritis
Infections
Fungal (histoplasmosis)
Parasitic (toxoplasmosis)
Tuberculosis
<i>Pneumocystis carinii</i>

# Clinical Case

## TREATMENT:

- Hydrocortisone:  
10 mg waking + 10 mg early evening
  
- Levothyroxin:  
0,075 mg qd (one week later)
  
- Increased dietary salt:  
1 g (teaspoons) bid

# Clinical Case

## EVOLUTION:

- Increased daily activities, appetite and weight

	25/Aug	8/Sep	13/Sep	6/Oct	11/Nov
Na <sup>+</sup> (mmol/l) (136-146)	112	124	132	138	142
K <sup>+</sup> (mmol/l) (3,5-5,0)	3,0	2,7	4,3	4,2	4,3
Cl <sup>-</sup> (mmol/l) (101-109)	82	82	101	101	103
Ca <sup>++</sup> (mg/dl) (8,8-10,6)	7,8	9,1	8,9	9,1	9,0
Osmol (mOsm/Kg) (260-302)	227	251	280	288	283
Leukocytes (10 <sup>3</sup> /μl) (5-13)	3,5	4,4	5,3	6,4	5,2
Haemoglobin (g/dl) (11,5-15,5)	10,8	11,8	11,3	11,5	11,2
Platelets (10 <sup>3</sup> /μl) (150-400)	137	134	198	136	161
TSH (μUI/ml) (0,4-4)	1,3				
Free T4 (ng/ml) (0,8-1,9)	0,5			1,4	1,7

# Clinical Case

## DIAGNOSIS:

# HYPOPITUITARISM

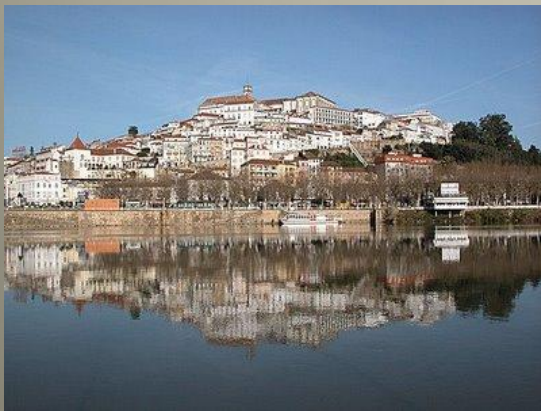
## LEARNING POINTS:

- Hyponatremia is a problem, not a disease
- Multiple causes, clinical algorithms are useful!
- Hypopituitarism is a disease, what cause?
- Treatment: surgical/replacement therapy, ...
- Replacement therapy is effective; greatly increases QOL !!!



# OBRIGADO

*(THANK YOU)*



COIMBRA - PORTUGAL