

ESIM - Clinical Case Presentation



Metabolic acidosis in a female with diabetes mellitus

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53-year-old female

- **asthenia**
- **polyuria – polydipsia for 2 weeks**
- **weight loss: 4kg/10days**

- **chronic alcohol consumption: ca 190g alcohol/day**

- **diabetes mellitus type 2 with insulin resistance;**
bad chronic metabolic control due to nonadherence
- arterial hypertension
- dyslipidemia

- gliclazide – bisoprolol – rosuvastatine – levothyroxine –
acetylsalicylic acid

- alert and lucid, euvolemic
- blood pressure 138/81mmHg - heart rate 64/’
- **tachypnoea:** respiratory rate 18/’
- normal thoracic and abdominal examination

Lab results

Arterial blood gas: 7.34/34/97/18/18/-7.3/95

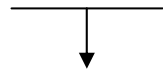
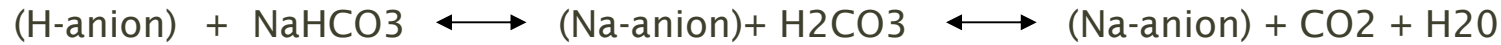
glycemia	381 mg/dl	(70 - 100)
creatinine	0.78 mg/dl	(0.4 - 1.2)
BUN	27 mg/dl	(15 - 40)
Na +	140 mEq/l	(137 - 145)
K+	4.1 mEq/l	(3.6 - 5.0)
Cl-	100 mEq/l	(101 - 111)
HCO₃⁻	16 mEq/l	(22 - 31)
<u>anion gap</u>	28 mEq/l	(10 - 18)
lactate	1.7 mmol/l	(<2.2 mmol/l)

Normal hematogram

Normal coagulation tests

Normal inflammatory tests

Raised anion gap metabolic acidosis



H: pH decreases

Unmeasured anion: anion gap (cations - anions) increases

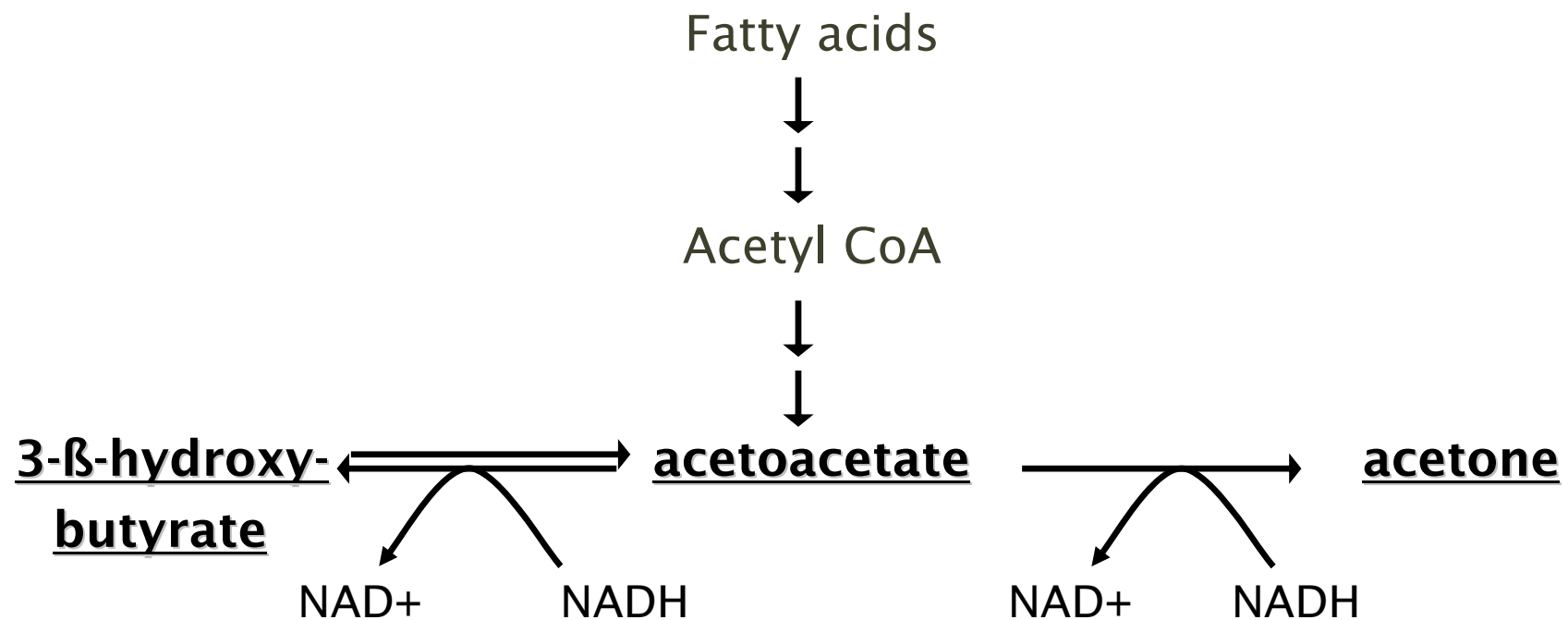
Exogenous anions:

- ~~Methanol~~
- ~~Ethylene glycol~~
- ~~Acetylsalicylic acid~~
- ~~Toluene~~

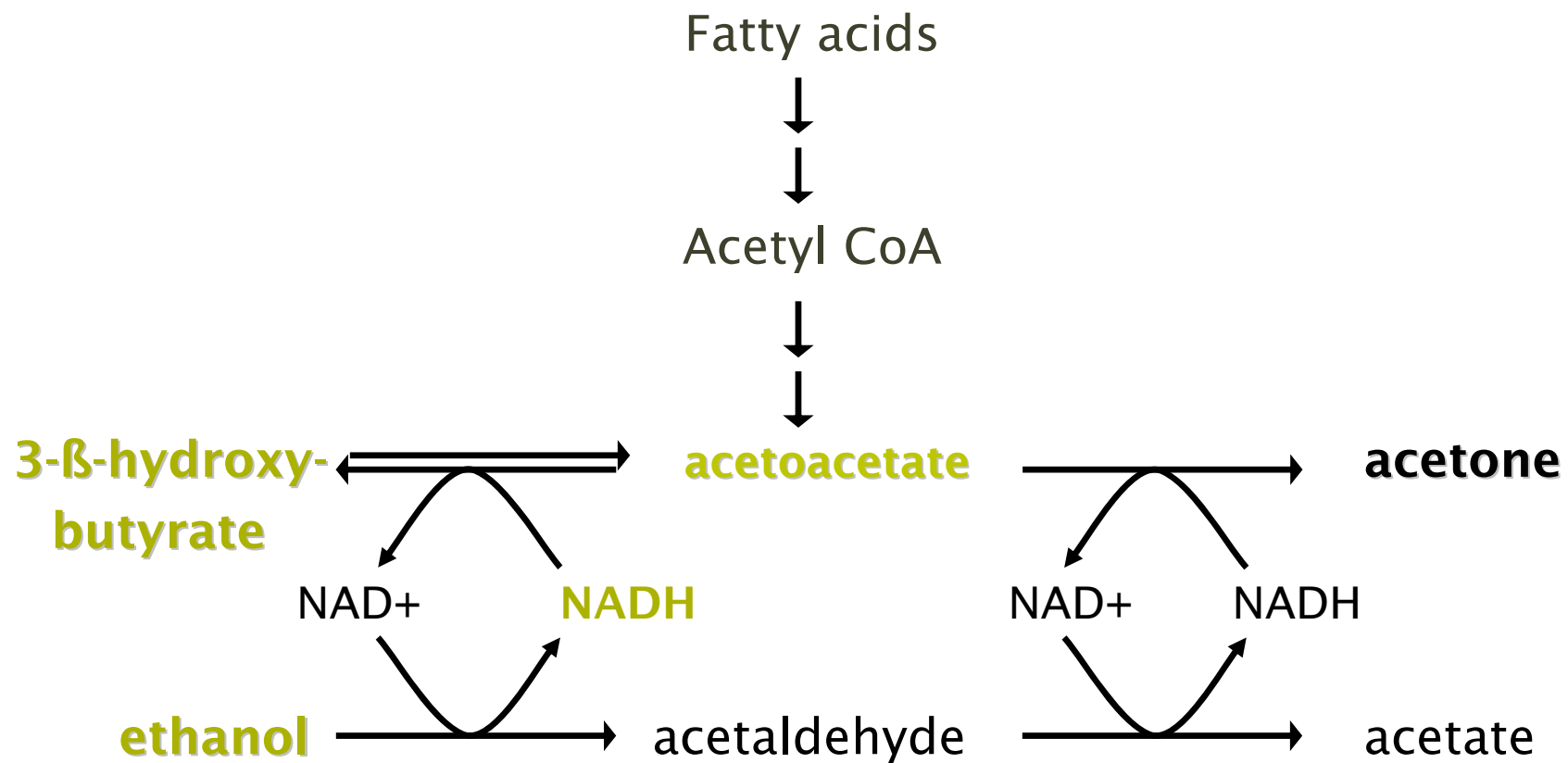
Endogenous anions:

- ~~Lactate~~
- ~~Uremia~~
- Ketones
 - ~~Diabetes mellitus + absolute insulin deficiency~~
 - ~~Fasting~~
 - Alcohol associated

Free fatty acid metabolism



FFA metabolism and alcohol consumption



Measuring ketones

- **Urinary dipstick:**

nitroprusside reacts with acetoacetate and acetone,
NOT with 3 β hydroxybutyric acid!
Dipstick negative in our patient

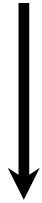
- **Serum 3- β -hydroxybutyrate:**

analysis in two samples:

- 0.59mmol/l (0-0.3) when 7.34/34/97/18/18/-7.3/95
- 0.37mmol/l after 1h30 of treatment

Diagnosis

Metabolic uncontrolled diabetes mellitus type 2



Fasting state

Chronic alcohol consumption



ALCOHOLIC KETOACIDOSIS

Immediate treatment in our patient

- **Hydromineral perfusion**: normal saline
 - supporting volume state
- Intake of **carbohydrates**
 - correction of metabolic substrate
 - correction H-imbalance glucagon – insulin
 - correction of NAD⁺/NADH ratio
 - Fluid + CH = AKA more rapidly corrected than fluid alone
- **Insulin**
 - CAVE hypoglycemia in case of glycogen depletion
- Correction of electrolyte disturbances
- Thiamine

Take home messages

Think about AKA!

- **Clinical:**
 - chronic alcohol abuse
 - nausea, vomiting, abdominal pain
 - tachypnoea, tachycardia, hypotension
 - abdominal tenderness
 - marked acidosis with minimal alteration of conscious level
- **Biochemical:**
 - high anion gap metabolic acidosis
 - blood glucose N/low
 - no urinary ketones
- **Therapeutical:**
 - rehydration
 - carbohydrates
 - electrolytes

Thank you for your attention

