

## INTRODUCTION



### Vitamin D metabolism dysfunction in burn patients

Sun exposure limitation  
Scar impaired biosynthetic function  
Ca – PTH axis abnormalities

### Pleiotropic effects of vitamin D

Vitamin D status optimization seems reasonable in burn patients

### 25OH-D measurement during acute burn care may be hazardous

Fluid shifts  
Binding proteins fluctuations leading to matrix effects with immunoassays

What about free 25OH-D (the unbound 25OH-D fraction) ?

## AIM OF THE PRESENT OBSERVATIONAL STUDY

To compare vitamin D status of healthy adults and adult burns in acute phase of burn care.

## MATERIAL AND METHODS

### BURN PATIENTS AT ADMISSION

- ° > 18y
- ° burn surface area (BSA) > 10%
- ° admitted within 24h after injury
- ° no liver or renal failure
- ° from 03/12 to 01/13

### HEALTHY ADULTS Autumn 2012



	<i>Method</i>	<i>Normal ranges</i>
<b>25OH-D (calcidiol)</b>	Liaison® (Diasorin®)	30-80 ng/ml
<b>Vitamin D binding protein (VDBP)</b>	ELISA (R&D®)	56-473 µg/ml
<b>Albumin (ALB)</b>	Cobas® (Roche®)	38-49 g/l

### **CALCULATED FREE 25OH-D (pg/ml)**

total 25OH-D / (1+ (6 x 10<sup>3</sup> x albumin) + (7 x 10<sup>8</sup> x VDBP))  
(Powe et al, JBMR 2011)

**FREE FRACTION (%) = free 25OH-D / 25OH-D**

### DATA ANALYSIS

- ° Data expressed as median (min-max)
- ° Comparisons using Mann-Whitney or unpaired t-test
- ° p<0.05 : significant

## RESULTS

**24**  
Burn patients

<i>Demographic data</i>	<i>Burn patients</i>	<i>Healthy adults</i>
<b>Age (y)</b>	46 (19-86)	26 (22-60)
<b>BMI (kg/m<sup>2</sup>)</b>	24.5(19.4-34.5)	23.5(17.4-32.9)
<b>Burn surface area (BSA) (%)</b>	15 (10-85)	N.A.
<b>Time between injury and blood sample collection (h)</b>	6 (1-16)	N.A.

**29**  
Healthy adults

<i>Vitamin D Status</i>	<i>Burn patients</i>	<i>Healthy adults</i>	<i>P value</i>
<b>ALB (g/l)</b>	36 (20-47)	49 (44-90)	< 0.0001
<b>VDBP (mg/l)</b>	221.3 (89.3-319.9)	253.6 (63-691)	0.0269
<b>25OH-D (ng/ml)</b>	13.5 (6-42)	19.8 (7.8-35)	0.0176
<b>Calculated free 25OH-D (pg/ml)</b>	4.88 (2.1-16.45)	5.65 (2.44-21.91)	<b>0.5723</b>
<b>Free fraction (%)</b>	0.033 (0.023-0.07)	0.028 (0.011-0.08)	0.0413

## CONCLUSIONS

- ➔ Based on a single immunoassay during fluid resuscitation, 25OH-D levels would suggest that hypovitaminosis D was more pronounced in our burn adults than healthy ones while **calculated free 25OH-D levels were similar.**
- ➔ Free 25OH-D can be calculated using specific formula but they suffer from generalization regarding VDBP affinity . **Ideally it should be measured** but such assay is still a technical challenge.
- ➔ **To date, assessment of vitamin D status during critical care remains hazardous.**