Endocrine disease

A168 - Central venous-arterial pCO2 difference to arterio-venous oxygen content difference ratio, pcv-acv/O2, in patients with metformin associated lactic acidosis (mala): a marker of anaerobic metabolism?

A Casazza 1; E Bellazzi 2; D Ciprandi 2; R Preda 2; R Vanzino 2; L Carnevale 2
1ASST Pavia, Anaesthesia and Intensive Care Vigevano, Vigevano, Italy, 2ASST Pavia, Vigevano, Italy

Introduction:
A growing interest exists about CO2 derived parameters in shock management. Central venous-arterial pCO2 difference (pcv-a CO2) is strictly related to cardiac output; central venous-arterial pCO2 difference to arterial-central venous O2 content difference ratio, pcv-acv CO2/CcvO2, has been proposed as anaerobic metabolism when it’s >1.4 mmHg/ml[1].

Methods:
To evaluate pcv-acv CO2/CcvO2 reliability in detecting anaerobic metabolism, we analyzed it in 7 consecutive patients affected by MALA admitted to our ICU, considering these patients as a prevalent anaerobic metabolism model. We calculated, by Douglas formula, central venous-arterial CO2 content difference to arterial-central venous O2 content difference ratio, Ccv−Cav CO2/CcvO2, as a Respiratory Quotient surrogate.
We performed arterial and central venous blood gas analysis simultaneously at admission, we calculated pcv-acv CO2, pcv-acv CO2/CcvO2 and Ccv−Cav CO2/CcvO2 and we recorded ScvO2. We verified relationship between pcv-acv CO2/CcvO2 and ScvO2 and arterial pH, arterial lactates, SOFA score at admission and Ccv−Cav CO2/CcvO2 by linear regression analysis.

Results:
pcv-acv CO2/CcvO2 greatly increases in MALA (2.16 ± 0.84). pcv-acv CO2/CcvO2 (fig.1) shows significant co-variation with pH (R2=0.618; p=0.003) and SOFA score at admission (R2=0.628; p=0.003). pcv-acv CO2/CcvO2 has poor agreement with Ccv−Cav CO2/CcvO2 (R2=0.008) and disagrees with it in identifying anaerobic metabolism, in our series, in fact, Ccv−Cav CO2/CcvO2 is, in 3 patients, < 1 like an aerobic RQ value.

pcv-acv CO2/CcvO2 shows better agreement with pH, SOFA score and lactate level than ScvO2.

Conclusion:
In our series, pcv-acv CO2/CcvO2 is good illness and acidosis severity marker, but it seems to be affected by pH value in accord with Haldane effect [2]. pcv-acv CO2/CcvO2, in our study, doesn’t seem to be a reliable anaerobic metabolism marker nor a RQ surrogate.

References:

Image:
Fig. 1

$\frac{p_{cv-a} CO2}{C_{a-cv} O2}$

$pH_{art}$