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Poorer Outcome in Picu for Children With Metabolic Acidosis Disturbance.

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ABSTRACT

Objective

Design: Mortality I PICU is related to acidosis no matter is because of metabolic or respiratory disorder. Children with diseases that cause metabolic acidosis are prone to grave morbidity and mortality as well.

Setting: The study is performed I UHC Mother Teresa Pediatric Hospital PICU.

Patients 84 patients underwent to ABB in admission time and evaluated for prism score and death rate when discharged.

Main result: Low pH especially in metabolic disorder is more related to deaths. Prism score values >10 are more prone to use as a Tool for predicting outcome.

Conclusions: Children with acidosis are in greater risk compared to others.

KEYWORDS : pH, acidosis, metabolic, respiratory, children, outcome.

Text material:

Introduction*:* Mortality I PICU is related to acidosis no matter is because of metabolic or respiratory disorder. Children with diseases that cause metabolic acidosis are prone to grave morbidity and mortality as well.

Material and method:

Patients number 84. Primary metabolic disorder 54.8%, primary respiratory disorder 29.8%, normal ABB 14.3%.

51.2% males and 41.48% females, without any significant difference between them.

(χ^2=0.01 p = 0.9).

Results:

Blood gas analysis was taken in admission to 33 patients who resulted with metabolic disorder. 33 patients with metabolic acidosis were evaluated when discharged for death rate and PRISM score.

Tab 1. pH and mortality in metabolic acidosis.

ph	Deaths	
	N	%
7.36 -7.45 *(n=5)*	1	20
7.29 - 7.35 *(n=15)*	7	47
7.28 - 7.0 *(n=11)*	6	55
<7.0 *(n=2)*	2	100

$\chi^2_{\text{for linear trend}}$=121.38 p< 0.001

In metabolic acidosis lowering of pH affects significantly in outcome, decreasing the pH increases mortality. ($\chi^2_{\text{for linear trend}}$=121.38 p< 0.001).

Clinical situations leading to metabolic acidosis were : Intoxicatons, Hepatic failure, Sepsis, Hemolitic-uremic syndrome, Miocardit, Enteritis with severe dehydration, Purpura Fulminans, Diabet Mellitus, Cardiogenic Shock , etj.

Tab2. Ph and mortality in respiratory acidosis.

ph	Deaths	
	N	%
7.36 -7.45 *(n=8)*	0	0
7.29 - 7.35 *(n=6)*	1	17
7.28 - 7.0 *(n=11)*	3	27

Clinical situations more related to respiratory acidosis are: Acute Respiratory Failure from near drowning, Pneumonia, Congenital cardiopaties, Diaphragmal hernia, Pneumothorax, Severe asthma exacerbation, Intoxication from benzodiazepines, etc.

In respiratory acidosis lowering of pH affect significantly outcome, decreasing the pH increases the mortality. $\chi^2_{\text{for linear trend}}$=26.5 p< 0

Tab 3 pH and metabolic acidosis

ph	Deaths	
	N	%
7.46 - 7.55 *(n=8)*	2	25
7.56 - 7.65 *(n=3)*	0	0
>7.65 *(n=1)*	0	0

Situations that cause metabolic alkalosis are pseudo Bartter in Cystic Fibrosis, nasal-gastric sonds, diuretics, parenteral feeding, etc

Increasing the ph there is not observed an increasing in nr of deaths

We did t had any patient with respiratory alkalosis.

13 patients with normal acid-base balance all survived

Tab 4. pH values in survived and not survived patients

Sample size	65
Spearman (rho)	-0.591
Significance	P<0.0001
95% Confidence interval for rho	-0.730 deri -0.406

Noticed a moderate negative and statistically significant correlation between values of pH and mortality.

Spearman rho = -0.591, p<0.0001.

Tab 5. Prism values in metabolic acidosis.

PRISMUS	Deaths	
	N	%
<10 *(n=17)*	5	29
>10 *(n=17)*	11	65

There is noticed a strong association of prism values and the outcome OR = 4.4, 95% CI (1.04 – 18.5), P=0.04.

Patients who have values >10 have 4.4 times to die compared to patients who have values of prism <10. OR = 4.4, 95% CI (1.04 – 18.5), P=0.04

Tab 6. Prism values in respiratory acidosis

Prismus	Deaths	
	N	%
<10 *(n=22)*	1	5
>10 *(n=3)*	3	100

We noticed a strong and significant correlation between values of prism and the outcome. (rho =0.846, 95%CI (0.6 – 0.9) p<0.01)

Tab 7. Prism values in metabolic alkalosis.

Prismus	Deaths	
	N	%
<10 *(n=11)*	1	9
>10 *(n=1)*	1	100

Is noticed a moderate significant correlation between the values of prism and outcome.

(rho =0.674, 95%CI (0.1 – 0.9) p=0.02)

Prism values in normal ABB were <10. All patients survived.

Tab 8. Prism score and outcome

prismus	Deaths	
	N	%
<10 *(n=63)*	7	11
>10 *(n=21)*	12	71

OR = 20, 95% CI (5.8 – 68.4), P<0001

Patients who have values of prism score> 10 have 20 times more probability to die compared to patients with prism score<10.

(4) ***Discusions:*** Clinically the "safe" variation for pH is approximately 7.30 to 7.52,where pH is not life threatening. A pH out of this range is potentially life threatening, because of alteration of enzimatic activity and increasing irritability of myocardium, that why measures are taken in order to return the pH to normality

Low pH is related more to mortality compared to normal and even to high pH.

The value of pH as predictor of gravity of disease is established in other studies (7), (8), despite in metabolic acido ketosis, where acidosis is more tolerated (11).

Is well definished even from other studies that Prism score >10 in children is a good predictor of mortality.(3).

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