

The impact of preoperative nutritional status on clinical outcomes after pediatric cardiac surgery in Guatemala

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Background

- Malnutrition is a common cause of morbidity in children with congenital heart disease (CHD)
- Children with CHD are at an increased risk for acute and chronic malnutrition due to increased metabolic demands and diminished energy intake.⁽¹⁾
- In a cohort of hospitalized children with CHD in the United States, 33% had acute and 64% had chronic malnutrition.⁽²⁾
- Malnutrition also increases length of stay and mortality of children after open heart surgery.⁽²⁾ Guatemala, an upper-middle income country, has one of the highest rates of chronic malnutrition globally⁽³⁾
- 6th place worldwide
- 1st place in Latin America in chronic malnutrition
- 48.5% of children under the age of 5 are hungry
- 49.3% are stunted

Objective

To determine the association between preoperative nutritional status and postoperative outcome in patients undergoing surgery for CHD.

Methods

- Retrospectively reviewed all charts of patients who underwent surgery from January 2019 to December 2020
- Underweight was defined as weight for height z-score <-2
- Stunted was defined as height for age Z-score <-2
- Descriptive analyses evaluated the percent of underweight and stunted patients preoperatively
- A bivariate logistic regression model evaluated the association between underweight and stunting with the post-operative length of mechanical ventilation (MV), intensive care unit (ICU) and hospital length of stays (LOS), infection and mortality rates, and hospital stay costs

Results

Patient Demographics		Complications in underweight patient					UNDERWEIGHT	Freq	Mean <i>(SD)</i>	P-value	STUNTED	Freq	Mean	(SD)	P-value
n=187	n (%)	Compliantions		7.0		p-Value	MV (hrs)	1.56	39.74	0.20	MV (hrs)	5.24	39.74	(118.5)	≤0.001
Age, (Months) P_{25}, P_{50}, P_{75}	8.5-44-88.5	Complications	Normal >2	>Z-2	2 Total n (%)				(118.5)			5 77	A 04	(9.24)	<0.001
Vale	87 (47)	Infectious	21	A 1A	<u> 18</u> (25%)	0.05	ICU LOS (days)	2.17	4.81 (8.21)	0.09	ico Los (days)	5.77	4.01	(0.21)	20.001
RACHS-1 I II V	79 (42) 92 (49) 15(8) 1 (1)	Pulmonary	7	6	40 (23%) 13 (6%)	0.05	Hospital LOS (days)	2.88	11.18 (9.20)	0.03	Hospital LOS (days)	4.57	11.18	(9.20)	0.004
		Cardiac	38	12	50 (26%)	0.20	Cost of hospital stay (USD)	2.41	6,003 <i>(7,792)</i>	0.06	Cost of hospital stay (USD)	5.58	6,003	(7,792)	≤0.001
Underweight > Z-1 Z-1 (Risk) Z-2 (Moderate) Z-3 (Severe)	91 (48) 61 (33) 21 (11) 14 (8)	Complications in stunted patients					No. Transfusions	2.61	0.492 (0.83)	0.05	No. Transfusions	1.33	0.492	(0.83)	0.26
		Complications	Normal	>Z-2	Total n (%)	p-Value	Pediatric Index of Mortality score II	0.54	3.70 <i>(12.4)</i>	0.65	Pediatric Index of Mortality score II	2.37	3.70	(12,4)	0.07
Stunted >Z-1 Z-1 (Risk) Z-2 (Moderate) Z-3 (Severe)	61 (33) 48 (25) 44 (24) 34 (18)	Infectious	23	25	48 (25%)	0.06	Conclusions								
		Pulmonary	7	6	13 (6%)	0.64	• Among childron undergoing cordiac ourgany, underweigth and stunting were accepted with higher								
		Cardiac	24	26	50 (26%)	0.02	morbidity, mortality, and hospital costs								

Mortality

Underweight **NO. PATIENTS**

Stunted NO. PATIENTS

Normal	Z -1	Z-2	Z-3	Total	P-value
6	1	1	2	10 (5.35%)	0.2
Normal	Z -1	Z-2	Z-3	Total	P-value
1	1	2	6	10 (5.35%)	< 0.01

Outcome variables by underweight and stunted status.

- Stunted patients have greater risk of mortality and adverse outcomes after pediatric cardiac surgery
- Strategies for improving children's preoperative nutritional status in Guatemala are imperative to improve post-operative outcomes and reduce healthcare costs in an already vulnerable population with limited resources.

References

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