Curr Pediatr Res2021; 25 (6): 639-641 *ISSN 0971-9032*
www.currentpediatrics.com

Nutritional status among children with congenital heart diseases at Al-Diwaniya province.

Hulal Saleh Sahib[1*], Rahman kareem Mohsin[2]

[1]Department of Conservative Therapy, FIBMS Pediatrics, College of Dentistry-Al-Qadisiyah University, Iraq

[2]Department of Pediatrics, College of Medicine, Al-Qadisiyah University, Iraq

Abstract

Background: Congenital Heart Disease (CHD) is a disease that may have an effect on the growth of children and may result in under nutrition. The rapid growth of children during the first few years and the highest nutritional requirements make children at high risk as they are considered a critical period for future developmental ability.
Aim of the study: To demonstrate the real impact of congenital heart disease on children nutritional status. Patients and methods: All children involved in this study were diagnosed with congenital heart disease and were symptomatic, they were 48 patients, their age (1-18 months), and the study was performed during their preoperative period. The studies conducted from the first of March 2019 to the 30 of November 2019 at AL-Diwaniya city were seeking medical advice at the outpatient clinic. History, complete physical examination, investigations (blood investigations, chest X-ray, ECG, echocardiogram) were performed for all. Growth centiles for weight and height were measured for all of them. Wellcome classification were used to evaluate their nutritional status while waterlow classification we used it to demonstrate the stages of acute and chronic malnutrition.
Results: Male to female ratio was 2:1 (32 males, 16 females), 26 presented with cyanotic CHD while 22 were with non-cyanotic defects. When we evaluated patients for severe childhood under nutrition, the severely acute malnutrition ratio with wasting was 66.6% while chronic malnutrition according to growth stunting was 83.3%. Out of 48 patients, 33.3% (n=16) were diagnosed with non-odematous SCU by Well come classification, 48.8% (n=22) were underweight, none had odematous form of SCU and 20.8% (n=10) were normal.

Keywords: Nutritional, Children, Congenital heart diseases, AL-Diwaniya province.

Accepted on July 23, 2021

Introduction

Undernutrition is one of the most critical factor in increasing mortality and morbidity in children. It is adversely affects their life quality. The timely detection and proper treatment plan are crucial components in the clinical management of many conditions [1]. Children diagnosed with congenital heart disease have been discovered with variable degrees of poor nutrition [2].

Undernutrition in these patients may be linked to genetic factors, prenatal causes, inadequate intake, poor absorption and increased demand secondary to increased metabolic rate in cases of heart failure [3,4]. In developing countries, under nutrition also belongs to many other causes such as poverty, ignorance and poor family size [5]. Hence it's well-recognized that nutritional restoration is mandatory at different setting in association with their management plan [2].

Aim of the study

To demonstrate the real impact of congenital heart disease on children nutritional status.

Patients and Methods

All children involved in this study were symptomatic; they were 48 patients, their age (1-18 months) during their preoperative period. The study conducted from the first of March 2019 to the 30 of November 2019 at AL-Diwaniya city was seeking the medical advice at the outpatient clinic. History, complete physical examination, investigations (blood investigations, chest X-ray, ECG, echocardiogram) were performed for all.

Growth centiles for weight and height were measured for all of them. Wellcome classification were used to evaluate their nutritional status while waterlow classification we used it to demonstrate the stages of acute and chronic malnutrition. All children enrolled in this study were symptomatic, the evaluation done at the pre-operative period. Oral permissions were taken from all families to be involved in the study.

We ask about the age, gender, residency, birth weight, sibling with congenital heart defect. Physical examination was performed; any patient who has another cause of undernutrition was excluded from the study.

By waterlow classification we demonstrate presence of wasting and degree of it, also we report presence of stunting among our patients [6].

- Wasting (low weight for height) which suggest acute undernutrition.
- Normal: weight/height(length) >90%.
- Mild wasting: weight/height (length) 80%-90%.
- Moderate wasting: weight/height (length) 70%-80%.
- Severe wasting: weight/height (length) <70%.
- Regarding stunting (low height for age) which suggest chronic undernutrition.
- Normal: height (length)/age >95%.
- Mild stunting: height(length)/age 90%- 95%.
- Moderate stunting: height(length)/age, 85-90%.
- Severe stunting: height(length)/age, <85%.

We also enroll welcome classification to know the type of severe childhood undernutrition in which [7]:

- If body weight is 60, 80% of expected with odema it is called previously kwashiorkor (odematous severe childhood undernutrition SCU).
- If body weight is 60, 80% of expected without odema it is called underweight.
- If body weight is <60% of expected with odema it is called previously marasmic kwashiorkor (wasting with odema).
- If body weight is 60% of expected without odema it is called previously marasmus (non odematous form of severe childhood undernutrition SCU).

Results

Total number of patients involved in the study was 48. Male to female ratio was 2:1 (32 males, 16 females), 26 presented with cyanotic CHD while 22 were with non-cyanotic defects. Patient characteristics obtained by history are reported in Table 1.

Characteristics		Number (48)	Percent
Gender	Male	32	66.60%
	Female	16	33.30%
Residency	Rural	10	20.80%
	Urban	38	79.10%
irth weight	low birth weight	30	62.50%
	normal birth weight	18	37.50%
sibling with CHD	Yes	4	8.30%
	No	44	91.60%

Table 1. Patient characteristics.

When we evaluate patients for severe childhood undernutrition, the severely acute malnutrition ratio with wasting was 66.6% while chronic malnutrition according to growth stunting was 83.3%. Out of 48 patients, 33.3% (n=16) were diagnosed with non-odematous SCU by Wellcome classification, 48.8% (n=22) were underweight, none had odematous form of SCU and 20.8% (n=10) were normal. Severity and grading of undernutrition are reported in Table 2.

Classification	Total (n=48)	Cyanotic patients(26)	Non cyanotic patients (22)
Waterlow classification wasting			
Severe wasting	66.6%(32)	62.2%(18)	63.6%(14)
Moderate wasting	16.6%(8)	15.4%(4)	18.2%(4)
Mild wasting	4.2%(2)	0	9%(2)
Normal	12.5%(6)	15.4%(4)	9%(2)
Stunting			
Chronic undernutrition	83.3%(940)	92.3%(24)	72.7%(16)
Wellcome classification			
Underweight	45.8%(22)	38.5%(10)	54.5%(12)
Non-odematous SCU	33.3%(16)	46.2%(12)	18.2%(4)
Odematous SCU	0	0	0
Normal	20.8%(10)	15.4%(4)	27.2%(6)

Table 2. Severity of undernutrition by waterlow and wellcome classification.

Discussion

From the result of this study, children with cardiac malformation were mostly complaining from undernutrition and the severity of undernutrition is related to the severity of hemodynamic instability [8]. According to these, chronic undernutrition is a serious and common complain among patients with CHD and its more among cyanotic group (92.3%) compared to (72.7%) in non-cyanotic.

Hence nearly all cyanotic patients had acute undernutrition (wasting) 84.6% (69.2% of patients had severe wasting, 15.2% were presented with moderate wasting) and chronic undernutrition (stunting) 92.3%. Many comparative studies showed that stunting was more commonly seen among cyanotic group, which is compatible to our results despites that another studies show the reverse [9].

Undernutrition was also reported among non-cyanotic patients; acute undernutrition was seen more among them with various degrees of severity (90.8%) than chronic undernutrition (72.7%). Energy expenditure was reported by a study to be more among younger children 2-8 months [10]. Another study shows that symptomatic infants presented with undernutrition than asymptomatic. The same study shows that growth centiles were lower among cyanotic patients [11]. By another study, pulmonary hypertension and tissue hypoxia were determined to be a major factor affecting growth [12].

According to welcome classification, underweight patients were more commonly seen among non-cyanotic group (54.5%)

than cyanotic (38.5%) [13-18]. Marasmus (non-edematous form of SCU) was reported greatly higher among cyanotic (46.2%) than non-cyanotic (18.2%). None of our patients had edematous form of SCU which was also reported by Isezuo et al. [19-21].

Conclusion

Patients with CHD less than 18 months had various degrees of undernutrition and this was worse among cyanotic type of CHD. Hence it's obvious that this age group need special attention to lessen the severity of undernutrition and minimize their symptom to get a less morbid condition and less mortality.

References

1. Abdelseed NAH. Glycemic control and knowledge among children and adolescents with type 1 diabetes mellitus: A cross-sectional study. J Scient Res Medi Biol Scien 2021;2(1):1-9.
2. Hornby ST, Nunes QM, Hillman TE, et al. Relationships between structural and functional measures of nutritional status in a normally nourished population. Clinical Nutrition 2005;24(3):421–426.
3. Dalili M, Meraji SM, Davari, et al. Growth status of Iranian children with hemodynamically important congenital heart disease. Actamedicaieanica 2011;49(2):103-8.
4. Chen CW, Li CY, Wang JK. Growth and development of children with congenital heart disease. J Adv Nurs 2004;47(3):260-9.
5. Cape Town metropole pediatric working group: Clinical guideline CDH. Failure to thrive; an update American family physician.
6. Waterlow JC. Notes on the assessment and classification of children with protein energy malnutrition. Lancet J. 2008;302(7820):87-89.
7. Gernaat HBPE. A new classification of acute. PEM J Tropical Pediatrics. 2000;46.
8. Okoromah CAN, Ekure EN, Lesi FEA, et al. Prevalence profile predictor of malnutrition in children with CHD. Archives of Disease in Childhood 2011;96(4);354-60.
9. HASSAN BA, ALbanaa EA, Morsy SM,et al. Nutritional status in children with un operated CHD. Front Pediatr 2015;3(53).
10. Van der Kuip M, Hoos MB, Forget PP, et al. Energy expenditure in infants with congenital heart disease, including a meta-analysis. ActaPaediatr 2003;92:921–927.
11. Venugopalan P, Akinbami FO, Al-Hinai KM, et al. Malnutrition in children with congenital heart defects. Saudi Med J 2001;22(11):964–7.
12. Varan B, Tokel K, Yılmaz G. Malnutrition and growth failure in cyanotic and acyanotic congenital heart disease with and without pulmonary hypertension. Arch Dis Child 1999;81(1):49–52.
13. Sezuo KOI, Waziri UM, Sani UM, et al. Nutritional status of children with CHD at a university teaching hospital, Nigeria. Int J Trop Dis Health 2017;25(4)1-8.
14. Qasim MT, Al-Mayali HK. Investigate the relation between Baicalin effect and Gene expression of LH, FSH, and testosterone in male rats treated with Gemcitabine drug. Res J Pharm Technol 2019;30;12(9):4135-41.
15. Qasim MT, Al-Mayali HK. The immunological and protective role of Baicalin in male rats treated with chemotherapy (Gemcitabine). Int J Phys 2019;1234:012065.
16. Tahmasebi S, Qasim MT, Krivenkova MV, et al. The effects of oxygen-Ozone therapy on regulatory T-cell responses in multiple sclerosis patients. Cell Biol 2021.
17. Mousa HM, Qasim MT. Microbial infection and il-6 urine levels for pregnant women in thi-qar province. World J Pharma Res 2015;4(05):358-65.
18. Ahmed AL-Naely J, Maytham T, Qasim, et al. Transfusion of blood components in the newborn service of the hospital. Annals of RSCB 2021;952-8.
19. Zainab I, Mohammed, Maytham T, et al. Correlation of AMH and LH Levels in PCOS patients with pregnancy rate. Annals of RSCB. 2021;945-51.
20. Zerin T, Islam A, Gulnahar S, et al. Identification and antibiotic susceptibility of blood culture isolates from Rajshahi, Bangladesh. Journal of Scientific Research in Medical and Biological Sciences 2021;2(2):1-10
21. Shabgah GA, Qasim MT, Mostafavi MS, et al. CXC chemokine ligand 16: A Swiss army knife chemokine in cancer. Expert Rev Mol Med 2021;23:e4.

*Correspondence to:

Hulal Saleh Sahib

Department of Conservative Therapy

F.I.B.M.S Pediatrics

College of Dentistry-Al-Qadisiyah University

Iraq

E-mail:abujamaljameel@gmail.com