ISSN: 2572-3278

Santos et al. J Nutri Med Diet Care 2020, 6:046
DOI: 10.23937/2572-3278/1510046
Volume 6 | Issue 1
Open Access

Journal of
Nutritional Medicine and Diet Care

CASE REPORT

Nutritional Status Evaluation of a Critically Ill Patient with Chagasic Cardiopathy Treated in an Intensive Care Unit in Santo Antonio de Jesus, Bahia, Brazil: A Case Report

Adriane de Jesus Santos[1], Vanessa Gomes Santiago[1], Jamille Souza Costa Barreto[1], Simone Santos Menezes[1], Danielle Brito Alves[1], Priscilla Carvalho da Silva Ribeiro[1], Thamires Barros dos Santos[1], Bianca Sena Bitencourt[1], Naiara Santos Barreto[2], Ludmila de Cássia Ornelas dos Reis[2], Jussara Argolo Guilhardi[2], Maria Fernanda Coni Magalhães[2] and Carlos Alberto Soares da Costa[1*]

[1]Applied Nutrition Studies Group, Health and Science Center, Federal University of Reconcavo da Bahia, Brazil

[2]Brotherhood of the Holy House of Mercy, Luis Argolo Hospital and Maternity, Brazil

***Corresponding author:** *Carlos Alberto Soares da Costa, Applied Nutrition Studies Group, Health and Science Center, Federal University of Reconcavo da Bahia, Avenida Carlos Amaral, 1015, Cajueiro, 44574-490, Santo Antônio de Jesus, Bahia, Brazil, Tel: +55-(75)-3632-1724*

Abstract

Background: Malnutrition at hospital admission has negative impact on clinical outcomes such as patients' hospital length of stay, rehospitalization and death. The aim of the current study is to present a case report describing the nutritional status of a critically ill patient with chagasic heart disease who was hospitalized in the intensive care unit of a hospital in Santo Antonio de Jesus County, Bahia State.

Methods: Socioeconomic data, laboratory exams, anthropometric parameters and objective measurements such as Prognostic Nutritional Index, Nutritional Risk Index and Controlling Nutritional Status were taken of the patient in the current study is a 62-year-old with chronic Chagas' cardiomyopathy present electrocardiographic abnormalities with progressive myocardial injury, heart failure or dilated cardiomyopathy pattern when hospitalized in the intensive care unit.

Results: Laboratory exams were associated with severe cardiac impairment, decompensation and myocardial damage. Nutritional indicators, such as arm circumference, elbow width, body mass index, serum albumin, lymphocyte count, Prognostic Nutritional and Nutritional Risk Indexes and Controlling Nutritional Status showed a poor nutritional prognosis.

Conclusion: There are no formal guidelines for follow-up screening directed specifically at Chagas cardiomyopathy. The present case study corroborates the relevance of assessing plasma albumin levels, Prognostic Nutritional and Nutritional Risk Indexes and Controlling Nutritional Status to predict the poor prognosis in critically ill patient with Chagasic heart disease.

Keywords

Chagas disease, Heart disease, Nutritional status, Malnutrition, Intensive care unit

Introduction

Chagas disease (Human American trypanosomiasis) is an infection caused by protozoan parasite species *Trypanosoma cruzi*. According to estimates, approximately 10 million people worldwide are currently infected with *T. cruzi*. Chagas disease remains a major public health issue in Brazil. Approximately 2-3 million individuals are infected with this parasite and ~ 6,000 deaths are recorded on a yearly basis due to it [1]. According to a descriptive cross-sectional study (2008-2018) conducted in HEMOBA (Hematology and Hemotherapy Foundation of Bahia) database, *T. cruzi* infection recorded higher in-

Citation: Santos AJ, Santiago VG, Barreto JSC, Menezes SS, Alves DB, et al. (2020) Nutritional Status Evaluation of a Critically Ill Patient with Chagasic Cardiopathy Treated in an Intensive Care Unit in Santo Antonio de Jesus, Bahia, Brazil: A Case Report. J Nutri Med Diet Care 6:046. doi.org/10.23937/2572-3278/1510046

Accepted: October 14, 2020: **Published:** October 16, 2020

cidence in 30-year-old individuals (or older) and in individuals with up to 12-year schooling in Bahia State (Brazil) - seroprevalence was significantly higher in men [2].

More than 10,000 individuals die from chronic clinical manifestations every year, mainly from Chagasic cardiopathy, which is a dilated and arrhythmogenic cardiomyopathy whose subacute, although constant, chronic inflammatory process often leads to progressive heart tissue destruction and to extensive fibrosis [3]. Patients with chronic Chagas cardiomyopathy have shown poorer prognosis than patients with Idiopathic Dilated Cardiomyopathy. In addition, Bambuí (Minas Gerais State, Brazil) Project has observed the coexistence of chronic Chagas disease and poor nutritional status, as well as reduced fat tissue reserve and muscle mass, in elderly individuals who lived in a Chagas disease-endemic area [4].

Heart failure (HF) worsens health-related quality of life; early identification of malnutrition can enable early nutritional intervention and better clinical outcomes. Malnutrition at hospitalization time has negative impact on clinical outcomes such as patients' hospital length of stay, rehospitalization and death. Therefore, it is essential identifying the risk of cardiovascular disease development and conducting early risk stratifications to enable the effective application of risk-reduction strategies [5,6].

With no formal guidelines for follow-up screening directed specifically at Chagas cardiomyopathy [7], the aim of the current study is to present a case study describing the nutritional status of a critically ill patient with Chagasic heart disease at the time of his admission to the intensive care unit of a hospital in Santo Antonio de Jesus County, Bahia State.

Case Description

The patient in the current study is a 62-year-old African Brazilian, illiterate and retired male farmer, who does not live alone, is married, father of six children and lives with monthly income of two minimum wages. He has been a former-smoker and recovering alcoholic for fifteen years and reported to not exercise. He was admitted to the Emergency Care Unit of a hospital in Maragogipe County, Bahia State, due to heart failure resulting from dilated cardiomyopathy of dilated Chagasic etiology. He complained about having respiratory distress and anasarca for two weeks, which had progressively worsened despite the use of medication. He presented paleness, chest pain, lucidity, orientation in time and space, dyspnea, lack of fever, hypotension, spontaneous diuresis, normal dejections and lack of appetite. Electrocardiogram has shown dilated cardiomyopathy with enlarged left ventricle, left ventricular ejection fraction (LVEF by Simpson's rule 31%); diffuse hypokinesia, pseudonormal diastolic dysfunction of the left ventricle, slightly increased cardiac cameras, mild systolic dysfunction in the right ventricle, mild mitral regurgitation and mild pulmonary hypertension.

The patient was hospitalized in the intensive care unit of a hospital in Santo Antonio de Jesus County, Bahia State on December 05th, 2019. Although he was oriented in time and space, he presented moderate respiratory distress, dyspnea at rest and anasarca. He was diagnosed with congestive heart failure, acute pulmonary edema and renal dysfunction. On December 06th, 2019, he was invited to participate in the project "study on the prevalence of malnutrition in cardiopathic patients admitted in hospital located in Santo Antônio de Jesus, Bahia". The study was approved by the Ethical Committee of our institution (approval number: 97118618.2.0000.0056/2018). The participant was assessed after he signed the Informed Consent Form. Data collected to assess patient's nutritional status are described in Table 1 and Table 2.

Table 1: Admission laboratory exams.

Exams	Result	Reference*	Exams	Result	Reference*
RBC (mi/mm³)	4.92	4.5-5.5	ALT (U/L)	55.00	Up to 47
Hemoglobin (g/dL)	14.7	12.5-15.5	Total bilirubin (mg/dL)	1.62	0.2-1.0
Hematocrit (%)	44.7	40-50	Direct bilirubin (mg/dL)	0.59	0.0-0.2
MCV (μ³)	90.9	81-99	indirect bilirubin (mg/dL)	1.03	0.2-0.8
MCH (μμg)	29.9	23-33	CT (ng/mL)	Non-reactive	< 5
MCHC (%)	32.9	31-35	PAT (%)	76.00	70-100
RDW (%)	15.9	11-14	aPTT (seg)	57.00	30-40
Leukocytes (mcL)	3.000	4.000-10.000	GGT (U/L)	226.16	< 55
Urea (mg/dL)	60.01	10-40	CK (U/L)	22.39	Up to 25
Creatinine (mg/dL)	1.19	0.4-1.3	LDH (U/L)	491.43	115-225
AST (U/L)	51.57	Up to 54	Amylase (U/L)	73.14	20-160

RBC: Red Blood Cells; MCV: Mean Corpuscular Volume; MCH: Mean Corpuscular Hemoglobin; MCHC: Mean Corpuscular Hemoglobin Concentration; RDW: Red Cell Distribution Width; AST: Aspartate Transaminase; ALT: Alanine Transaminase; CT: Cardiac Troponins; PT: Prothrombin Time; aPTT: Activated Partial Thromboplastin Time; GGT: Gamma-Glutamyl Transferase; CK: Creatine Kinase; LD: Lactate Dehydrogenase.

*Reference used by the intensive care unit service.

Table 2: Nutritional indicators, nutritional status and prognostic impact.

Parameter	Results	Status
Knee height (cm)	55.16	---
Estimated height (m)	1.73	---
Estimated weight (kg)	55.94	---
Arm circumference (cm)	25.33	Deficit risk (Percentile 5-15)
Calf circumference (cm)	36.33	Eutrophic (More than 31 cm)
Wrist circumference (cm)	18.00	Mean physique (R = 10.4-9.6)
Elbow width (cm)	6.66	Small physique (< 40.2 and < 7)
Body mass index (kg/m^2)	18.70	Low weight for age (< 22 kg/m^2)
Serum albumin (g/dL)	2.83	Moderate malnutrition (2.4-2.9 g/dL)
Lymphocyte count (mm^3)	663.0	Severe malnutrition
Total cholesterol (mg/dL)	155.61	Desirable
Prognostic Nutritional Index	31.61	High risk (PNI < 35)
Nutritional Risk Index	38.98	High risk (NRI < 83.5)
Controlling Nutritional Status	8	Moderate risk (CONUT 5-8)
APACHE II Scoring*	27	Glasgow: 15 and Mortality estimates: 70.99%

APACHE: Acute Physiology and Chronic Health Evaluation.

*Disease classification performed by the intensive care unit service.

Discussion

According to the I Latin American Guidelines for the Diagnosis and Treatment of Chagas' Heart Disease [8], many patients with chronic Chagas' cardiomyopathy present electrocardiographic abnormalities with progressive myocardial injury, heart failure or dilated cardiomyopathy pattern. The clinical description in the present report features disease between stages C (patients with left ventricular dysfunction and HF symptoms - NYHA I, II, III and IV) and D (patients with NYHA IV requiring specialized and intensive interventions). In addition, the algorithm used for risk stratification in the chronic Chagas disease stage [8] has shown high mortality risk due to abnormal electrocardiogram results. APACHE II scoring [9] and nutritional status evaluation has confirmed the severity of the case.

The patient is retired, married and does not live alone, a fact that diminishes the lack of interest in preparing meals and eating food [6]. However, he is a former smoker and recovering alcoholic. His old lifestyle, in association with his place of residence (countryside) and low socioeconomic level, can worsen Chagas disease, mainly the cardiac form of it [10].

Laboratory exams did not show anemia, although it is often diagnosed in approximately one third of congestive heart failure patients. However, higher urea, alanine transaminase, bilirubin serum concentrations, leukopenia (rare), activated partial thromboplastin time, gamma-glutamyl transferase and lactate dehydrogenase are typical of severe cardiac impairment and decompensation, hepatobiliary dysfunction, prothrombotic state and myocardial damage in chronic chagasic patients, respectively [11]. Lower lymphocyte and albumin levels have indicated likely inadequate diet, as well as higher energy requirement due to Chagas disease [10,12]. In addition, Ronit, et al. [13] have found robust independent association between low plasma albumin and cardiovascular disease, which was partly explained by plasma albumin action as negative acute-phase reactant. The present case study corroborates the relevance of assessing plasma albumin levels in critically ill patient with Chagasic heart disease.

The current study did not collect any data about patient's weight and dietary changes, as well as about his functional capacity and physical assessment. Consequently, it was not possible performing the Nutritional Risk Screening (NRS), the Subjective Global Assessment (SGA) and/or the Mini Nutritional assessment (MNA). Clear evaluation criteria, universally accepted definitions, and a gold-standard methodology for using nutritional status to predict adverse outcomes remain to be established [14]. For that reason, Prognostic Nutritional Index (PNI, based on albumin and lymphocytes), Nutritional Risk Index (NRI, based on albumin and usual body weight percentage) and Controlling Nutritional Status (CONUT, based on albumin, lymphocytes and total cholesterol) [5] were adopted in the current case study. PNI, NRI and CONUT are objective measurements used to assess the nutritional status and to predict the poor prognosis of hospitalized patients. Although not yet validated for heart failure cases resulting from dilated cardiomyopathy of Chagasic etiology, PNI, NRI and CONUT are coherent with arm circumference, elbow width, body mass index and APACHE II results to nutritional risk observed.

Conclusions

Despite the poor nutritional prognosis, the patient

in the current study was successfully treated. He was discharged from the intensive care unit and taken to the medical clinic on December 08th, 2019. Three days later, on December 11th, 2019, he was discharged from the hospital after he received medical and nutritional guidelines.

Acknowledgments

We are grateful to the staff of the intensive care unit service and healthcare administration of the Luiz Argolo Maternity Hospital for the technical support.

Sources of Support

The study was carried out with its own resources.

Author Contribution

AJS, VGS, JSCB, SSM, DBA, PCSR, TBS and BSB were responsible for extracting and interpreting results; NSB, LCOR, JAG and MFCM were responsible for screening potentially eligible patients; CASC was responsible for designing the protocol and wrote the final version of manuscript.

References

1. Arruda HMBS, Ribeiro MA, da Silva AM, Vasconcelos D, de Oliveira MRF, et al. (2019) Epidemiological features, echocardiographic findings, and parasite load in patients with Chagas disease. Rev Soc Bras Med Trop 52.
2. Miranda DLP, Ribero G Jr, Lanza FC, Santos FLN, Reis RB, et al. (2019) Seroprevalence of trypanosoma cruzi infection among blood donors in the state of Bahia, Brazil. Rev Soc Bras Med Trop 52: e20190146.
3. de Sousa RC, de Deus DB, da Costa TA, da Silva MV, Junior VR, et al. (2019) Correlation between the cytokine profile and anticongestive medication in patients with chronic Chagasic cardiopathy. Rev Soc Bras Med Trop 52.
4. dos Santos JP, Lima-Costa MF, Peixoto SV (2013) Nutritional aspects associated with chronic Trypanossoma cruzi (Chagas 1909) infection among older adults: Bambuí Project. Cad Saúde Pública 29: 1141-1148.
5. Narumi T, Arimoto T, Funayama A, Kadowaki S, Otaki Y, et al. (2013) The prognostic importance of objective nutritional indexes in patients with chronic heart failure. J Cardiol 62: 307-313.
6. Ruiz AJ, Buitrago G, Rodriguez N, Gomez G, Sulo S, et al. (2019) Clinical and economic outcomes associated with malnutrition in hospitalized patients. Clin Nutr 38: 1310-1316.
7. Hollowed J, McCullough M, Sanchez D, Traina M, Hernandez S, et al. (2016) Case report: Rapidly progressing chagas cardiomyopathy. Am J Trop Med Hyg 94: 894-896.
8. Andrade JP, Neto JAN, Paola AAV, Vilas-Boas F, Oliveira GMM, et al. (2011) I Latin American guidelines for diagnosis and treatment of chagas' heart disease. Executive summary. Arq Bras Cardiol 96: 434-442.
9. Knaus WA, Draper EA, Wagner DP, Zimmerman JE (1985) APACHE II: A severity of disease classification system. Crit Care Med 13: 818-829.
10. Geraix J, Ardisson LP, Marcondes-Machado J, Pereira PCM (2007) Clinical and nutritional profile of individuals with chagas disease. Braz J Infect Dis 11: 411-414.
11. Filho JDS, Costa AC, Freitas EC, Viana CEM, Lima MA, et al. (2017) Hematological and biochemical profile of patients with chagas disease attended by a pharmaceutical care service in the state of Ceará. J Health Biol Sci 5: 130-136.
12. Blackburn GL, BR Bistrian, BS Maini, HT Schlamm, MF Smith (1977) Nutritional and metabolic assessment of the hospitalized patient. J Prent Ent Nutr 1: 11-22.
13. Ronit A, Kirkegaard-Klitbo DM, Dohlmann TL, Lundgren J, Sabin CA, et al. (2020) Plasma albumin and incident cardiovascular disease: Results from the CGPS and an updated meta-analysis. Arterioscler Thromb Vasc Biol 40: 473-482.
14. Shirakabe A, Hata N, Kobayashi N, Okazaki H, Matsushita M, et al. (2018) The prognostic impact of malnutrition in patients with severely decompensated acute heart failure, as assessed using the prognostic nutritional index (PNI) and controlling nutritional status (CONUT) score. Heart Vessels 33: 134-144.