South African Journal of Clinical Nutrition 2019; 32(1):8-10

SAJCN
ISSN 1607-0658 EISSN 2221-1268

GUEST EDITORIAL

Diagnosis of hospital malnutrition in the adult population

Renée Blaauw
Division of Human Nutrition, Faculty of Medicine and Health Sciences, Stellenbosch University
Corresponding author: R Blaauw (rb@sun.ac.za)

It is well known that malnutrition is associated with increased morbidity (increased complications[1-3] and longer length of ICU and hospital stay[1-4]) as well as increased mortality.[1-6] Early identification and appropriate management of malnutrition on the other hand is associated with improved outcomes.[7] Nutritional status screening and assessment therefore should be performed on all patients on admission to hospital.[8,9] Those identified as malnourished or at-risk of developing malnutrition should be referred for specialised nutrition support in an attempt to correctly manage and improve nutritional status.

Various nutritional screening tools are available and recommended for use in adult hospitalised patients.[1,3,10] Since screening acts as the first step in the diagnostic process, any validated tool can be used. Those identified as at-risk of malnutrition should undergo a further full assessment for the diagnosis of malnutrition. The latter diagnosis is made using different criteria as recommended by the European Society for Clinical Nutrition and Metabolism (ESPEN),[11] The American Society for Parenteral and Enteral Nutrition (ASPEN)[12] and others. However, the different diagnostic criteria used makes it difficult to compare the results obtained from various studies and could be a contributing factor for the wide range of global malnutrition prevalence data being cited in the literature, ranging from 14–78%.[1,2,6,8,13]

In an attempt to standardise adult malnutrition diagnostic criteria, the Global Leadership Initiative on Malnutrition (GLIM), consisting of representatives of North and South America, Europe, Asia, South Africa and Australia, proposed a universal set of criteria for the diagnosis of adult malnutrition.[9] The diagnostic process proposed includes a 2-step approach, starting with screening (using any validated screening tool), followed by a detailed assessment for diagnosis and severity grading of malnutrition. This assessment consists of two sets of criteria (phenotypic and etiologic) and includes five components (Figure 1). At least one component from each of the two criteria should be present before the diagnosis of malnutrition can be made.[9]

In terms of severity, malnutrition is assessed based on the degree of deviation from certain threshold values for the phenotypic criteria. It is characterised as Stage 1 (Moderate malnutrition) if the percentage weight loss is 5–10% within the past 6 months or > 10% beyond 6 months, or if the body mass index (BMI) is < 20 kg/m² (for age group < 70

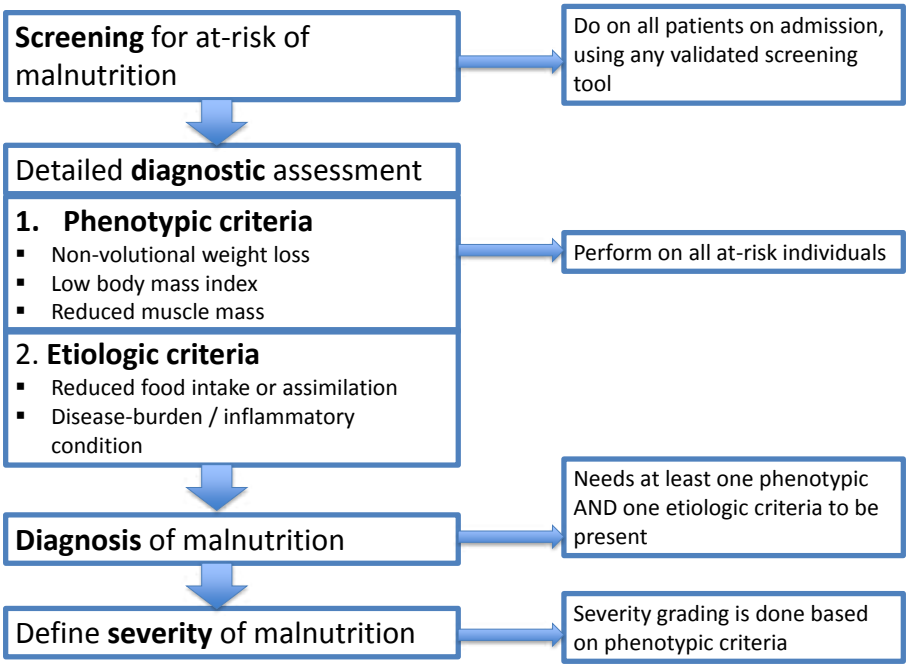

Figure 1: Global Leadership Initiative on Malnutrition (GLIM) criteria for the diagnosis of malnutrition (Adapted from[9])

years) or < 22 kg/m^2 (age group ≥ 70 years), or if a mild to moderate reduction in muscle mass is detected. Stage 2 (Severe malnutrition), on the other hand, is selected if the percentage weight loss is > 10% within the past 6 months or > 20% beyond 6 months, or if the BMI is <18.5 kg/m^2 (for age group < 70 years) or < 20 kg/m^2 (age group ≥ 70 years), or if a severe reduction in muscle mass is detected.[9]

Even though this process seems fairly simple and doable, the availability of accurate information for each of the five components in the hospital setting, especially in a resource-limited setting like South Africa, can be challenging. It assumes the availability of accurate weight measures, past and present, to determine percentage weight loss, accurate height measures together with weight for the assessment of BMI and a reliable indicator of muscle mass. For the latter, dual-energy absorptiometry (DXA) or bioelectrical impedance analysis (BIA) have been proposed.[9,14] In the absence of DXA and BIA, mid-upper arm circumference (MUAC) can be used as a proxy indicator of muscle mass and hand-grip strength can be used to indicate muscle function.[9]

An Asian study, employing the GLIM criteria within the context of the lower BMI cut-off values used for Asian populations (BMI < 17.0 kg/m^2 for < 70 year age group and BMI < 17.8 kg/m^2 for the age group ≥ 70 years), reported a prevalence of malnutrition among 4796 adult hospitalised patients of 18%.[15] A multi-centre analytical cohort study assessing data from 1287 adult hospitalised patients (excluding ICU) from South Africa, Ghana and Kenya revealed a prevalence of malnutrition on admission to hospital of 45.5% using the GLIM diagnostic criteria.[16] Other data from the African continent reporting on adult hospital malnutrition found a prevalence of malnutrition of 47.3% in Burundi[17] (diagnosed based on percentage weight loss) and 19.3% in Cameroon[18] (based on BMI and MUAC values). Little data is available on the extent of the problem in South Africa and the difference in the prevalence of malnutrition in general hospital patients versus the critically ill. However, due to different diagnostic tools being used in the past, comparison of data remains challenging.

The study by Van Tonder et al., page ** of the current SAJCN issue, assessed for the first time in the Eastern Cape Province, the prevalence of hospital malnutrition/at-risk of malnutrition in 141 adult patients in three public hospitals. They used different tools to determine prevalence of at-risk of malnutrition (MUST screening tool) and malnutrition (BMI and MUAC). The study documented a prevalence of at-high-risk of malnutrition of 48% and the malnutrition prevalence ranged from 27% (using BMI) to 45% (using pre-defined cut-off values for MUAC of < 23 cm). The latter prevalence of 45% was similar to the 48% at-high-risk of malnutrition prevalence as indicated by the MUST tool. The authors reported a strong correlation between low MUAC (< 23 cm) and low BMI (< 18.5 kg/m^2) values, and argue that low MUAC measurements can therefore be used to predict low BMI. In this regard, the authors' previous experience highlighted the difficulty in obtaining accurate weight and height measurements since BMI could not be determined in 38% of those patients and the MUST could not be scored in 43% of cases due to previous weight history not being known.[19]

The use of MUAC measurements to predict BMI category and the presence of malnutrition is novel and practical in that it is quick and easy to determine and does not rely on weight and height measurements. The current data was only obtained for the black and coloured population that participated in the study and needs to be tested in other ethnic groups and in different clinical settings. If the results of the Van Tonder study can be reproduced, not just in the Eastern Cape, but also in other parts of the country and in various clinical settings, for instance different disease conditions including the critically ill, the use of MUAC can be proposed as an accurate proxy measure of BMI. This will assist in the use of the GLIM tool, since two of the phenotypic criteria, e.g. BMI and assessment of muscle mass, will be addressed through the measurement of MUAC.

References

1. Chin C, Lew H, Hons BND, Yandell R, Fraser RJL, Chua AP, et al. Association Between Malnutrition and Clinical Outcomes in the Intensive Care Unit : A Systematic Review. JPEN J Parenter Enter Nutr. 2017;41(5):744-58.
2. Correia MI, Hegazi RA, Graf JID, Gomez-Morales G, Gutiérrez CF, Goldin MF, et al. Addressing Disease-Related Malnutrition in Healthcare : A Latin American Perspective Hospital Malnutrition in Latin America : Prevalent and Persistent. J Parenter Enter Nutr. 2016;40(3):319-25.
3. Avelino-Silva TJ, Jaluul O. Malnutrition in Hospitalized Older Patients: Management Strategies to Improve Patient Care and Clinical Outcomes. Int J Gerontol [Internet]. 2017;11(2):56-61. Available from: http://dx.doi.org/10.1016/j.ijge.2016.11.002
4. Hudson L, Chittams J, Griffith C, Compher C. Malnutrition Identified by Academy of Nutrition and Dietetics / American Society for Parenteral and Enteral Nutrition Is Associated With More 30-Day Readmissions , Greater Hospital Mortality , and Longer Hospital Stays : A Retrospective Analysis of Nutrit. JPEN J Parenter Enter Nutr. 2018;42(5):892-7.
5. Havens JM, Columbus AB, Seshadri AJ, Olufajo OA, Mogensen KM, Rawn JD, et al. Malnutrition at Intensive Care Unit Admission Predicts Mortality in Emergency General Surgery Patients. JPEN J Parenter Enter Nutr. 2018;42(1):156-63.
6. Asiimwe SB, Muzoora C, Wilson LA, Moore CC. Bedside measures of malnutrition and association with mortality in hospitalized adults. Clin Nutr [Internet]. 2015;34(2):252-6. Available from: http://dx.doi.org/10.1016/j.clnu.2014.03.013
7. Sriram K, Sulo S, Vanderbosch G, Partridge J, Feldstein J, et al. A Comprehensive Nutrition-Focused Quality Improvement Program Reduces 30-Day Readmissions and Length of Stay in Hospitalized Patients. JPEN J Parenter Enter Nutr. 2017;41(3):384-91.
8. Tangvik RJ, Tell GS, Eisman JA, Berit A, Henriksen A, Miodini R, et al. The nutritional strategy : Four questions predict morbidity , mortality and health care costs. Clin Nutr [Internet]. 2014;33(4):634-41. Available from: http://dx.doi.org/10.1016/j.clnu.2013.09.008
9. Cederholm T, Jensen GL, Correia MI, Gonzalez MC, Fukushima R, Higashiguchi T, et al. GLIM criteria for the diagnosis of malnutrition – a consensus report from the global clinical nutrition community. Clin Nutr. 2018;1-4.
10. Van Bokhorst-de van der Schueren M, Guaitoli P, Jansma E, De Vet H. Nutrition screening tools: Does one size fit all ? A systematic review of screening tools for the hospital setting. Clin Nutr [Internet]. 2014;33(1):39-58. Available from: http://dx.doi.org/10.1016/j.clnu.2013.04.008

11. Cederholm T, Bosaeus I, Barazzoni R, Bauer J, Gossum AV, Klek S, et al. Diagnostic criteria for malnutrition – An ESPEN Consensus Statement. Clin Nutr [Internet]. 2015;1-6. Available from: http://dx.doi.org/10.1016/j.clnu.2015.03.001
12. White J, Guenter P, Jensen G, Malone A, Schofield M. Consensus Statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Characteristics Recommended for the Identification and Documentation of Adult Malnutrition (Undernutrition). JPEN J Parenter Enter Nutr. 2012;36(3):275-83.
13. Hébuterne X, Lemarié E, Michallet M, Montreuil CBD, Schneider SM. Prevalence of Malnutrition and Current Use of Nutrition Support in Patients With Cancer. J Parenter Enter Nutr. 2014;38(2):196-204.
14. Teigen LM, Kuchnia AJ, Mourtzakis M, Earthman CP. The Use of Technology for Estimating Body Composition : Strengths and Weaknesses of Common Modalities in a Clinical Setting. Nutr Clin Pract. 2017;32(1):20-9.
15. Maeda K, Ishida Y, Nonogaki T, Mori N. Reference body mass index values and the prevalence of malnutrition according to the Global Leadership Initiative on Malnutrition criteria. Clin Nutr [Internet]. 2019;1-5. Available from: https://doi.org/10.1016/j.clnu.2019.01.011
16. Blaauw R, Dolman R, Senekal M, Visser J. Diagnostic criteria for adult hospital malnutrition: Making sense of it all. Clin Nutr [Internet]. 2018;37:S42. Available from: https://doi.org/10.1016/j.clnu.2018.06.1198
17. Niyongabo T, Henzel D, Ndayishimyie JM, Melchior JC, Ndayiragije A, Ndihokubwayo JB, et al. Nutritional status of adult inpatients in Bujumbura , Burundi (impact of HIV infection). Eur J Clin Nutr. 1999;53:579-82.
18. Luma HN, Albert S, Bagnaka F, Mboligong FN, Temfack E, Donfack OT, et al. Malnutrition in patients admitted to the medical wards of the Douala General Hospital : a cross - sectional study. BMC Res Notes. 2017;10:1-6.
19. Tonder EV, Mace L, Steenkamp L, Gerber K, Group F. Mid-upper arm circumference (MUAC) as a feasible tool in detecting adult malnutrition. SAJCN [Internet]. 2018;0(0):1-6. Available from: https://doi.org/10.1080/16070658.2018.1484622