

Diagnostic performance of visible severe wasting for identifying severe acute malnutrition in children admitted to hospital in Kenya

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Objective To determine the diagnostic value of visible severe wasting in identifying severe acute malnutrition at two public hospitals in Kenya.

Methods This was a cross-sectional study of children aged 6 to 59.9 months admitted to one rural and one urban hospital. On admission, mid-upper arm circumference (MUAC), weight and height were measured and the presence of visible severe wasting was assessed. The diagnostic performance of visible severe wasting was evaluated against anthropometric criteria.

Findings Of 11 166 children admitted, 563 (5%) had kwashiorkor and 1406 (12.5%) were severely wasted (MUAC < 11.5 cm). The combined sensitivity and specificity of visible severe wasting at the two hospitals, as assessed against a MUAC < 11.5 cm, were 54% (95% confidence interval, CI: 51–56) and 96% (95% CI: 96–97), respectively; at one hospital, its sensitivity and specificity against a weight-for-height z-score below –3 were 44.7% (95% CI: 42–48) and 96.5% (95% CI: 96–97), respectively. Severely wasted children who were correctly identified by visible severe wasting were consistently older, more severely wasted, more often having kwashiorkor, more often positive to the human immunodeficiency virus, ill for a longer period and at greater risk of death. Visible severe wasting had lower sensitivity for determining the risk of death than the anthropometric measures. There was no evidence to support measuring both MUAC and weight-for-height z-score.

Conclusion Visible severe wasting failed to detect approximately half of the children admitted to hospital with severe acute malnutrition diagnosed anthropometrically. Routine screening by MUAC is quick, simple and inexpensive and should be part of the standard assessment of all paediatric hospital admissions in the study setting.

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Introduction

Complicated severe acute malnutrition is a life-threatening condition requiring urgent, specialized treatment. The World Health Organization (WHO) defines severe acute malnutrition as a mid-upper arm circumference (MUAC) < 11.5 cm, a weight-for-height z-score (WHZ) below –3, or the presence of bilateral pedal oedema in children with kwashiorkor. In the absence of anthropometric assessment, severe acute malnutrition can also be diagnosed by assessing children for visible severe wasting, defined as the presence of muscle wasting in the gluteal region, loss of subcutaneous fat, or prominence of bony structures, particularly over the thorax.¹ Severe acute malnutrition differs from chronic malnutrition, which manifests as stunting. Early recognition of severe acute malnutrition among sick children is important because standard management protocols may reduce mortality.² MUAC is often used for community screening in therapeutic feeding programmes, and MUAC and/or WHZ are commonly used to assess the need for admission to therapeutic feeding programmes. However, in many hospitals in sub-Saharan Africa weight is the only systematically measured anthropometric index.^{3–5} Consequently, in practice, the diagnosis of severe acute malnutrition among children upon admission to hospital often depends on clinical recognition.⁶

Few studies have examined the performance of visible severe wasting in identifying children with severe acute malnutrition. Bern et al. observed that visible severe wasting identified a group of children with a very high short-term mortality risk and that it was as strongly associated with mortality as a low WHZ (i.e. below –3 by National Center for Health

Statistics growth reference standards).⁷ The sensitivity of visible severe wasting for detecting children with severe wasting diagnosed anthropometrically in a practical setting was 56% when assessed by Gambian nurses and 67% when assessed by Ethiopian health workers immediately following training.^{6,8}

The aim of this study is to evaluate the diagnostic value of visible severe wasting for diagnosing severe acute malnutrition, as defined by MUAC and WHZ using WHO growth reference standards, in children admitted to one rural and one urban public hospital in Kenya.

Methods

Location

The study was conducted at two hospitals on the Kenyan coast that were chosen to reflect urban and rural settings. Coast Provincial General Hospital in Mombasa is the largest provincial public hospital in Kenya, with 113 paediatric beds. The hospital, together with three smaller district hospitals, serves approximately 1 million people living in the urban and periurban areas of greater Mombasa, which includes several informal settlements,⁹ and it also receives provincial referrals. Inpatient care is provided by medical officers, and by medical officer and clinical officer interns under the supervision of two consultant paediatricians.

Kilifi District Hospital, located in a rural area about 60 km north of Mombasa, has 89 paediatric beds or cots. The hospital serves about 240 000 people, mainly farmers. A Kenya Medical Research Institute (KEMRI) centre and the KEMRI/Wellcome Trust Research Programme, which are based at this hospital, conduct research on severe childhood illness

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and malnutrition.^{10,11} Full-time research clinicians provide inpatient paediatric medical care, including care in a high-dependency unit. The long-term presence of the research programme at Kilifi District Hospital ensures the availability of additional resources, including a comprehensive microbiology laboratory, the capability to measure blood gases and other biochemical parameters, increased medical and nursing staff, and support for making available essential drugs and other clinical supplies.

Both hospitals used the treatment approach recommended in current WHO guidelines, including standardized antimicrobials, fluids, electrolytes, micronutrients and therapeutic feeding.¹² Children with complicated severe acute malnutrition were provided with care at each hospital in a distinct area that has a nutritionist and a kitchen dedicated to preparing therapeutic milks (Formula 75 and Formula 100). The two hospitals also have outpatient therapeutic and supplementary feeding programmes for children with uncomplicated malnutrition and refer complicated cases to the paediatric wards.

Training and data collection

After obtaining approval from the Kenyan National Ethical and Review Committee, we collected data during the screening of all children admitted for participation in a clinical trial at Coast Provincial General Hospital and during screening for long-term surveillance of severe malnutrition at Kilifi District Hospital.

At Coast Provincial General Hospital, government-employed medical and clinical officers and interns usually in charge of admitting children were trained to measure MUAC using insertion tapes (TALC, St Albans, England), to identify visible severe wasting and to manage severe acute malnutrition. The training, repeated approximately every three months as interns rotated through the department, included background information on the anthropometric methods involved and practical sessions (which were assessed). For every patient admitted, these measures and other clinical findings were recorded on a standardized admission clerking sheet (the paediatric admission record) and entered into a database. Prior to this screening, severe acute malnutrition was diagnosed by clinical impression, and height was only

measured among children admitted to the malnutrition ward.

At Kilifi District Hospital, trained research fieldworkers performed anthropometric measurements, including MUAC using insertion tapes, weight using a SECA 877 scale (Seca United Kingdom, Birmingham, England) and length or height using measuring boards of standard design as recommended by the United Nations Children's Fund. Trained, full-time research clinicians who normally provided clinical care performed clinical assessments and recorded their results, including the presence or absence of visible severe wasting and signs of kwashiorkor. Clinical signs were defined according to the WHO pocket book of inpatient care for children in resource-poor settings.¹² Human immunodeficiency virus (HIV) serostatus was determined from the results of rapid antibody tests undertaken on the wards as part of clinical care at both hospitals, as recommended by national guidelines.

Statistical analysis

We examined data for all children ranging in age from 6 to 59.9 months admitted to Coast Provincial General Hospital between 1 June 2009 and 31 May 2010 and to Kilifi District Hospital between 1 January 2007 and 31 December 2009. WHZ was calculated in accordance with WHO reference standards.¹³ To assess the performance of visible severe wasting for diagnosing severe acute malnutrition, we included in the analysis only children who had fully documented results for the presence or absence of visible severe wasting and MUAC. We calculated that a minimum sample size of 500 children anthropometrically diagnosed with severe wasting would allow sensitivities of between 40% and 90% to be described to within 5%.

Using MUAC and WHZ as gold standards, we first estimated the sensitivity, specificity, positive predictive value and negative predictive value of visible severe wasting. We also estimated the sensitivity and specificity for predicting inpatient death of visible severe wasting, MUAC < 11.5 cm, WHZ below -3, and of the combination criterion comprised by either a MUAC < 11.5 cm or a WHZ below -3. To compare the demographic and clinical characteristics of children with anthropometrically defined severe acute malnutrition (MUAC < 11.5 cm or WHZ below -3) who did and did not have visible severe wasting, we

used the χ^2 test for proportions. For age, duration of illness and MUAC, which were not normally distributed, we used the Kruskal-Wallis rank test, a non-parametric method. To make the main results generalizable, we identified the clinical findings that showed a consistent association (i.e. those found at the two hospitals and for both anthropometric measures). All analyses were done using Stata version 11.0 (StataCorp LP, College Station, United States of America). Significance was set at $P < 0.05$.

Results

At Coast Provincial General Hospital, 4075 children aged 6 to 59.9 months were admitted during the one-year study period. Data on MUAC or visible severe wasting were missing for 122 children (3.0%), who were therefore excluded, leaving in the analysis 3953 children, 56% of them male, with a median age of 13 months (interquartile range, IQR: 9 to 24).

At Kilifi District Hospital, 7624 children aged 6 to 59.9 months were admitted during the two-year study period. Data on MUAC or visible severe wasting were missing in 411 (5.4%) children, leaving in the main analysis 7213 children, 56% of them male, with a median age of 19.4 months (IQR: 11.6 to 31.9).

At Coast Provincial General Hospital, the median MUAC was 13.4 cm (IQR: 12.2 to 14.7) and 171 children (4.3%) had kwashiorkor. Overall, 327 of 3953 children (8.3%) died in hospital (Table 1). At Kilifi District Hospital, the median MUAC and WHZ were 13.7 cm (IQR: 12.5 to 14.7) and -1.3 (IQR: -2.3 to -0.4), respectively, and 392 children (5.6%) had kwashiorkor. Overall, 192 of 7213 children (2.7%) died in Kilifi District Hospital (Table 1).

Severe wasting as defined by MUAC was more common among children admitted to Coast Provincial General Hospital than among those admitted to Kilifi District Hospital (Table 1). At Coast Provincial General Hospital, 103 of 327 deaths (31%) and, at Kilifi District Hospital, 117 of 192 deaths (61%) were associated with severe wasting as diagnosed by MUAC (Table 1). In both hospitals the highest case fatalities were reported among the most severely wasted children. The largest differences in the proportions of children that died between the two hospitals were found among the least wasted children.

Table 1. Number of children aged 6 to 59.9 months admitted to two public hospitals in Kenya and proportion of deaths, by mid-upper arm circumference (MUAC), 2007–2010

MUAC (cm)	CPGH		KDH	
	Admissions No. (%)	Deaths No. (%)	Admissions No. (%)	Deaths No. (%)
< 11.5 (severely acute malnutrition)	604 (15.3)	103 (17.1)	802 (11.1)	117 (14.6)
11.5 to 12.4 (moderately acute malnutrition)	658 (16.7)	77 (11.7)	881 (12.2)	43 (4.9)
12.5 to 13.4 (at risk of acute malnutrition)	750 (19.0)	47 (6.3)	1483 (20.2)	29 (2.0)
≥ 13.5 (not acutely malnourished)	1941 (49.1)	100 (5.2)	4047 (56.1)	58 (1.4)
Total	3953 (100)	327 (8.3)	7213 (100)	192 (2.7)

CPGH, Coast Provincial General Hospital; KDH, Kilifi District Hospital.

Table 2. Diagnostic performance of visible severe wasting against anthropometric diagnosis of severe wasting among children aged 6 to 59.9 months admitted to two public hospitals in Kenya, 2007–2010

Parameter	CPGH	KDH	
	MUAC < 11.5 cm n = 3 953	MUAC < 11.5 cm n = 7 213	WHZ below -3 n = 6 720
Sensitivity, % (95% CI)	47.2 (43.2–51.2)	58.7 (55.3–62.1)	44.7 (41.6–47.9)
Specificity, % (95% CI)	97.0 (96.3–97.5)	96.1 (95.6–96.5)	96.5 (96.0–97.0)
PPV, % (95% CI)	73.6 (69.0–77.8)	65.2 (61.7–68.6)	68.3 (64.5–71.8)
NPV, % (95% CI)	91.1 (90.1–92.0)	94.9 (94.3–95.4)	91.2 (90.5–91.9)

CI, confidence interval; CPGH, Coast Provincial General Hospital; KDH, Kilifi District Hospital; MUAC, mid-upper arm circumference; NPV, negative predictive value; PPV, positive predictive value; WHZ, weight-for-height z score.

The sensitivity and specificity of visible severe wasting for MUAC < 11.5 cm based on the combined results from the two hospitals were 54% (95% CI: 51–56) and 96% (95% CI: 96–97), respectively. The sensitivity and specificity of visible severe wasting when assessed against a WHZ below -3 (Kilifi District Hospital only) were 44.7% (95% CI: 42–48) and 96.5% (95% CI: 96–97), respectively (Table 2).

The sensitivity and specificity for predicting inpatient death at Kilifi District Hospital were 41% (95% CI: 34–48) and 91% (95% CI: 90–92), respectively, for visible severe wasting; 48% (95% CI: 41–55) and 90% (95% CI: 89–91), respectively, for MUAC < 11.5 cm; and 53% (95% CI: 46–60) and 86% (95% CI: 85–87), respectively, for a WHZ below -3.

The combination criterion of either a MUAC < 11.5 cm or a WHZ below -3 had a sensitivity for detecting inpatient death of 60% (95% CI: 53–67), which was the highest, but a specificity of 83% (95% CI: 82–84), which was the lowest. A MUAC < 11.9 cm showed the same specificity for predicting death (83%) but higher sensitivity (64%; 95% CI: 56–71).

The demographic and clinical characteristics of children with severe wasting as diagnosed by MUAC (in both hospitals) and by WHZ (in Kilifi District Hospital only), with and without visible severe wasting, are shown in Table 3. Most severely wasted children diagnosed by MUAC had a history of febrile illness, one third had signs of severe pneumonia, more than half had diarrhoea and more than one third had signs of dehydration. In both hospitals, severely wasted children who were correctly identified by visible severe wasting were consistently older, more severely wasted, more often having kwashiorkor, more often positive for HIV antibodies and ill for a longer period at presentation. Among children who were severely wasted as defined by anthropometric parameters, those with visible severe wasting died in hospital more frequently than those without it. The combined sensitivity at the two hospitals of visible severe wasting as assessed against a MUAC < 11.5 cm was 39% (95% CI: 35–42) among children aged < 12 months and 66% (95% CI: 63–70) among children aged 12 months or more.

Discussion

Visible severe wasting failed to detect approximately half of the children with severe wasting diagnosed anthropometrically who were admitted to two Kenyan hospitals. Thus, if anthropometric screening is not routinely performed on admission, sick severely malnourished children may not receive the immediate specialized care they require, including oral glucose or early feeding, empiric antimicrobials, appropriate correction of fluid and electrolyte disturbances, therapeutic feeding and closer observation. Visible severe wasting consistently identified older children with severe acute malnutrition; MUAC and WHZ, on the other hand, consistently identified younger children with severe wasting.¹⁴ This suggests that the diagnostic performance of visible severe wasting is age-dependent. The specificity of visible severe wasting for the detection of children with anthropometrically defined wasting was high, but its sensitivity was low, particularly among infants. Visible severe wasting made it possible to detect the most severely wasted children (i.e. those who had, on average, a WHZ below -4).

Among children who had severe wasting by anthropometric criteria, those with visible severe wasting were at higher risk of death than those without. However, visible severe wasting was not useful in detecting many others at substantial risk of dying, as its sensitivity for predicting inpatient death was lower than that of the anthropometric criteria. Therefore, our results do not support the view that visible severe wasting is effective for identifying children with severe acute malnutrition.^{7,11} Such a view is largely founded on the results of studies focused on visible severe wasting as a parameter for detecting children

Table 3. Demographic and clinical characteristics of children aged 6 to 59.9 months with anthropometrically diagnosed severe acute malnutrition^a, with and without visible severe wasting (VSW), admitted to two public hospitals in Kenya, 2007–2010

Characteristic	CPGH		KDH		KDH		P
	MUAC < 11.5 cm		WHZ below -3		WHZ below -3		
	Without VSW (n = 285)	With VSW (n = 319)	Without VSW (n = 331)	With VSW (n = 471)	Without VSW (n = 534)	With VSW (n = 432)	
Age, median (IQR)	9.0 (7.0 to 13)	12 (9.0 to 17)	11 (8.0 to 16)	18 (11 to 25)	15 (9.8 to 25)	18 (12 to 25)	0.002
Male, No. (%)	149 (47)	140 (49)	179 (54)	232 (50)	345 (65)	235 (54)	0.001
Duration of illness (days), median (IQR)	3 (3 to 7)	4.5 (3 to 10)	3 (2 to 7)	4 (3 to 7)	3 (2 to 4)	4 (3 to 7)	<0.001
History of fever, No. (%)	285 (89)	226 (79)	262 (79)	341 (72)	410 (77)	327 (76)	0.69
History of cough or difficulty breathing, No. (%)	243 (76)	210 (74)	206 (62)	329 (70)	302 (57)	287 (66)	0.002
History of diarrhoea, No. (%)	172 (54)	170 (60)	164 (50)	233 (50)	267 (50)	222 (51)	0.69
Deep acidotic breathing, No. (%)	17 (5.3)	11 (3.9)	47 (14)	45 (9.6)	75 (14)	38 (8.8)	0.01
Lower chest wall indrawing, No. (%)	136 (42)	105 (37)	103 (31)	135 (29)	138 (26)	111 (26)	0.96
Sunken eyes, No. (%)	118 (37)	147 (52)	94 (29)	115 (25)	165 (31)	115 (27)	0.14
Skin pinch > 2 seconds, No. (%)	42 (13)	96 (34)	68 (21)	113 (24)	111 (21)	102 (24)	0.30
Weak pulse, No. (%)	39 (13)	58 (21)	17 (5.2)	38 (8.2)	26 (4.9)	30 (7.0)	0.17
MUAC, mean (95% CI)	10.6 (10.5 to 10.7)	9.9 (9.7 to 10.0)	10.5 (10.4 to 10.6)	10.0 (9.9 to 10.1)	10.6 (10.5 to 10.7)	10.0 (9.9 to 10.1)	<0.001
WHZ, mean (95% CI)	-	-	-3.2 (-3.3 to -3.0)	-4.2 (-4.3 to -4.0)	-3.8 (-3.9 to -3.7)	-4.4 (-4.5 to -4.3)	<0.001
Kwashiorkor, No. (%)	24 (7.5)	54 (19)	25 (7.6)	129 (27)	25 (4.7)	95 (22)	<0.001
Positive to HIV antibodies, No. (%)	14/142 (9.9)	29/146 (20)	41 (13)	128 (29)	44 (8.7)	116 (28)	<0.001
Died in hospital (%)	37 (13)	70 (22)	36 (11)	80 (17)	36 (6.4)	65 (15)	<0.001

CI, confidence interval; CPGH, Coast Provincial General Hospital; HIV, human immunodeficiency virus; IQR, interquartile range; KDH, Kilifi District Hospital; MUAC, mid-upper arm circumference; WHZ, weight-for-height z-score.
^a Defined as a MUAC < 11.5 cm or a WHZ below -3.

at higher risk of death, rather than on diagnostic performance.

Severe acute malnutrition was common among children admitted to the two study hospitals. The overall proportion of children who died was lower at Kilifi District Hospital than at Coast Provincial General Hospital, but the greatest difference in the number of deaths between the two hospitals was found in children who were not severely malnourished. This may be attributable to the following factors at Kilifi District Hospital: (i) less severe disease in admitted children; (ii) better staffing owing to the presence of a research facility; (iii) less frequent turnover of first-line clinicians; (iv) the availability of tests such as blood gas analysis and microbiological culture, and (v) ensured supplies of drugs and fluids. The finding that more severely wasted children in both hospitals died at similar rates is somewhat surprising because at Kilifi District Hospital the factors just mentioned allowed for more rigorous application there of the WHO guidelines for the management of severe malnutrition. These factors, especially retention of trained staff, ensured the provision of overnight feeds, the availability of care in a high-dependency unit when required, closer observation of children by nurses, and the availability of high-quality laboratory facilities. This finding suggests that some aspects of the current guidelines may need re-evaluation to reduce mortality.¹⁵

Because both MUAC and WHZ are used by some therapeutic feeding programmes to determine if a child should be admitted, we examined the performance of the two used together and individually. Although using either a MUAC < 11.5 cm or a WHZ below -3 resulted in the highest sensitivity for predicting death, specificity was markedly reduced. The MUAC cut-off value having the same specificity for predicting death as a combination criterion of either MUAC < 11.5 cm or WHZ below -3 yielded a greater sensitivity. These findings concur with those of a recent secondary analysis of the risk of dying in a community-based data set in rural Senegal¹⁶ and provide further evidence from a different setting that measuring both WHZ and MUAC does not result in improved identification of undernourished children at high risk of dying. Measurement of MUAC only could therefore replace the use of both

MUAC and WHZ, depending on the MUAC cut-off value chosen.

This study has several limitations. HIV antibody testing results were not available for 60% of admissions to Coast Provincial General Hospital, and this could have introduced bias. However, the association between positivity to HIV and visible severe wasting found at that hospital was consistent with the association found at Kilifi District Hospital, where HIV testing was complete. We therefore doubt that bias had much effect on the overall findings. The proportion who died among the small proportion of admissions with missing data was 38% at Coast Provincial General Hospital and 12% at Kilifi District Hospital, and this could also have introduced bias. It also points to the difficulty of obtaining anthropometric measurements in children *in extremis*.

Conclusion

At a busy urban hospital and at a rural district hospital with a focus on research, visible severe wasting failed to result in the detection of approximately half of the children admitted with anthropometrically defined severe wasting, and this poor performance was particularly evident in younger children. Measuring MUAC is inexpensive and quick and training is straightforward, rendering the use of visible severe wasting unnecessary. Measuring MUAC and assessing children for the presence of kwashiorkor are more reliable and much more straightforward than measuring weight and height, then having to look up *z* scores on a reference table. Thus, MUAC should be routinely measured as part of the clinical assessment of all children admitted to hospitals in sub-Saharan

Africa. Further research should be conducted to develop a stronger evidence base for diagnosing and managing severe acute malnutrition, especially in children outside the age range included in this study. ■

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ملخص

الأداء التشخيصي للهزال الوخيم المرئي في الكشف عن سوء التغذية الحاد الوخيم في الأطفال الذين أدخلوا المستشفى في كينيا الغرض تحديد جدوى تشخيص الهزال الوخيم المرئي في التعرف على سوء التغذية الحاد الوخيم في مستشفيات عموميين في كينيا. الطريقة أجريت هذه دراسة المستعرضة على الأطفال في الفئة العمرية 6-59.9 شهر، والذين أدخلوا مستشفيات أحدهما في الريف والآخر في المدينة. وعند الدخول إلى المستشفى قيس محيط وسط الذراع، والوزن، والطول، وجرى تقييم وجود أي هزال وخيم ومرئي. وتم تقييم الأداء التشخيصي للهزال الوخيم المرئي مقابل معايير القياسات البشرية. النتائج من 11166 طفلاً أدخلوا المستشفيات، وجد 563 طفلاً (5%) كانوا مصابين بالكواشيوركور، و 1406 من الأطفال (12.5%) كانوا يعانون من هزال وخيم (محيط متوسط الذراع أقل من 11.5 سنتيمتر). وكانت الحساسية والنوعية المشتركة للهزال الوخيم المرئي في المستشفيات، بحسب قياسه مقابل محيط متوسط الذراع أقل من 11.5 سنتيمتر، كانا 54% (فاصل الثقة 95%: 56-51)، و 96% (فاصل الثقة 95%: 96-97) بالترتيب؛ في أحد المستشفيات، كانت الحساسية والنوعية مقابل حُرْز *Z* للوزن

摘要

用可见的严重消瘦确定肯尼亚住院儿童严重急性营养不良的诊断效能

目的 研究可见的严重消瘦在确诊肯尼亚两家公立医院严重急性营养不良病例中的诊断价值。

方法 这是一个针对在一家城市医院和一家乡村医院住院的6到59.9个月儿童的横断面研究。入院时，测量上臂中部臂围、体重和身高并且评估是否存在可见的严重消瘦。可见的严重消瘦的诊断效能根据人体测量标准进行评估。

结果 住院的11,166名儿童中，563名(5%)患有恶性营养不良，1,406名(12.5%)严重消瘦(上臂中部臂围<11.5cm)。根据上臂中部臂围<11.5cm评估，两家医院

可见严重消瘦的组合敏感性和特异性分别为54% (95%可信区间，51-56)和96% (95%可信区间，96-97)。根据体重身高*Z*分数低于3为标准评估，一家医院的敏感性和特异性分别为44.7% (95%可信区间，42-48)和96.5% (95%可信区间，96-97)。运用可见严重消瘦正确确诊的严重消瘦儿童均为年龄较大、消瘦较严重、往往患有恶性营养不良、人体免疫缺陷病毒通常呈阳性、生病的时间较长和处于较大死亡的风险之中的儿童。与人体测量相比，可见严重消瘦在决定死亡风险方面的敏感性较

低。没有任何证据支持既测量上臂中部臂围又测量体重身高Z分数。

结论 可见的严重消瘦未能确定出近一半的通过人体测量方法诊断出的患有严重急性营养不良的入院儿童。用上

臂中部臂围测量方法进行常规筛查不仅快速简单而且价格低廉，就本研究而言应该成为所有儿科住院标准评定的一部分。

Résumé

Résultats diagnostiques de l'émaciation sévère et visible dans l'identification de la malnutrition aiguë sévère chez des enfants hospitalisés au Kenya

Objectif Déterminer la valeur diagnostique de l'émaciation sévère et visible dans l'identification de la malnutrition aiguë sévère dans deux hôpitaux publics du Kenya

Méthodes Il s'agissait d'une étude transversale réalisée sur des enfants de 6 à 59,9 mois hospitalisés dans un établissement sanitaire rural et dans un établissement sanitaire urbain Lors de l'hospitalisation, on a mesuré leur périmètre brachial moyen (MUAC), leur poids et leur taille, ce qui a permis d'évaluer la présence d'une émaciation sévère et visible Les résultats diagnostiques de l'émaciation sévère et visible ont été comparés aux critères anthropométriques

Résultats Sur 11 166 enfants hospitalisés, 563 (5%) souffraient de kwashiorkor et 1406 (12,5%) étaient gravement émaciés (MUAC < 11,5 cm). La sensibilité et la spécificité associées de l'émaciation sévère et visible dans les deux hôpitaux comparées à un MUAC < 11,5 cm étaient de 54% (intervalle de confiance de 95%, IC: 51-56) et de 96% (IC de 95%: 96-97), respectivement. Dans l'un des hôpitaux, sa sensibilité et sa spécificité par rapport à un score z de poids / taille

inférieur à - 3 étaient de 44,7% (IC de 95%: 42-48) et de 96,5% (IC de 95%: 96-97) respectivement. Les enfants sévèrement émaciés pour lesquels un diagnostic d'émaciation sévère et visible était correct étaient généralement plus âgés, plus sévèrement émaciés, présentaient plus souvent le kwashiorkor, étaient plus souvent séropositifs, avaient été malades plus longtemps et présentaient un risque de décès plus élevé. L'émaciation sévère et visible avait une sensibilité plus faible dans la détermination du risque de décès que les mesures anthropométriques. Il n'existait aucune preuve étayant le fait qu'il faille à la fois mesurer le MUAC et le score z poids/taille.

Conclusion L'émaciation sévère et visible n'a permis de déceler une malnutrition aiguë sévère que chez la moitié environ des enfants hospitalisés par rapport à un diagnostic anthropométrique. Le dépistage systématique par MUAC est rapide, simple et peu coûteux et il devrait faire partie de l'évaluation type de toutes les hospitalisations pédiatriques étudiées.

Резюме

Диагностическая картина видимого тяжелого истощения при распознавании тяжелого острого недоедания у детей, поступивших в кенийскую больницу

Цель Определить ценность диагностики видимого тяжелого истощения для распознавания тяжелого острого недоедания среди пациентов двух государственных больниц в Кении.

Методы Проведено кросс-секционное обследование детей в возрасте от 6 до 59,9 месяцев, поступивших в одну сельскую и одну городскую больницу. При поступлении измерялись окружность середины плеча (ОСП), масса тела и рост, и оценивалось наличие тяжелого острого недоедания. Диагностическая картина видимого тяжелого истощения оценивалась по антропометрическим критериям.

Результаты Из 11 166 поступивших детей у 563 (5%) наблюдался квашиоркор, а у 1406 (12,5%) – тяжелое истощение (ОСП менее 11,5 см). Совокупные чувствительность и специфичность видимого тяжелого истощения, оцениваемого по ОСП менее 11,5 см, в обеих больницах составили, соответственно, 54% (95% доверительный интервал, ДИ: 51–56) и 96% (95% ДИ: 96–97); в одной больнице его чувствительность и специфичность относительно значения z-счета для индекса «масса тела–рост» ниже –3 составили, соответственно, 44,7% (95% ДИ: 42–48) и

96,5% (95% ДИ: 96–97). Дети с тяжелым истощением, которым был правильно поставлен диагноз на основании видимого тяжелого истощения, были явно старше, более тяжело истощены, у них чаще наблюдались квашиоркор и положительная реакция на вирус иммунодефицита человека, они болели в течении более длительного периода, и у них был выше риск смертельного исхода. Видимое тяжелое истощение имело более низкую чувствительность для определения риска смертельного исхода, чем антропометрические измерения. Не было обнаружено данных в пользу одновременного измерения ОСП и z-счета для индекса «масса тела–рост».

Вывод Видимое тяжелое истощение не было выявлено примерно у половины детей, которые поступили в больницу с тяжелым острым недоеданием, диагностированным по антропометрическим измерениям. Рутинный скрининг на основании ОСП является быстрым, простым и недорогим методом и должен в данных условиях стать элементом стандартной оценки больных, поступающих во все детские больницы.

Resumen

Desempeño diagnóstico de la emaciación grave visible para identificar la malnutrición aguda grave en niños ingresados en hospitales de Kenia

Objetivo Determinar el valor diagnóstico de la emaciación grave visible en la identificación de la malnutrición aguda grave en dos hospitales públicos en Kenia.

Métodos Se realizó un estudio transversal de niños de entre 6 y 59,9 meses ingresados en un hospital rural y en un hospital urbano. En el

ingreso, se midieron la circunferencia de la parte superior del brazo (MUAC, por sus siglas en inglés), el peso y la estatura. Asimismo, también se evaluó la presencia de emaciación grave visible. Se evaluó el desempeño diagnóstico de la emaciación grave visible frente a criterios antropométricos.

Resultados De 11 166 niños ingresados, 563 (5%) padecían kwashiorkor y 1406 (12,5%) presentaban emaciación grave (MUAC < 11,5 cm). La sensibilidad y especificidad de emaciación grave visible combinadas en los dos hospitales, evaluados frente a un MUAC < 11,5 cm, fueron del 54% (95% de intervalo de confianza, IC: 51-56) y 96% (95% IC: 96-97), respectivamente; en un hospital, su sensibilidad y especificidad frente a un peso para la estatura de puntuación Z, inferior a -3, fueron del 44,7% (95% IC: 42-48) y 96,5% (95% IC: 96-97), respectivamente. Los niños con emaciación grave identificados correctamente por la emaciación grave visible eran constantemente mayores, con una emaciación más grave, padeciendo con mayor frecuencia kwashiorkor, con mayor frecuencia eran más positivos al virus de inmunodeficiencia humana, enfermos

por un periodo más largo de tiempo y con un mayor riesgo de muerte. La emaciación grave visible presentó una sensibilidad menor para la determinación del riesgo de muerte que las medidas antropométricas. No se encontraron evidencias para apoyar la medición tanto de MUAC como de peso por estatura de puntuación Z.

Conclusión Se falló en la detección de la emaciación grave visible en, aproximadamente, la mitad de los niños ingresados en el hospital con un diagnóstico antropométrico de desnutrición aguda. La evaluación rutinaria por MUAC es rápida, simple y económica y debería formar parte de la evaluación estándar de todos los ingresos pediátricos en el centro de estudio.

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