Evaluation of Nutritional Rehabilitation Wards in Basrah

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ABSTRACT

Aim: **A retrospective descriptive study was carried out to evaluate and address some selected variables of admitted children with severe acute malnutrition to five selected nutritional rehabilitation wards in Basrah, three central Hospitals, and two district hospitals. As well as to assess the extent of implementation of world health organization guidelines for management of severe acute malnutrition.**

Methods: **The data registries of the selected nutritional rehabilitation wards are reviewed from 1st of January till 31st of December 2015. The following information were reviewed: date of birth, sex, Z score (weight for length), weight on admission and discharge, weight gain, oedema, days of hospitalization, clinical diagnosis on admission and the outcome on discharge.**

Result: **Total number of registered patients are 530 with males and females percentage of (53.2% and 46.8%) respectively. Sixty six percent of admitted patients were aged below 12 months. Clinical presentation of admitted patients reveals that more than 50% of patients had diarrhoea followed by pneumonia (21%) and poor weight gain (13%). Facilities of studied hospitals were limited regarding allocated wards, beds and nursing staff, only Basrah General Hospital has isolated nutritional rehabilitation ward with 12 beds and 7 trained staff, other wards are just a room within paediatrics wards with 4-6 beds and only 2 nursing staff. Although high percentage of severe wasting, underweight and stunting reported in nutritional rehabilitation wards with statistically significant result P-value 0.001 still moderate malnutrition reported in (27%) of admitted patients. Poor weight gain was reported in 48% of total studied patients, with higher percentage of good weight gain in nutritional rehabilitation ward of Basrah General Hospital (93.7%) and least recorded percentage was (9.3%) in Al-Zubair Hospital. The outcome of the studied patients reveals that; (56.8%) of patients recovered with improvement of clinical symptoms and weight gain, the higher percentage was in the nutritional rehabilitation ward of Basrah General Hospital(85.5%) and the least one was in Basrah Maternity and Children's Hospital (38.3%). Short hospitalizations period is obvious from registered data approximately 59.4% of patients stayed for (1-5) days and only 4.9% stayed for (11-15) days. Days of hospitalization, weight gain and clinical presentation can be regarded as dependent risk factors associated with good outcome in malnourished patients.**

Conclusion: **This study concludes that management of severe acute malnutrition was not satisfactory and incomplete with faulty recording of the registered data of admitted patients. Current study recommended that the documentation of all data and records seriously will result in better understanding of the reality of nutritional rehabilitation wards.**

Keywords: Nutritional, Rehabilitation

تقييم ردهات التأهيل التغذوي في البصرة

الخلفية: تم انجاز هذه الدراسة الاسترجاعية الوصفية لتقييم وعنونة بعض المتغيرات المنتخبة للمرضى الراقدين والمصابين بسوء التغذية الشديد في خمس من ردهات التأهيل التغذوي في مستشفيات محافظة البصرة، كل من مستشفى البصرة العام، مستشفى البصرة للنسائية والاطفال، مستشفى الموانئ العام واثنتان من مستشفيات الاقضية هما مستشفى ابو الخصيب ومستشفى الزبير وكذلك تقييم درجة تطبيقها دليل منظمة الصحة العالمية في علاج سوء التغذية الشديد.

الطرائق: تم استعراض بيانات المرضى المصابين بسوء التغذية الشديد المسجلين للفترة من الاول من كانون الثاني لغاية الواحد والثلاثين من شهر كانون الاول/٢٠١٥؛ حيث تم جمع المعلومات التالية: تاريخ الولادة، الجنس، معيار(Z) لمريض الوزن عند الدخول والخروج، مقدار

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الزيادة في الوزن، وجود وذمة، عدد ايام الرقود، التشخيص السريري عند الدخول وحصيلة الرقود. وكان العدد الكلي للأطفال الداخلين في هذه الفترة هو٥٣٠ طفل منهم (٥٣.٢%) ذكر و(٤٦.٨%) انثى، (٦٠٪) من المرضى الراقدين كانوا في سن ما تحت ١٢ شهر، اغلب المرضى كانوا يعانون من بالإسهال بنسبة (٥٠٪) يتبعها اصابات ذات الرئة وبنسبة (٢١٪) وقصور اكتساب الوزن بنسبة (١٣٪). تم استعراض امكانيات المستشفيات فيما يخص وجود ردهات التأهيل التغذوي المستقلة وعدد الاسرة المخصصة حيث كان مركز التغذوي في مستشفى البصرة العام مستقل يتالف من ١٢ سرير ولديه ٧ من الكوادر التمريضية المتدربة على برنامج معالجة سوء التغذية بينما كانت الردهات الاخرى التى تم دراستها عبارة عن غرفة ضمن واقع ردهات الاطفال العامة مكونة من ٤-٦ من الاسرة واثنان من الكوادر التمريضية.

النتائج: وبالرغم من ان حالات الهزال الشديد و نقص الوزن وقصر القامة في ردهات التأهيل التغذوي سجلت بنسب معتد بها احصائيا بينما سوء التغذية المتوسط سجل لدى ٢٧٪ من المرضى. وكانت نسبة القصور في اكتساب الوزن ٤٨% من المرضى الذين تم دراستهم في حين ان اكبر نسبه للزيادة الجيدة بالوزن للمرضى الراقدين في ردهات مستشفى البصرة العام بينما النسبة الاقل في اكتساب الوزن لدى المرضى الراقدين في مستشفى الزبير العام وبنسبة (٩.٣٪). كانت نسبة التحسن السريري وزيادة الوزن للمرضى الراقدين في ردهات التأهيل التغذوي هي ٥٦.٨% وكانت الاعلى في ردهة التأهيل التغذوي في مستشفى البصرة العام وبنسبة (٨٥.٥٪). والنسبة الاقل في مستشفى البصرة للنسائية والاطفال وهي (٣٨.٣٪) .اظهرت الدراسة قصر فترة الرقود كان واضحا فقد اظهر ان (٥٩,٤٪) من المرضى يرقدون ما بين (١-٥) يوم فقط بينما (٤.٩٪) بقوا فترة من (١١-١٥) يوما. ان عدد ايام الرقود، درجة اكتساب الوزن والاعراض السريرية تم اعتبارها عوامل خطورة معتمدة مقترنه مع التحسن الافضل لمرضى سوء التغذية.

الاستنتاج: استنتجت الدراسة بأن علاج حالات سوء التغذية الشديد لم يكن مكتمل وكان نمط تسجيل البيانات مرضى سوء التغذية مغلوطا عليه فأن توثيق الصحيح لكافة البيانات والسجلات وبشكل جدي سيسهم في فهم واقع ردهات التأهيل التغذوي.

INTRODUCTION

Severe acute malnutrition (SAM) is the major and common cause of morbidity and mortality among children under five years of age worldwide especially in developing countries.[1] Children with severe acute malnutrition have physiological and metabolic changes to conserve energy and preserve essential processes, including reductions in the functional capacity of organs and slowing of cellular activities. In addition to coexisting infections with the difficulty of maintaining metabolic control, severely malnourished children are at risk of death from hypoglycaemia, hypothermia, electrolytes imbalance, heart failure and untreated infection.[2,3] children with SAM are admitted to nutrition rehabilitation wards as the defined admission criteria, where they are managed and provided with medical and nutritional therapeutic care, in order to promote physical and psychosocial growth and build up the capacity of mothers in appropriate feeding practices.[4] World Health Organization (WHO) guidelines for management of children with severe malnutrition (6-59 months) involve ten steps in two phases; an initial stabilization phase, where the actual medical conditions are managed and a longer rehabilitation phase. Standardized case management protocol include appropriate feeding, micronutrient supplementation, antibiotic therapy, intravenous fluid for shock state, use of rehydration solution of malnutrition (ReSoMal) and careful management of complications. Feeding is a critical part in management of severe acute malnutrition should begin as soon as possible with F75 "starter formula" used for 2-7 days, followed by F100"catch up" formula. Therefore

severely malnourished children are prioritized for immediate admission to nutritional rehabilitation wards (NRWs) and with proper case management and follow up care, the case fatality rate can be lowered from over 30% to less than 5%.[5]

MATERIALS & METHODS

This retrospective descriptive study had been carried out to review the registries data of children with severe acute malnutrition (SAM) admitted to the nutritional rehabilitation wards of five hospitals in Basrah governorate from 1st of January to 31st of December 2015. Three central hospitals; Basrah Maternity and Children Hospital (BMCH): has 6 beds for severe acute malnutrition within pediatrics wards. Basrah General Hospital (BGH): has isolated nutritional rehabilitation ward consists of 12 beds. Al-Mawani General Hospital (MGH) also has 4 beds for nutritional rehabilitation within paediatrics wards. Two district hospitals which were chosen purposely because they are easily accessible; Al-Zubair General Hospital(ZH); has only a room with 4 beds as nutrition room and Abu-Alkhasib General Hospital (AKH) with 4 beds within paediatrics wards. The Reviewed registered data are: date of birth, sex, Z-scores, weight on admission and discharge, weight gain, oedema, days of hospitalization, clinical diagnosis on admission and their outcome. The three commonly used anthropometric indices are: weight-for-age (WFA), length-for-age or height-for-age (HFA) and weight-for-length or weight-for-height (WFH), used to identify underweight, stunting and wasting, respectively. Each of these nutritional indicators is expressed in standard deviation units from the median of the reference population and further classification accordingly as moderate (<-2 to >-3 SD) or severe (<-3 SD) malnutrition. Weight gain was expressed as gm/kg/day and classified into; poor less than 5gm/kg/day, moderate 5-10 gm/kg/day and good > 10 gm / kg / day**.** Admission criteria to NRW as follow: children aged 6 months and above; mid upper arm circumference (MUAC) less than 115 mm, WFH < -3 SD or oedema of both feet, while infants aged up to 6 months and below admission criteria are considered when have visible severe wasting, breast feeding difficulties or oedema of both feet. The basic needs for proper and sufficient milk preparation are: dietary weight scales (minimum 5 gm), measuring jar, electric blender, boiled water, refrigerator, cooking utensils, feeding cups, saucers, spoons and jugs. As well as kitchen, cooker and refrigerator to keep milk after preparation. Preparation of therapeutics milk from available local sources as milk, sugar, oil and minerals solution.[1]

Study subjects and Data collection

A request was submitted to the research committee at Basrah health directorate to facilitate gathering data from nutritional rehabilitation wards in five hospitals; as well as permission from pediatrics departments authorities was taken to review the registered data of admitted patients over a period of one year. Checklist had been arranged to review the proper practice of standardized case management protocol according to WHO guidelines for management of severe malnutrition includes the following aspects**:** weight gain, type of therapeutic milk as F75, F100 and diluted F100**,** choice of antibiotics, vitamin A and mineral supplementation and rehydration with ReSoMal. The diagnosis and registration records follow up were reviewed.

RESULTS

Facilities in the studied nutritional rehabilitation wards (NRWs)

Only BGH has isolated ward with 12 beds and 7 trained nursing staff; while all other nutritional rehabilitation wards were just rooms within paediatric wards with 4-6 beds, had limited nursing staff (only 2). Also insufficient milk preparation facilities were noticed because of the lack of isolated kitchen in nutritional rehabilitation wards of (MH) and (BMCH).

1. Distribution of the registered malnourished patients

Higher frequency of admitted malnourished patients to the nutritional rehabilitation wards of ZH and AK H (36.6%, 30.9%) respectively (Table-1).

Table 1. Distribution of malnourished patients admitted to different nutritional rehabilitation wards (NRWs)

Hospitals	No. %
Basrah General Hospital (BGH)	55 (10.4)
Basrah Maternity Hospital(BMCH)	47 (8.9)
Al-mawani Hospital(MGH)	70 (13.2)
Al zubair Hospital(ZH)	194 (36.6)
Abu-Alkhasib Hospital(AK H)	164 (30.9)
Total	**530 (100%)**

2. Characteristics of the studied malnourished patients

Total number of malnourished patients admitted to the nutritional rehabilitation wards were 530; their mean ages ranged from (1-48) months, 53.2% were males and 46.8% were females, their mean age was 11.6 ± 1.8 months. (Table-2), shows that the highest percentage of admitted patients were below 12 months (66%). Reviewed data of clinical presentation of admitted children revealed that more than 50% of malnourished patients had diarrhea followed by pneumonia (21%) and only (13.4%) had poor weight gain.

Table 2. Age, sex and clinical presentation of admitted malnourished patients

Variables		No.	%
Age(months)	1-6	128	24.2
	> 6-12	222	41.9
	> 12-24	152	28.7
	> 24-48	28	5.2
Sex	Males	282	53.2
	Females	248	46.8
Clinical presentation	Diarrhea	296	55.8
	Pneumonia	112	21.1
	Poor weight gain	71	13.4
	UTI	29	5.5
	Others	22	4.2
Total		**530**	**100**

3. Nutritional status of the studied children

Severe and moderate malnutrition; were recorded in (72.4%) and (27.6%) respectively. (Table-3), reveals that; higher percentage of moderate malnutrition admitted in (MGH, 55.7%) and least in (BGH,10.9%), as well as severe malnutrition reported in (44.3%,89.1%) respectively with statistically significant distribution of moderate and severe malnutrition with NRWs of the different hospitals (P value = 0.001).

Table 3. Admission criteria of the malnourished children in studied NRWs

Wasting	BGH No. (%)	BMCH No. (%)	MGH No. (%)	ZH No. (%)	AK H No. (%)	Total (%)
Moderate	6 (10.9)	17 (36.2)	39 (55.7)	40 (20.6)	41 (25)	143 (26.9)
Severe	49 (89.1)	30 (63.8)	31 (44.3)	154 (79.4)	123 (75)	387 (73%)
Total	**55**	**47**	**70**	**194**	**164**	**530 (100)**

P value =0.001

4. Monitoring of the studied patients

Weight gain and outcome of admitted malnourished patients

The mean weight of malnourished children on admission and discharge was (6.1±1.67), (6.3±1.70) respectively. (Table-4), shows that 48.3% of admitted patients had poor weight gain, high percentage of children with good weight gain was reported in nutritional rehabilitation ward of BGH (92.7%) and the least was recorded in ZH (9.3%), the result was statistically significant (P value = 0.001). Evaluation of outcome of malnourished patients in studied NRWs revealed that 56.8% of patients recovered with weight gain and improvement of clinical symptoms with highest rate in NRW of BGH (85.5%) and the least in BMCH (38.3%), about one third of the registered patients their condition remained the same and had no weight gain, the least was recorded in BGH (9.1%), as well as patients who were discharged on parents request represented (7.5%) with highest rate was in BMCH and AKH (17% and 10.4%) respectively, the above result was statistically significant (P value = 0.001).

Table 4. Weight gain and outcome of the registered malnourished patients in the studied NRWs

Wt gain	BGH	BMCH	MGH	ZH	AK H	Total
Poor	3 (5.5)	20 (42.6)	28 (40)	15 (80.4)	49 (29.9)	256 (48.3)
Moderate	1 (1.8)	15 (31.9)	2 (2.9)	20 (10.3)	9 (5.5)	47 (8.9)
Good	51 (92.7)	12 (25.5)	40 (57.1)	18 (9.3)	106 (64.6)	227 (42.9)
Out come	**BGH**	**BMCH**	**MGH**	**ZH**	**AK H**	**Total**
Recovery	47(85.5)	18 (38.3)	36 (51.4)	100 (51.5)	96 (58.5)	301(56.8)
No change	5 (9.1)	20 (42.6)	33 (47.2)	81 (41.8)	51 (31.1)	186 (35.1)
Died	1 (1.8)	1 (2.1)	1 (1.4)	0 (0.0)	0 (0.0)	3 (0.6)
Discharge on request	2 (3.6)	8 (17)	0 (0.0)	13 (6.7)	17 (10.4)	40 (7.5)
Total	**55**	**47**	**70**	**194**	**164**	**530**

P value = 0.001

5. Days of hospital stay of registered patients

Short hospitalization period was obviously noticed (Table 5-A); 59.4% of all malnourished patients stayed for (1-5) days and only 4.9% stayed for (11-15) days with higher percentage for patients admitted to MGH and AKH (82.9% and 59.1%) respectively with the lowest percentage in BGH (41.8%). Ten out of the 26 (38.5%) of admitted patients who stayed for (11-15) days were from BGH. The result was statistically significant (P value= 0.001). Good and poor weight gain were recorded in (22.5% and 72.4%) and (74.1% and 15.1%) in children with hospitalization (1-5) and (6-10) days respectively, the result was statistically significant (P value= 0.001), (Table 5-B).

Table (5-A). Duration of the hospital stay for admitted patients in the studied wards.

Hospitalization stay	BGH	BMCH	MGH	ZH	AK H	Total
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
1-5	23 (41.8)	27 (57.4)	58 (82.9)	110 (56)	97 (59.1)	315 (59.4)
6-10	21 (38.2)	16 (34)	12 (17.1)	79 (40.7)	57 (34.8)	185 (34.9)
11-15	10 (18.2)	3 (6.4)	0 (0.0)	5 (2.6)	8 (4.9)	26 (4.9)
16-20	1 (1.8)	1 (2.2)	0 (0.0)	0 (0.0)	2 (1.2)	4 (0.8)
Total	55 (100)	47 (100)	70 (100)	194(100)	164 (100)	530 (100)

P value = 0.001

Table (5-B). Weight gain in relation to days of hospital stay

Days of hospitalizations	Weight gain				
	Poor	Moderate	Good	Total	P-value
	No. %	No. %	No. %	No. %	
1-5	228 (72.4)	16 (5.1)	71 (22.5)	315 (59.4)	0.001
6-10	28 (15.1)	20 (10.8)	137 (74.1)	185 (34.90)	
11-15	0 0.0	9 (34.6)	17 (65.4)	26 (4.90)	
16-20	0 0.0	2 (50.0)	2 (50.0)	4 (0.75)	
Total	256 (48.3)	47 (8.9)	227 (42.8)	530 (100)	256 (48.3)

6. Logistic regression

Studied variables underwent analysis by logistic regression as shown in (Table-6). Age, days of hospitalization, weight gain and clinical presentation can be regarded as dependent risk factors associated with good outcome in malnourished patients.

Table 6. Logistic regression analysis of selected variables and patients outcome

Variables	P-value	OR	95% CI	
Age	0.01	2.07	1.16	3.15
Sex	0.16	0.25	0.19	5.76
Days of hospitalization	0.001	3.25	1.42	5.75
Wasting	0.91	0.57	0.47	2.89
Underweight	0.45	1.55	0.01	6.71
Stunting	0.25	0.08	0.04	3.94
Clinical presentation	0.001	3.571	1.40	5.27
Weight gain	0.001	4.68	1.23	6.25

DISCUSSION

The problem of malnutrition in Iraq began to appear from the early nineties, due to the circumstances the country had been through due to war, sanctions and many other factors, which collectively led to many health problems, one of which was malnutrition.[6] So the management of SAM according to WHO guidelines in nutrition rehabilitation wards in Basrah was established and re-activated in the early twenties. Children with SAM are at risk of life threatening problems and they need careful assessment by a trained staff, special treatment and management with regular feeding and monitoring.[7] Appropriate feeding, micronutrient supplementation, broad spectrum antibiotic therapy, justified use of intravenous fluid and careful management of complications and other associated conditions are factors that can reduce death and morbidity of these children. [8,9] Reviewing the available facilities of the studied NRWs revealed limited infrastructure of the allocated wards as well as number of the medical staff. Despite the limited number of the available beds; still higher frequency of admitted patients to ZH and AK H allocated rooms for nutritional rehabilitation; three and four folds higher than NRW of BGH which has its' isolated ward with 12 beds. The registered data revealed that 2/3 of admitted children were severely malnourished and 1/3 were moderately malnourished. As well as infants under 6 months of age do not follow the recommended admission criteria as severe wasting with problem of breast feeding except in the registered data of BGH. It was found that the highest proportion of malnourished children were below twelve months of age. Similar result was concluded by Murder et al. [10] Overall proportion of males and females in the current study was nearly equal; Ashraf et al in Bangladesh and Manisha et al in India had same conclusion.[9,11] In contrast to a study carried out by Utter et al in India who found higher frequency of malnutrition in females.[12] Diarrhoea was the commonest among the associated illnesses recorded in admitted children; this is possibly due to starvation diarrhoea and decrease pancreatic enzyme secretion, followed by pneumonia due to impaired immunity. Similar finding was concluded by Esi et al in Ghana[13] and Ashraf et al in Dhaka.[9] Reviewing the data of malnourished children revealed that about (48%) had poor weight gain with limited days of hospitalization for (1-5) days. Similar result was concluded by Mitulkumar et al in India whom concluded that 59% of admitted children to nutritional rehabilitation wards had poor weight gain with limited hospital stay for 10 days.[14] Short duration of hospital stay probably explained by large family size where the mother is the only caregiver is unable to stay for long duration; this is in agreement to a study carried out in India by Mamidi et al.[15] It might be the most important reason for failure to gain weight as WHO guidelines for management of severe acute malnutrition suggest duration of 2-6 weeks for children to catch up growth. On the other hand the problem of poor weight gain may be due to the problem with food properties such as; availability of the ingredients and preparation for the recipes, hand washing, amount of mineral solution and the volume of added water to make up to 1litre as well as inadequate ward procedure in using the weighing scale. The studied mortality in NRWs was 0.6%; which did not reflect the real situation because of the higher percentage of short hospital stay and early discharge on family request for personal and social reasons and possible discharge of tired patients when the family lose the hope that their children becoming well. In the absence of follow up details of these patients any comment will be difficult. When standard guidelines are followed the case fatality rate should fall < 5% according to WHO manual for the management of severe acute malnutrition.[16] Over previous years 2008, 2009, 2010; the mortality in nutritional rehabilitation centre in BGH was (7.6%, 7%,

6.9%) respectively and declining to (5.6%) in the year 2014 according to the registered data.[6] Other researchers Hossain et al recorded a case fatality rate of 10.8% in Bangladesh.[17] The current study revealed that management of severe acute malnutrition was not satisfactory in some aspects with a problem of incomplete and faulty recording of the registered data. Ashraf et al has the same conclusion in a study carried out to explore the outcome of standardized case management of SAM in three hospitals in Bangladesh.[9] This study has its'limitation because of retrospectiveness, evidence of faulty case management practices reported; as weight gain records, admission criteria, initial antibiotics therapy, micronutrients, vitamin A supplements and follow up records. Events such as hypoglycemia, hypothermia, dehydration and electrolytes imbalance can't be identified. Same conclusion was reported by Mitulkumar, etal in India.[14] As mentioned earlier; monitoring case management practice retrospectively is difficult because of poor medical reports; common incorrect practices as irrational intravenous fluid prescription, incorrect choice of antibiotics and supplements as; vitamin A, folic acid and multivitamins were not given on regular basis.

In conclusion, incomplete and faulty recording system, some unrecorded and inconsistent data were observed in evaluated NRWs. Faulty case management practices was observed as well as absence of follow up, policy and records of discharged patients. Our recommendations are improvement of the knowledge of medical and paramedical staff through training courses on proper practice of case management of severe acute malnutrition and documentation of all data and records seriously and possibly future prospective study will result in better understanding of the reality of NRWs.

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