

Study of Malnutrition in Children below 5 years in Sulaimanya City

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Received 6/12/2009 accepted 10/3/2010

Abstract

Study of malnutrition (underweight & overweight) in children under 5 years in that area & its relation to different variables (Age, Sex, Type of milk feeding, Time of introduction of complementary feeding, maternal education and previous hospital admission). The sample was collected randomly from 4 primary health care centers in Sulaimanya city between (July – 2005) to (January – 2006). The total no. of children surveyed were 456, 256 (65.1 %) were (male), 200 (43.9%) were (female). Stunting, wasting & underweight were reported in 6.3% , 6.1% ,11.1% respectively ,while rate of obesity and overweight were 7.6% ,3.5% respectively. A statistically significant association was noted between various forms of malnutrition and age implying an increase prevalence of stunting after the 2nd year of life and increase in prevalence of underweight during the 1st year of life, while obesity and overweight clustered in the age range (4-5 yrs). Malnutrition also have high association with level of maternal education , higher prevalence of malnutrition(stunting ,wasting ,underweight) in illiterate mothers & lowest in highly educated ,while prevalence of over nutrition (obesity & overweight) were more in highly educated mothers and least in illiterate ones. The nutritional status of children under 5 years in Sulaimanya city seems to be satisfactory except for moderately high prevalence of wasting which requires further support to the child health through continuing the nutritional support offered to that area and promotion of maternal education regarding child health and nutrition.

دراسة سوء التغذية للأطفال تحت سن 5 سنوات في مدينة السليمانية

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المستخلص

دراسة انتشار انواع سوء التغذية في هذه المنطقة وعلاقتها ببعض المتغيرات (العمر ، الجنس ، نوع الرضاعة ، وقت إعطاء الغذاء التكميلي ، مستوى تعليم الام واخيرا عدد مرات الدخول الى المستشفى) . طرق البحث : هذه الدراسة اجريت في مدينة السليمانية بين (تموز-2005) الى (كانون الثاني-2006) ، النموذج جمع بشكل عشوائي من اربع مراكز صحية اولية في مدينة السليمانية ، وكان النموذج للفئات العمرية تحت خمس سنوات. العدد الكلي للأطفال الذي جمع كان 456 ، 256 (56.1%) كانوا ذكور ، 200 (43.9%) كانوا اناث . القصر ، النحول ، نقصان الوزن سجلت في 6.3% ، 6.1% ، 11.1% على التوالي بينما نسبة السمنة وفرط الوزن كان 7.6% و 3.5% على التوالي . العلاقات المهمة احصائيا كانت بين الانواع المختلفة من سوء التغذية والعمر مما يشير الى زيادة في انتشار القصر بعد السنة الثانية من الحياة وزيادة في انتشار نقصان الوزن اثناء السنة الاولى من الحياة بينما

السمنة وفرط الوزن تجمعت في الفئات العمرية 4-5 سنوات . علاقة تعليم الام كانت علاقة وثيقة ، لان نسبة سوء التغذية بالامهات الاميات كان اعلى بينما كان الاقل في الامهات ذوات التعليم العالي بينما انتشار السمنة وفرط الوزن كان اكثر في الامهات ذوات التعليم العالي واقل بالامهات الاميات مما اشار الى علاقة وثيقة بين تعليم الام والحالة التغذوية لاطفالهم . بشكل عام مقارنة هذه البيانات مع تصنيف اليونسيف يشير الى انه نسبة نقصان الوزن والقصر في مدينة السليمانية هو منخفض بينما نسبة النحول هو متوسط في الخلاصة الحالة التغذوية للاطفال تحت خمس سنوات في السليمانية تبدو انها مقنعة ماعدا نسبة متوسطة من النحول الذي يحتاج دعم اكثر لصحة الطفل عن طريق استمرار الاسناد التغذوي المقدم لهذه المنطقة ودعم توعية الامهات بالنسبة لصحة وتغذية الطفل .

Introduction

Malnutrition implies both under- and over- nutrition and is a consequence of both disturbance of energy balance between supply and demand ⁽¹⁾.

Approximately 12 million children below 5 years die each year, most of them in the developing countries, malnutrition (measured as poor anthropometric status) is an associated cause in about 1/2 of all deaths, occurring among children in developing countries ⁽³⁾. Growth assessment is an essential component of pediatric health surveillance because almost any problem within the physiologic, interpersonal and social domains can adversely affect growth ⁽⁴⁾. Obesity is a major pediatric health problem, for example in U.K. in 1996:11% of 6 years old and 17% of 15 years old were obese. Have many complications like cardiovascular, psychological , type II diabetes & so on. BMI is the simplest and most useful tool for assessing or monitoring overweight & Obesity.

Objective of study:

- 1- To study the frequency of underweight, stunting, wasting in children less than 5 years in Suleimany city and their relation to different variables.
- 2- To study frequency of obesity and overweight in the same sample and their relation to different variables.

Patients and methods

Four hundred and fifty six (456) children under 5 were randomly selected from (4)

primary health centers in Sulaimany city. The samples were collected during the period from (July -2005) to (January – 2006). Children with gross anomalies were excluded because they need special charts (e.g. patients with Down syndrome). Questionnaire form were used to collect data of age, sex, type of milk feeding during the 1st 6 months, time of introduction of complementary feeding, maternal education and previous hospital admission, Data were taken from mothers & were filled by the researcher. Children who were exclusively breast-fed for at least the 1st 6 months were assigned the title (breast feeding), while those who are completely bottle fed (bottle feeding). Mixed feeding is neither exclusive breast feeding nor exclusive bottle feeding. Grading of maternal education is regarded as follows:

- Illiterate: no education.
- Low education: unfinished secondary school.
- higher education: finished secondary school and above.

We depend in our nutritional assessment on the following anthropometric measures:

1. Weight: taken by a sensitive digital UNICEF Scale, with the patients wearing the lightest possible clothes results were taken to the nearest 0.1 kg.

2. Length: was measured to the nearest 0.1 cm using a measuring board (children above 2 years were measured standing up, while younger ones were measured lying down) with the children without shoes, results were taken to the nearest 0.1 cm. We depend in our evaluation of anthropometric measures on the "standard deviation" method or "Z" score⁽¹⁾. The data were compared to WHO reference data, the cutoff point for malnutrition was (-2) S.D. (Zscores) for each of the nutritional indices (wasting, stunting, underweight)⁽⁸⁾, ranking of nutritional indices were done following Carlson's classification⁽⁹⁾. For obesity: BMI > 95th percentile for age and sex were regarded as obesity, while values of between 85th and 95th percentile for age and sex were regarded as overweight.⁽¹⁾ Statistical analysis was done using Epi. Info. Software package, version 6. Data analyses were done by χ^2 test and Fisher's exact test.

P - Value < 0.05 was considered significant.

Results

Table 1 showed that the total number of children surveyed were (456), with 256(56.1%) were boys, 200(43.8%) were girls. Table 2 shows the distribution of sample according to the age-groups. The prevalence of nutritional indices in Sulaimany was as following:-

Table 3 shows that prevalence of underweight was (11.1%), (10.5%) in males and (12%) in females, while that of stunting is (6.3%), (5.8%) for males and (7%) for females, wasting prevalence was (6.1%), and for males

and females (5.4%) and (7%) respectively, it also shows that prevalence of obesity (7.6%) which is (8.2%) in males and (6.5%) in females, while overweight was (3.5%), which was (5%) in males and (1.5%) in females, so the under-nutrition parameters are slightly more in females and the over-nutrition parameters are slightly more in males, but this was non significant (P-value=0.250). Table 4 shows the prevalence of malnutrition in relation to different age groups, it shows more cases of underweight in the age group 0-12 months, while cases of stunting were more in the age range 37-48(12.3%) months and 13-24 months (9%). Wasting accumulate in two age groups: 13-24 months (12.9%), and 25-36 months (12.5%). Cases of obesity and overweight show extreme clustering in the older age groups, the highest for obesity was in the range 48-60 months (22%) and for overweight also the same age range (9.4%), this difference was statistically significant, P. value= 0.000001. Table 5 shows prevalence of malnutrition in relation to different types of milk: (49.5%) of mother exclusively breast fed their children (during at least the 1st 6 months), (16.4%) of the mothers used bottle feeding, (33.9%) were used mixed one. Prevalence of underweight was similar in those breast fed (14.1%) and those who are bottle fed (14.6%), prevalence of stunting was higher in babies who are breast fed (7.9%), while prevalence of obesity and overweight both are more in babies who are mixed fed (5.8%), with statistically significant difference (P. value= 0.00196). Table 6 shows prevalence of malnutrition in relation to time of introduction of complementary feeding: it shows that (65.6%) of children receive complementary feeding after 6 months

of age, while (34.4%) receive it before 6 months, however, there was no statistically significant difference (P.value =0.274). Table 7 shows prevalence of malnutrition in relation to maternal education: of mothers interviewed, (17.7%) were highly educated, (64.9%) were low educated, (17.3%) were illiterate, the relation to under nutrition parameters is striking, the incidence of underweight and wasting were much higher in illiterate mothers (25.3%), (18.9%) respectively,

while both obesity and over weight were significantly more in highly educated mothers (14.8%), (11.1%) respectively. The difference was statistically highly significant (P.value=0.000000). Table 8 shows the prevalence of malnutrition in relation to previous hospital admission, no difference was found in the parameters in relation to previous hospital admission, and it was statistically not significant (P.value=0.459).

Table (1):- Characteristics of studied population

Sex(gender)	Number	Percentage
Male	265	56.1%
Female	200	43.8%
Total	456	100%

Table 2:- Age distribution of the sample (Total no. 456)

Age(months)	Number	Percentage
0-12	131	28.7%
13-24	77	16.8%
25-36	40	8.7%
37-48	81	17.7%
49-60	127	27.8%

Table 3:- Distribution of malnutrition in Sulaimany city & their relation to sex.

Parameter	Males No. (%)	Females No. (%)	Total No. (%)
Underweight	27(10.5)	24(12)	51(11.1)
Stunting	15(5.8)	14(7)	29(6.3)
Wasting	14(5.4)	14(7)	28(6.1)
Obesity	22(8.2)	13(6.5)	35(7.6)
Overweight	13(5)	3(1.5)	16(3.5)
$\chi^2=5.38$ d.f.=4 P=0.250			

Table 4:- Distribution of malnutrition in different age groups.

Age in months	Sample size No. (%)	Underweight No. (%)	Stunting No. (%)	Wasting No. (%)	Obesity No. (%)	Overweight No. (%)
0-12 Month No. (%)	131(28.7)	24(18.3)	4(3.0)	8(6.1)	0	0
13-24 Month No. (%)	77(16.8)	12(15.5)	7(9.0)	10(12.9)	0	0
25-36 Month No. (%)	40(8.7)	3(7.5)	2(5.0)	5(12.5)	2(5.0)	0
37-48 Month No. (%)	81(17.7)	12(14.8)	10(12.3)	3(3.7)	5(6.1)	4(4.9)
49-60 Month No. (%)	127(27.8)	0	6(4.7)	2(1.5)	28(22)	12(9.4)
Total	456(100)	51	29	28	35	16
$\chi^2=112.7$ d.f.=16 P=0.000001						

Table (5):- Distribution of malnutrition in relation to the different types of milk feeding

PARAMETER	BREAST FEEDING	BOTTLE FEEDING	MIXED FEEDING	TOTAL
Sample No. (%)	226(49.5)	75 (16.4)	155(33.9)	456
Underweight No. (%)	32(14.1)	11(14.6)	8(5.1)	51
Stunting No. (%)	18(7.9)	3(4.0)	8(5.1)	29
Wasting No. (%)	16(7.0)	10(13.3)	2(1.2)	28
Obesity No. (%)	17(7.5)	4(5.3)	14(9.0)	35
Overweight No. (%)	6(2.6)	1(1.3)	9(5.8)	16
$\chi^2=24.4$ d.f.=8 P=0.00196				

Table (6):- Distribution of malnutrition in relation to time of introduction of complementary feeding.

parameter	<6 months	≥6 months	Total
Sample No. (%)	157(34.4)	299(65.6)	456
Underweight No. (%)	26(15)	25(8.3)	51
Stunting No. (%)	13(8.2)	16(5.3)	29
Wasting No. (%)	9(5.7)	19(6.3)	28
Obesity No. (%)	11(7.0)	24(8.0)	35
Overweight No. (%)	5(3.1)	11(3.6)	16
$\chi^2=5.13$ d.f.=4 P=0.274			

Table 7:- Distribution of malnutrition in relation to maternal education.

Parameter	High education	Low education	Illiterate	Total
Sample No. (%)	81(17.7)	296(64.9)	79(17.3)	456
Underweight No. (%)	0	31(10.4)	20(25.3)	51
Stunting No. (%)	3(3.7)	20(6.7)	6(7.5)	29
Wasting No. (%)	1(1.2)	12(4.0)	15(18.9)	28
Obesity No. (%)	12(14.8)	20(6.7)	3(3.7)	35

Overweight No. (%)	9(11.1)	7(2.3)	0	16
$\chi^2=56.7$ d.f.=8 P=0.000000				

Table (8):- Distribution of malnutrition in relation previous hospital admission.

Parameter	No admission	1-2 admissions	>2 admissions	Total
Sample No. (%)	254(55.7)	140(30.7)	62(13.5)	456
Underweight No. (%)	23(9.0)	23(17.1)	5(8.0)	51
Stunting No. (%)	11(4.3)	14(10.0)	4(6.4)	29
Wasting No. (%)	10(3.9)	16(11.4)	2(3.2)	28
Obesity No. (%)	19(7.4)	14(9.2)	2(3.2)	35
Overweight No. (%)	11(4.3)	4(2.8)	1(1.6)	16
$\chi^2=7.74$ d.f.=8 P=0.459				

Discussion

Nothing is more affectionate to us than our children, they represent both innocence and our own future, under fives were continuously exposed to noxious hazards of embargo & wars since 1980, so we need to establish our own standards of anthropometric measures to see the cumulative effects of these circumstances on our children's nutrition & well being, and to study if any improvement has occurred with

improving the political, socioeconomic, & local health measures. Iraq has been passing through the economic sanction since 1990; In general, Sulaimany City (and other region of Iraqi Kurdistan) was relatively spared from that embargo, but have regional conflicts at that time, however, since 1996, when regional conflicts had settled & the oil-for-food program was established, there was significant improvement in growth

parameters since that time. Overall, if we rank our study according to WHO classification ⁽⁹⁾, we found that both stunting (6.3%) & underweight (11.1%) are regarded as low prevalence, while wasting (6.1%) is regarded as medium, the current relatively higher incidence in wasting (which measure acute malnutrition) maybe explained by high rate of diarrheal diseases & acute respiratory infections. This is supported by the UNICEF 2001 study ⁽¹⁰⁾ which found incidence of diarrhea & respiratory disease in this region to be (25%) & (18%) respectively, also the same study found that some pockets of increase in acute malnutrition was found, especially during the hot summer season ⁽¹⁰⁾. The study also shows that there is no significant difference in frequency of malnutrition in relation to sex, this was found also in previous studies ⁽³⁾, but the relation to age group has some significant implications, underweight was more common in the age group (0-12 months), this maybe due to higher rate of infectious illness during this period, while stunting is more in the age group (13-24 months) & (36-48 months), this finding was similar to that in UNICEF 2001 study ⁽¹⁰⁾, also it was noticed by Al-Thamery study ⁽⁷⁾ whom attributed it to regional & ethnic factors. Over-nutrition is clustered in the age group (4-5 years); this appears to be the youngest age group where indices of obesity increase ⁽²¹⁾. Relation of under-nutrition to milk feeding is not such significant, while that of over-nutrition was observed more in mixed feeding babies, the explanation here may need further study, however, they may be taking excess nutrition from both sources (breast & bottle) in excess of their need and become obese infants that may become obese preschool

children. There was no relation of time of introduction of complementary feeding to the prevalence of malnutrition, the UNICEF 2001 study ⁽¹⁰⁾ found that frequency & quality of complementary feeding is more important which also need further study; however, the relation to maternal education was striking, all the 3 indices of under-nutrition were highest in illiterate mothers & lowest in highly educated mothers, while the indices of over-nutrition were highest in highly educated mother, this implies the important role of maternal education on children's health & nutrition & pushes itself as one of the primary factors to consider if we plan to improve nutritional status of our children in future. The rate of obesity & overweight (7.6%, 3.5%) is not much high if we compare it to the U.S.A study ⁽¹⁸⁾, it seems to be similar to some areas in Africa and Asia ⁽²⁰⁾, this may be related to the similar socioeconomic status & level of public health. Overall it seems there is no obesity problem in this area.

Conclusion

1. Prevalence of stunting and under weight is low in Sulaimany city, while that of wasting is moderate, which may be due to high prevalence of diarrheal and respiratory diseases in that area.
2. There is no obesity problem in this area.
3. There is high impact of maternal education on children's nutrition.

Acknowledgments

I am greatly thankful to my teacher and supervisor: Dr. Adnan M. Hassan, for his help and support.

I would like to express my gratitude to Dr. Haitham Issa Al-Banna (F.I.C.M.S.

/C.M.) for his great help regarding statistical aspects.

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