

Protein Energy Malnutrition in Iraqi Children before And After Five Years of the Sanctions

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Summary:

Background: Protein energy malnutrition (PEM) as a public health concept, is a world wide leading cause of death among children under 5 years of age.

Objective: The aim of the study is to evaluate the effect of the continuing 'sanctions on the morbidity and mortality of children with severe PEM admitted to central Teaching Pediatric Hospital in Baghdad.

Patients & methods: A retrospective study has been carried out to evaluate the effect of sanctions on the morbidity and mortality of children admitted to Central Teaching Pediatric Hospital in Baghdad. Cases with protein energy malnutrition (PEM) (marasmic Kwashiorkor), were recorded over a period of 18 months before the sanctions (between January 1989 and July 1990), and over another period 18 months after 5 years of the sanctions (between January 1995 and July 1996) to compares the results.

Results: Four hundred and forty patients with protein energy malnutrition (PEM) (marasmic 434 & 6 with Kwashiorkor) were recorded over a period of 18 months before the sanctions. The percentage of PEM to the total hospital admission (46703) was less than 1 %. After 5 years of sanctions, 1004 cases of PEM (marasmic 985 and 19 with kwashiorkor) were recorded and that accounted for more than 5 % of total hospital admission (21043). This represents about a three fold increment in the number of cases admitted after the sanctions. More than half of the cases were infants less than 6 months of age (57 %). This increase in the number of malnourished children was associated by a remarkable rise in mortality among them; 7.5% of total hospital mortality before the sanctions increased and 17.1 % after the sanctions.

Conclusion: This study clearly showed that sanctions imposed on Iraq have an increasingly detrimental effect on the nutritional status of Iraqi children. PEM of severe degree was expressed in all its forms (marasmus, kwashiorkor & marasmic kwashiorkor) has significantly increased and mortality has also increased.

Key words: Protein energy malnutrition (PEM), Iraqi children, sanctions

J Fac Med Baghdad
2005; Vol. 47, No.4
Received Jan. 2005
Accepted Oct.2005

Introduction:

Protein energy malnutrition (PEM) as a public health concept, includes marasmus, kwashiorkor, and the apparently intermediate disorders. World wide PEM is a leading cause of death among children under 5 years of age (1) according to the following widely accepted Welcome classification of PEM (2):

- (a) marasmus - weight below 60% of Boston median for age .
- (b) marasmus - kwashiorkor - weight below 60%, edema present.
- (c) Kwashiorkor • weight greater than 60%, edema present.
- (d) Under weight - weight 60-80 % no edema, (80% of the Boston median for age is about the third centile).

It is now generally accepted that factors other than just diet are involved in the etiology of PEM. Sever PEM may be considered an environmental disease(3) Many endocrine changes occur as a result of restrictions of glucose utilization in tissue(4) .The marasmic form of malnutrition results in more striking reduction in resting energy expenditure than that produced by kwashiorkor(5) . Cell-mediated immunity in PEM is generally depressed as shown by pathological thymic and lymphoid atrophy(6), lymphopenia, diminished delayed response to tuberculin skin test(8) ,and an abnormal in vitro lymphocyte studies(9). All PEM subjects have depressed concentrations of specific complement factors(10). Nutritional marasmus is the most common form of primary PEM(1), and it is due to eating very little of an otherwise well balanced diet(11) .

The earliest description of Kwashiorkor was made by professor Cialy Williams (12). Kwashiorkor supervene when the individual is exposed to a level of stress that exceed the body

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ability to cope (13), The vast majority of cases are in the one to four years age group and occasionally may be seen in infants aged a few months (12). Early malnutrition is usually associated with poor growth and development later (15). Computed Tomography shows that severe cerebral atrophy or brain shrinkage is associated with severe PEM (16). Studies also suggest that nutrition also contribute to improved verbal intelligence (17). The effect of malnutrition can be minimized by nutritional supplementation during the recovery period (18).

The aim of the study is to evaluate the effect of the continuing sanctions on the morbidity and mortality of children with severe PEM admitted to central Saddam Teaching Pediatric Hospital in Baghdad

Patients & Methods:

All infants and children with severe PEM were evaluated through a period of 18 months before the sanctions (between January 1989 and June 1990) and 18 months 5 years after sanctions (between January 1995 and June 1996). Infants and children with PEM were divided into two groups:

1 - Marasmus.

2 - Kwashiorkor & marasmic - kwashiorkor

Mild cases of undernutrition were excluded from the study. All patients with nutritional marasmus have the constant features of wasting of muscles and subcutaneous tissue and their weight were less than 60% of their expected weight for Boston median for age. All patients with kwashiorkor and marasmic-kwashiorkor have edema and under weight (even when there is edema), with or without dermatosis.

The diagnosis of Marasmus and kwashiorkor is a clinical one and is supported by laboratory investigations. Other causes of underweight or edema were excluded; none of the cases was secondary to any organic condition.

Results:

The total hospital admission before the sanctions was 46703 patients and the number of deaths among them was 1456, and their relative frequency percentage was (0.94 %). After the sanctions total hospital admission was 21043 and the number of deaths was 1668, their relative frequency percentage was (4.77 %) (Table 1).

The hospital admission of severe PEM patients before the sanctions was 440 patients; the case fatality rate was 25 %. After the sanctions, 1004 patients admitted with sever PEM, and the case fatality rate was more than 29.5 % (Table 1).

The mortality rate of PEM patients before the sanctions from the total hospital admission was

248 /100,000, after the sanctions it was 1359 /100,000 (Table 1).

Among 440 PEM patients before the sanctions, 434 were marasmic (98.6 %) and 6 with kwashiorkor (1.4 %). After the sanctions. 985 marasmic infants' were admitted (98.1 %) and 19 patients with kwashiorkor (1.9%) (Figure 1).

Of the 440 PEM patients before the sanctions, 320 patients aged 0-6 months (72.7 %), 47 patients 7-12 months (10.7 %), 43 patients 13-24 months (9.8 %), and 24 patients more than 24 months (5.4 %) (Figure 2).

After the sanctions, 1004 PEM patients were admitted: 572 patients aged 0-6 months (57 %), 201 patients 7-12 months (20 %), 158 patients 13-24 months (15.7 %) and 73 patients more than 24 months (7.3 %) (Figure 3).

Regarding the age distribution of the 6 patients with kwashiorkor before the sanctions, 5 patients aged 13-24 months (83.3 %) and 1 patient was more than 24 months old (16.6 %) (Figure 2).

Regarding the age distribution of the 19 patients with kwashiorkor admitted after the sanctions, 2 patients aged less than 12 months (10.5%), 6 patients aged 13-24 months (31.6 %) and 11 patients aged more than 24 months (57.9 %) (Figure 3).

The sex distribution of the 440 patients admitted with severe PEM before the sanctions; there were 253 males (57.5 %) and 187 females (42.5%). After the sanctions, males were 524 (52.2 %) and females were 480 (47.8 %) (Figure 4).

Discussion:

The study shows that the total hospital admission to Central Teaching Pediatric Hospital in Baghdad 18 months before the sanctions was more than twice the admission 5 years after sanctions during a period of 18 months. A.G. Al-Rawi (1992) (14) found that total admission to the same hospital for the 19 months before the sanctions was about 1.5 times of that 19 months immediately after the sanctions (49158 before the sanctions, 31134 after sanctions). These results reflect the deterioration in the health services provided to Iraqi children because of shortage of staff and medicine in addition to the closure of 3 units in the hospital, about 1/3 of the hospital capacity. The number of patients with PEM hospitalized before the sanctions was less than 1 % of the total hospital admission. 5 years after the sanctions, it was more than 5 %. A. G. al-Rawi (1992) found that the percentage of admission immediately after the sanctions was about 2.5 %.

The study provides firm evidence that the problem of severe PEM will continue to

increase because of the sanctions.

The mortality rate of patient with severe PEM from the total hospital admission before the sanctions has increased to 1359 / 100,000, while before the sanctions was 248/100,000 (Table 1). A.G. Al-Rawi (1990) found the mortality rate 19 months immediately after the sanctions was 709/100,000

Table 1: Number Of Patients Hospitalized 18 Months Before The Sanctions And 18 Months After 5 Years Of The Sanctions And The Case Fatality Rate Of PEM As Well As The Mortality Rate From The Total Hospital Admission.

	Total hosp. admission	No. of deaths	No. of severe PEM patients	No. of death severe PEM	Case fatality rate	Mortality rate
Before	46703	1456*	440	110	25%	248/100,000
After	21043	1668**	1004	286	29.5%	1359/100,000

*their relative frequency percentage 0.94%.

**their relative frequency percentage 4.77%.

The mortality rate shows a steady increase throughout the 5 years of sanctions in children with severe PEM in Iraq. Such arise can be due to the local shortage of antibiotics and other medical facilities as a result of the sanctions as well as malnourished infants have a significant impairment in the ability to resist infection (10). We found no significant difference in sex distribution of patients with severe PEM in the period before and after the sanctions (Figure 4). Figure 5 shows marked increase in the cases of kwashiorkor immediately after the sanctions (A.G. Al-Rawi 1992), and a significant decrease in the cases of kwashiorkor 5 years after the sanctions. A possible explanation is the over dependence on carbohydrate diets in feeding infants and children after weaning. Early after the sanctions mothers were using sugar and water solution widely to feed their infants since the sugar was widely available and relatively cheap. Later on, sugar became much more expensive and decreased such practices. This may have obliged mothers to utilize other dietary sources, which were cheaper and more beneficial to feed their infants and children leading decrement of kwashiorkor cases.

Figure 6 shows a linear increase in the number of marasmic patients from the period of 1990-1996.

Marasmus in the first 6 months of life is usually due to failure of breast feeding (1). In our study, we noticed an increasing in number of marasmic infants and children more than one year of age after the sanctions (Figure 2 &.3) and this is

similar to the results found by A.G. Al-Rawi 1992. This obviously reflects economic hardship and the unavailability of weaning food for young infants.

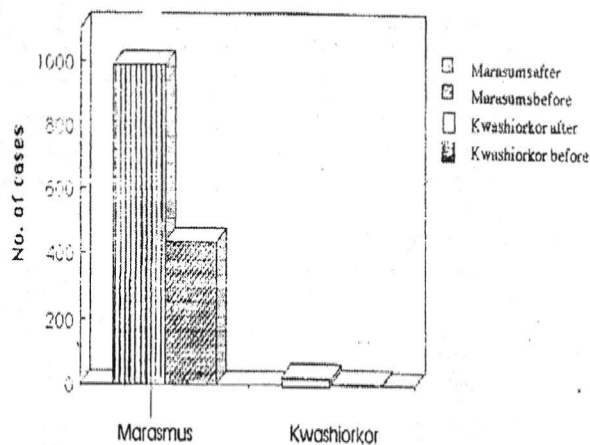


Figure 1: The total No. of PEM patients (Marasmus & Kwashiorkor) before & after the sanctions .

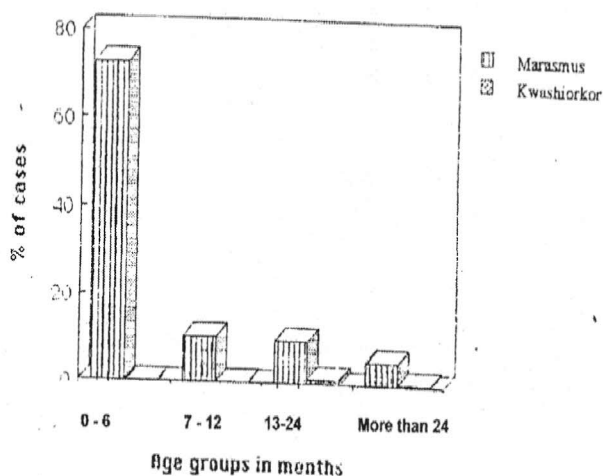


Figure 2: The frequency of age distribution of PEM patients before the sanctions .

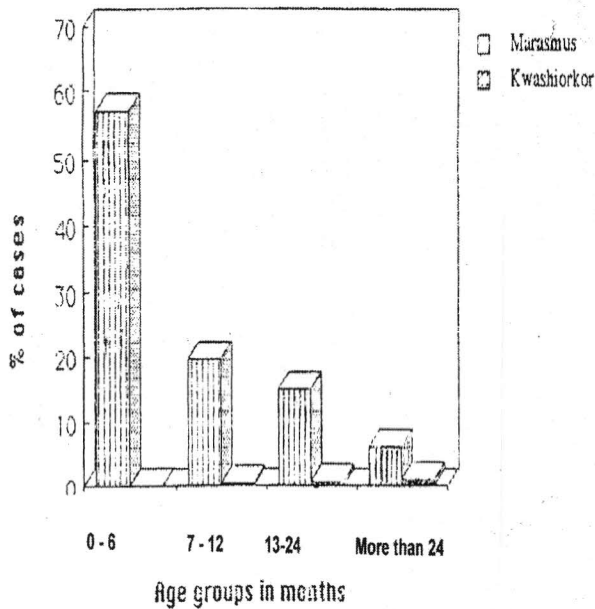


Figure 3: The frequency of age distribution of PEM patients after the sanctions .

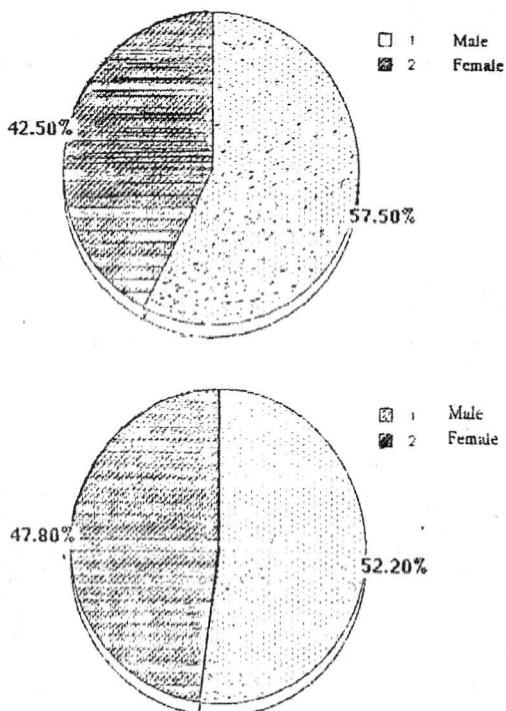


Figure 4: Sex distribution of PEM before and after the sanctions

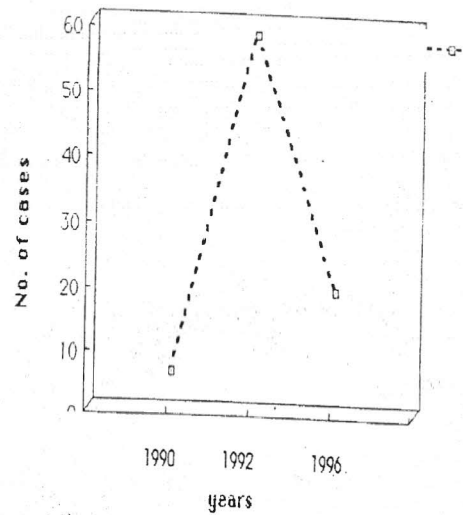


Figure 5: The distribution of Kwashiorkor cases before and after the sanctions .

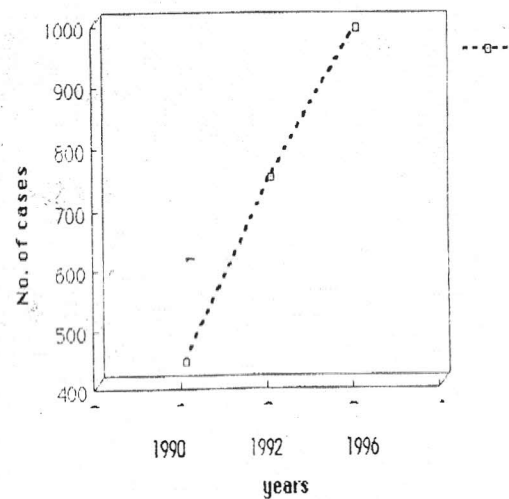


Figure 6: The distribution of Marasmus cases before and after the sanctions .

CONCLUSION

This study has clearly showed that sanctions imposed on Iraq for the last 5 years have an increasingly detrimental effect on the nutritional status of Iraqi children. PEM of severe degree expressed in all its forms (Marasmus, Kwashiorkor & Marasmic Kwashiorkor) has significantly increased and mortality has also increased.

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