Brief Reports

Dehydration in Kwashiorkor Cases: A Bad Prognosis Factor in Senegal

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Among the various forms of malnutrition, kwashiorkor, or oedematous malnutrition, constitutes an entity in itself. In fact, the simplicity of its clinical definition contrasts with the complexity of its aetiology and treatment.[1] In Senegal, kwashiorkor represents about 10 per cent of acute malnutrition and mortality is still very high. In infants hospitalized for acute infection, the mortality risk in the kwashiorkor-group was six times higher than in those presenting in a good nutritional state.[2] The purpose of this study was to assess the factors of bad prognosis in Senegalese children suffering from kwashiorkor.

The children were followed in the Pikine renutrition centre (Hôpital du Roi Baudouin) in a suburb close to Dakar. This centre works as an out-patient hospital: children are admitted daily from 8 a.m. to 6 p.m. accompanied by their mothers, and kept until recovery.[3] Upon admission children receive a vermifuge, malaria chemoprophylaxis and antibiotics. Correction and prevention of dehydration are achieved by means of oral intake of glucose-electrolytes solution according to the WHO protocol. Nutritional rehabilitation begins on day 1 and is based on a mixture of fermented milk, oil, and sugar. From October 87 through July 89, 58 kwashiorkor children were admitted to the Pikine nutrition centre; data were coded and analysed on microcomputer using statistical software. Forty-six children of this group (79 per cent) were followed until recovery (disappearance of oedema and recovery of a normal weight–height ratio); six children withdrew during treatment (10 per cent) and six died (10 per cent). In the analysis, deaths and withdrawals were grouped in the treatment failure category. Withdrawal occurred at D4, D6, D7, D13 (2), D14, and no information on outcome could be obtained; oedema had disappeared in three of them at withdrawal time. Deaths occured at D3, D5, D8 (2), D11, and D24.

Clinical characteristics of the children are shown in Table 1. Most of the children were 13–24 months of age and the age distribution is similar in both groups (recovery and failure); the mean age was 17 months. On the whole, sex distributions are similar and no significant difference between the groups is observed. More than 80 per cent of the children were weaned; in the failure group no child was breastfed. On admission, vomiting was present in more than one child out of three, with a higher percentage in the recovery group, but there was no significant difference between groups. Diarrhoea was very frequent (62 per cent) among the children of both groups. One child out of four had clinical dehydration at the time of admission, with a higher percentage in the failure group ($P<0.05$).

The analysis of anthropometric parameters at the time of admission does not reveal any significant difference between the two groups.

Our epidemological results on age, sex, and weaning match those observed in Senegal regarding circumstances of kwashiorkor development[4] and the clinical results confirm the aggravating role of electrolytic disturbance stemming from dehydration in acutely malnourished children.[5]

Regarding the evolution our protocol gives satisfactory results in 80 per cent of the cases; these results are comparable to those from Zaire where a similar protocol was used,[6] but are inferior to those from Jamaica.[7] Among the dead children, 5 out of 6 were dehydrated at admission and most of the deaths occurred in the first week of treatment due to cardiac failure. In addition to the immediate risk of dying of collapse and acidosis in dehydrated malnourished children, there is a secondary risk of dying of vascular overloading and cardiac decompensation in the early phase of treatment.[6]

Latent hypokalaemia in these children can be aggravated in the rehydration phase and may contribute to cardiac failure; this hypothesis is less probable in our cases, since children had received a supply of potassium (2 meq/kg/day).

An excess in caloric supplement during the early phase could also be the cause of cardiac decompensation;[7] the nutritive mixture used here has the same caloric content as that used in Jamaica, but the protein supplement was markedly higher here (3 g protein/100 ml versus 0.6 g/100 ml in Jamaica).

TABLE 1
Clinical parameters

Variables	All		Recovery		Failure		Test
	%	(*n*)	%	(*n*)	%	(*n*)	
Age							
6–12 months	19.0	(11)	17.4	(8)	25.0	(3)	
13–24 months	67.2	(39)	69.6	(32)	58.3	(7)	NS
25–36 months	13.8	(8)	13.0	(6)	16.7	(2)	
Sex							
Male	46.6	(27)	47.8	(22)	41.7	(5)	
Female	53.4	(31)	52.2	(24)	58.3	(7)	NS
Weaning							
Weaned	82.8	(48)	78.3	(36)	100.0	(12)	
Breastfed	17.2	(10)	21.7	(10)	0.0	(0)	NS
Vomoting							
Yes	37.9	(22)	43.5	(20)	16.7	(2)	
NO	62.1	(36)	56.5	(26)	83.3	(10)	NS
Diarrhoea							
Yes	62.1	(36)	63.0	(29)	58.3	(7)	
NO	37.9	(22)	37.0	(17)	41.7	(5)	NS
Dehydration							
Yes	25.9	(15)	19.6	(9)	50.0	(6)	
NO	74.1	(43)	80.4	(37)	50.0	(6)	$P<0.05$

NS = not significant.

The risk of water and salt retention in malnourished children can also contribute to cardiac decompensation during rehydration.[8] Oral rehydration therapy with the WHO solution have shown good results in marasmus accompanied by dehydration when a supplement of water is given and rehydration is conducted in a gradual manner.[9] Regarding dehydrated kwashiorkor cases, published studies are scarce; the best results seem to have been obtained in Jamaica with an oral solution containing 1.8 g/l of NaCl.[7] In our study, despite a supplement of pure water (two-thirds of WHO solution with one-third of water), results were very disappointing; a bad estimation of the dehydration level could have been the cause of cardiac failure by water and salt overloading.

Apart from water and electrolytic problems linked to dehydration, trace-elements deficiency can also influence the prognosis and a supplement for hospitalized kwashiorkor cases seems necessary.[10] A study of such an intervention is being carried out.

The death observed at D24 and the high percentage of withdrawals also underline the importance of the mother–child relationship in the development of kwashiorkor and the necessity of psychological help during hospitalization.[11]

In conclusion, our therapeutic results point to the need for further clinical studies, in order to more precisely determine the type of rehydration solution to be used in kwashiorkor cases, as well as the contents of nutritive mixtures to be used during the initial phase of treatment. Studies allowing a better estimation of the dehydration level in acute malnutrition cases are equally needed.

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Trial of Co-trimoxazole Versus Procaine Penicillin G and Benzathin Penicillin + Procaine Penicillin G in the Treatment of Childhood Pneumonia

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Summary

This study, which aimed to assess the results of three different regimens in the treatment of pneumonia, was carried out at the Pediatric Outpatient Department of Çapa Children's Hospital in Istanbul on 151 patients aged between 4 months and 14 years. The first group ($n=46$) received co-trimoxazole orally for 10 days and the second group ($n=63$) procaine penicillin G in intramuscularly for 10 days. Benzathin penicillin G combined with procaine penicillin G was given to the third group ($n=42$) as a single dose intramuscularly. While the best results were obtained with penicillin procaine G, no statistically significant difference was found between this regimen and co-trimoxazole therapy ($x^2=0.305023$ $P=0.5$). We suggest that co-trimoxazole is easy to administer and cost effective in the ambulatory treatment of pneumonia in children.

Introduction

Acute respiratory infections (ARI) constitute the most frequent cause of patient attendance and admissions to health services in both developed and developing countries.[1–3] Bacterial pneumonia as a primary infection or secondary to a viral infection is a leading cause of death in the under five age group in developing countries[1,2,4–9] and also in Turkey. Co-trimoxazole, procaine penicillin G, and benzathine penicillin G have all been recommended as effective and low cost drugs to be used in the standard ambulatory treatment of pneumonia in young children. Controlled trials comparing the effects of these therapeutic regimens are scarce.[6,10–13]. This study was planned to compare the outcome of pneumonia in three groups of patients receiving either co-trimoxazole for 10 days, procaine penicillin G for 10 days, or benzathine penicillin G combined with procaine penicillin G administered as a single dose.

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Patients and Methods

One-hundred-and-fifty-one children (56 girls, 95 boys), aged 3 months to 14 years (3.1 ± 2.7 years), who presented to the Çapa Children's Hospital Outpatient between November 1990 and March 1991 with signs of moderate pneumonia were included in the study. Criteria for exclusion were severe chest indrawing or wheezing, inability to eat and drink, moderate and severe malnutrition (weight for length ratio <80 per cent), and treatment with antibiotics within the previous 2 weeks. The children were classified by age groups as 3–12 and 13–59 months, and ≥ 5 years. Each patient's name, address, telephone number, age, weight, length, weight-for-length, axillary temperature, respiratory rate, abnormal breath sounds, and general conditions were recorded. A respiratory rate greater than 50/min for infants and greater than 40/min older children was accepted as tachypnoea. Leukocyte count and differential, sedimentation rate, tuberculin test, chest X-ray were carried out in all patients. The parents were asked to bring the child back daily during the first 5 days and again on the