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Nutritional status and mortality of refugee and resident children in a non-camp setting during conflict: follow up study in Guinea-Bissau

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Abstract

Objective To study the effects on children of humanitarian aid agencies restricting help to refugee families (internally displaced people).

Design Follow up study of 3 months.

Setting Prabis peninsular outside Bissau, the capital of Guinea-Bissau, which has functioned as a refugee area for internally displaced people in the ongoing war, and the study area of the Bandim health project in Bissau.

Participants 422 children aged 9-23 months in 30 clusters.

Main outcome measures Mid upper arm circumference and survival in relation to residence status.

Results During the refugee situation all children deteriorated nutritionally, and mortality was high (3.0% in a 6 week period). Rice consumption was higher in families resident in Prabis than in refugees from Bissau but there was no difference in food expenditure. Nutritional status, measured by mid-upper arm circumference, was not associated with rice consumption levels in the family, and the decline in circumference was significantly worse for resident than for refugee children; the mid-upper arm circumference of refugee children increased faster than that of resident children. For resident children, mortality was 4.5 times higher (95% confidence interval 1.1 to 30.0) than for refugee children. Mortality for both resident and refugee children was 7.2 times higher (1.3 to 133.9) during the refugee's stay in Prabis compared with the period after the departure of the refugees.

Conclusion In a non-camp setting, residents may be more malnourished and have higher mortality than refugees. Major improvements in nutritional status and a reduction in mortality occurred in resident and

refugee children as soon as refugees returned home despite the fact that there was no improvement in food availability.

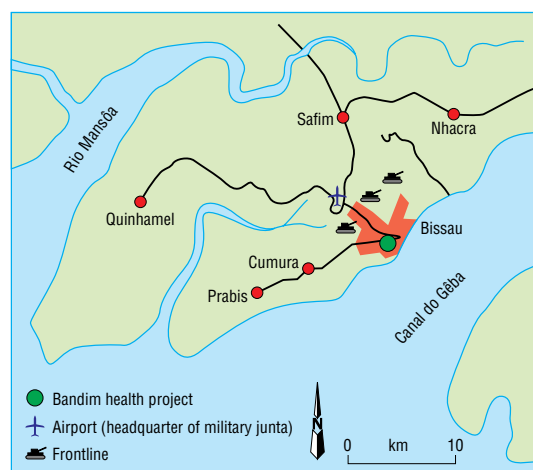
Introduction

The health of refugees and displaced people has been mainly studied in camp settings,¹⁻³ which has strongly influenced the way such people are treated. During the current crisis in Guinea-Bissau,⁴ there have been no camps¹; all refugees have lived with either relatives, friends, or strangers, and utilised their resources. The international emergency agencies, the World Food Programme and the International Committee for the Red Cross, however, restricted food aid to the estimated 350 000 refugees (internally displaced people). This was thought both unjust and unjustified by Guineans and local expatriates concerned with humanitarian aid. Since the policies of international and local organisations represent different understandings of the implications of the displacement of people, and since there has been little research on the consequences of non-camp settings, we examined health outcomes for both refugee and resident children.

Participants and methods

On 7 June 1998, armed conflict started in Guinea-Bissau between rebel soldiers (military junta) and the government army, which 3 days later received the support of troops from neighbouring countries Senegal and Guinea. The arrival of the foreign troops provoked a fully fledged war and the capital, Bissau, was shelled heavily by rebel artillery.

Nearly all 300 000 inhabitants of Bissau had fled the city by mid-June. Around 50 000 of the fleeing people took refuge just 5-15 km outside Bissau in the



Area surrounding Bissau, 1998: during the war major battles occurred along the road to the airport (the only road to the interior of Guinea-Bissau). Government and foreign troops had heavy artillery positions in the centre of the city, whereas rebel artillery was placed around the airport and at Cumur , south of Nhacra. Cars could only leave towards mission station in Cumura and the village of Prabis, two areas with major concentrations of refugees in Bissau. Exit from the Prabis area was only possible by canoe to Bijagos islands or by crossing the river to Quinhamel

villages on the Prabis peninsular (figure), an area that before the war had an estimated population of 6858.⁴ During the most intensive fighting, houses in Prabis had on average more than 100 inhabitants when both relatives and foreigners moved in to live with the owners. Many more people fled through Prabis (the only route for cars from Bissau), en route for the Bijagos islands or the interior by canoe. The first part of the war lasted from 7 June until the end of July, a ceasefire being agreed on 26 July. As soon as the fighting stopped, refugees from the Prabis area started returning to Bissau.

The first relief activity implemented by national health authorities was rice distribution from the World Food Programme's store in Bissau. After 3 weeks of conflict, we began surveying children aged 9-23 months to assess vaccination status,⁴ mid-upper arm circumference, and their family's rice consumption, food expenditures, and receipt of food aid.

We randomly selected 30 clusters, each with 14 children aged 9-23 months.⁴ (Inclusion of clusters is described in more detail on www.bmj.com.)

Of the 422 children included in our survey, 104 (25%) were residents in the Prabis area before the conflict; 130 (41%) were from the area normally covered by the Bandim health project⁵ and could be identified in the project's register.

We visited all the children again 3, 6, 9, and 12 weeks later until the last week of September. At each visit we measured mid-upper arm circumference to the nearest 2 mm.

A trained assistant conducted interviews with relatives of all deceased children to obtain a description of symptoms at death and to verify the quality of the death ascertainment.

We recorded the number of people in the household and whether they had received food aid within the past 3 weeks. Food distribution was started at the end of June. In the first round of food distribution for the refugees, the Red Cross provided

25 kg of rice, 8 litres of cooking oil, and 6 kg of corned beef per household for the first week. As there was no time to organise distribution according to the number of people in a family, an average household was assumed to comprise eight people. The 3 kg of rice per person per week was estimated on the basis of a recommended minimum consumption of 400 g of cereal per person per day. As the first distribution of rice in the Prabis area took 3 weeks, it was effectively a ration of only 133 g per person per week. In the second and third round of distribution in July and August, managed by the Bandim health project, households received food allowances according to the actual number of people in the household, and the ration of rice was gradually reduced to 133 g and 80 g, owing to the expected shortage of foodstuff for humanitarian aid. After the ceasefire on 26 July, the refugees started to return to Bissau, and food distribution was stopped in Prabis. Food distribution was continued in the project area in Bissau from the end of August, providing a daily allowance of 100 g of rice for a 3 week period. We managed to distribute only in three of the four districts in the area because the World Food Programme's food stock was depleted by the first week of September. (The statistical methods are described in more detail on www.bmj.com.)

Results

Mid-upper arm circumference and food consumption

At the first examination we found a major difference in the prevalence of mid-upper arm circumference measurements of less than 130 mm (low arm circumference) between refugee and resident children (table).

In the first round of food distribution carried out by the Red Cross in June 1998, a higher proportion of refugee families (41%, 123/299) than resident families (16%, 16/99) received food aid (relative risk 2.6, 95% confidence interval 1.6 to 4.0). In subsequent distributions organised by the Bandim health project, there was no difference for refugee children (87%, 85/98) and resident children (91%, 243/267) in coverage (1.1, 0.96 to 1.2). The members of resident households clearly had more rice available than members of refugee families from Bissau ($P < 0.001$), but there was no systematic difference in availability of money for purchasing additional foodstuff (table). Rice consumption for residents remained comparatively stable over time, decreasing by only 8 g (95% confidence interval -35 to 52) from the first to fifth visit; for refugees, consumption changed when they got back to Bissau showing a reduction of 76 g (36 to 116) from the first to fifth visit. Daily expenditures per person tended to increase for resident families between the first and fifth visit and to decrease for refugee families.

Although the children should have grown during the period of observation, there was a significant decline in mid-upper arm circumference for both resident and refugee children, the decline being stronger for resident than for refugee children (table). In a mixed model controlling for age, sex, cluster, and repeated measurements, the mid-upper arm circumference profiles were significantly different (test of interaction: $P = 0.003$). In the same model there was no association between mid-upper arm circumference

Crude prevalence of arm circumference <130 mm and mean rice consumption, food expenses, and upper arm circumference according to residence status in Prabis, Guinea-Bissau. Values are percentages (numbers) of children unless stated otherwise

Variable	Visit*				
	1	2	3	4	5
Low arm circumference (<130 mm)					
Residents	24 (23/97)	29 (28/97)	33 (26/79)	27 (21/77)	17 (13/78)
Refugees:					
Non-project	15 (27/178)	18 (24/133)	22 (11/50)	17 (3/18)	12 (2/17)
Project†	12 (14/121)	18 (18/99)	0 (0/19)	15 (16/108)	7 (8/109)
Mean rice consumption (g per family member per day)					
Residents	546 (96)	523 (95)	524 (75)	527 (75)	539 (65)
Refugees	450 (114)	472 (96)	510 (19)	380 (105)	372 (104)
Mean additional expenditure (CFA₣ per family member per day)					
Residents	191 (93)	216 (93)	211 (74)	199 (75)	244 (72)
Refugees	232 (112)	187 (94)	170 (19)	194 (104)	192 (108)
Mean mid-upper arm circumference (mm)					
Residents	139 (97)	135 (97)	135 (79)	136 (77)	139 (78)
Refugees (project†)	142 (121)	140 (99)	142 (19)	143 (108)	143 (109)
Growth (mm) for residents v refugees (95% CI)§		-1.7 (-3.6 to 0.1)	-4.9 (-8.0 to -1.8)	-3.6 (-5.9 to -1.3)	-1.2 (-3.6 to 1.2)

*Visit 1, after 3 weeks of conflict and first food distribution; visit 2, time of ceasefire agreement and after second food distribution; visit 3, after third food distribution when most refugees had left area; visit 4, early September when virtually all refugees had returned to Bissau where food was distributed; visit 5, end of September when no food distributed (lack of stocks).

†Children from study areas, Bandim 1, Bandim 2, Belem, and Mindará, who could be reidentified in population register. $\text{₣}100 \text{ CFA} = \text{£}0.10$.

§Difference compared with first visit.

and family rice consumption ($P=0.9$). Daily expenditures for food per person were positively related to higher values for mid-upper arm circumference but were not different for resident and refugee children (test of interaction: $P=0.6$).

Mortality

Over the 3 month period, the 104 resident children had a significantly higher mortality (seven deaths) than the 130 project children from Bissau (two deaths; mortality ratio 4.5, 1.1 to 30.0). Mortality was also much higher for resident and refugee children in the 6 weeks while refugees were in Prabis (eight deaths) compared with the last 6 weeks when the refugees had left (one death; 7.2, 1.3 to 133.9).

Discussion

Consequences of displacement

In the non-camp setting during the Guinean crisis, resident children aged 9-23 months suffered more than refugee children from Bissau; this age group is the most vulnerable to malnutrition, infections, and mortality. Hence, population displacement may have consequences for a wider group of people than is usually considered.^{2,3} A profound improvement in nutritional status and mortality occurred for both refugees and resident children once the refugees had left. The children coped better in their normal environment even though the rice consumption of refugee families decreased when they returned to Bissau.

In the present crisis, there has been no major deficiency in rice consumption for the population of Prabis. But, as virtually all children under 2 years of age are still breast fed and consume specially prepared porridges, it is unlikely that general food distribution will have a profound effect on childhood survival, as shown in our study.

Nutritional status seems more likely to be related to morbidity: exposure to infections and lack of treatment may be more important determinants of morbidity and mortality. With the extreme crowding⁶ and

unhygienic conditions that existed for the refugees in Prabis, it is not surprising that mortality was much higher for both residents and refugees while living under refugee conditions.

No simple explanation can explain why resident people were affected more than refugees. Refugee families are unlikely to have been a particularly privileged group. Furthermore, resident families seem to have been better off for rice availability, and there was no difference in expenditure for food consumption. We found no difference in measles immunisation between refugees and resident children.⁴ Duration of breast feeding differs little between urban and rural populations in Guinea-Bissau, although it might last longer in rural areas such as Prabis. Nutritional status is normally better in urban than rural areas, but the difference registered in July (table) was larger than usual, presumably reflecting that differential growth had already occurred during the first weeks of the war. The differential growth and mortality is presumably related to differences in health and treatment practices and in disease exposure. Resident children may have been more intensively exposed and exposed for a longer period because of their prolonged proximity to the refugee children.

Movement of refugees

Child mortality was much lower once refugee families had returned to their homes. Food distributions also affected refugees' travelling patterns—for example, many people remained in the Prabis area to receive the expected food aid, and we were effectively delaying their return by continuing to distribute in this area. In mid-August we transferred food distribution to Bissau to prevent people from continuing to live under unhealthy conditions. However, the World Food Programme, the main agency distributing food aid to Guinea-Bissau during the present crisis, continued to distribute in the interior of the country. Furthermore, United Nations safety regulations did not permit UN employees to stay in Bissau, making it more convenient to continue the operation in the interior of the country.

In the project area in Bissau, all refugees who had gone to Prabis had returned by the end of August, whereas many of those who had gone to areas where the World Food Programme continued distribution had yet to return by October.

Refugees and displaced people have been mainly studied in camp settings where effects may be different. Non-camp settings are, however, probably common in the early phases of emergencies before international agencies organise their programmes. In non-camp settings displacement is likely to lead to increased crowding and deterioration in hygiene and, consequently, to increased morbidity and mortality for both residents and refugees. The international agencies were clearly unaware of this possibility: they insisted on distributing aid only to refugees. It seems important also that concentrations of displaced people should be dispersed as quickly as possible. The most important consequences of general food distribution in an emergency situation may therefore not be the direct impact on nutritional levels but the indirect effects on movements and social behaviour, which have important consequences on exposure to disease. This requires humanitarian agencies to be aware of movement patterns and to be capable of following the population rather than vice versa.

Contributors: PA and IL planned the study. JG, MF, and QD organised and supervised data collection and food distribution. HJ carried out the statistical analyses. PA drafted the first version of the paper, and all authors contributed to the final version. PA and HJ will act as guarantors for the paper.

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Key messages

- During the war in Guinea-Bissau, most of the population fled from the capital and moved in with relatives, friends, or strangers
- International agencies insisted on only providing help to refugees (internally displaced people)
- During the first month of conflict, there were already profound effects on the nutritional status and mortality of young children
- Food consumption was higher in resident families, but resident children were more malnourished and had higher mortality than refugee children
- Nutritional status and survival improved for both refugee and resident children once the refugees returned to Bissau

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Prospective, randomised, double blind trial of prophylaxis with single dose of co-amoxiclav before percutaneous endoscopic gastrostomy

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Abstract

Objective To determine the efficacy of antibacterial prophylaxis in preventing infectious complications after percutaneous endoscopic gastrostomy.

Design Prospective, randomised, placebo controlled, double blind, multicentre study.

Setting Departments of internal medicine at six German hospitals.

Subjects Of 106 randomised adult patients with dysphagia, 97 received study medication, and 84 completed the study. The median age of the patients was 65 years. Most had dysphagia due to malignant disease (65%), and many (76%) had serious comorbidity.

Interventions A single intravenous 2.2 g dose of co-amoxiclav or identical appearing saline was given 30 min before percutaneous endoscopic gastrostomy performed by the thread pull method.

Main outcome measures Occurrence of peristomal wound infections and other infections within one week after percutaneous endoscopic gastrostomy.

Results The incidence of peristomal and other infections within one week after percutaneous endoscopic gastrostomy was significantly reduced in the antibiotic group (8/41 (20%) v 28/43 (65%), $P < 0.001$). Similar results were obtained in an intention to treat analysis. Several peristomal wound infections were of minor clinical significance. After wound infections that required no or only local treatment were excluded from the analysis, antibiotic prophylaxis remained highly effective in reducing clinically important wound infections (1/41 (2%) v 11/43 (26%), $P < 0.01$) and non-wound infections (2 (5%) v 9 (21%), $P < 0.05$).

Conclusions Antibiotic prophylaxis with a single dose of co-amoxiclav significantly reduces the risk of infectious complications after percutaneous endoscopic gastrostomy and should be recommended.

Introduction

Percutaneous endoscopic gastrostomy is commonly used for long term enteral feeding of patients with

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