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A prospective survey of the outcome of pregnancy in a rural area of the Gambia*

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The outcome of pregnancy was studied in 672 women over a 1-year period in a rural area of the Gambia where medical resources were very limited, prior to the introduction of a primary health care programme. Maternal mortality was very high (22 per 1000), mainly caused by postpartum haemorrhage and infections. Stillbirth and neonatal death rates were also high (35 and 65 per 1000, respectively); prematurity and infections were the main causes of death in neonates. First or late pregnancies, ages under 20 or over 40 years, and multiple pregnancies were all associated with a poor outcome of pregnancy. Women in these groups should therefore be encouraged by traditional birth attendants and by the staff of rural antenatal clinics to deliver in a health centre or hospital.

Despite wide recognition that in rural Africa pregnancy is a hazardous time for both mother and child (*1*), there are few data quantifying the degree of risk. Most of the information about maternal mortality is related to hospital-based surveys although, in many rural areas, few women deliver in a hospital or health centre, even when there have been complications during the pregnancy. In these circumstances, most stillbirths and early neonatal deaths occur at home and information on the outcome of pregnancies can be obtained only by asking these women about their past obstetric history or, more accurately, by making direct observations if this should be possible. Few such prospective studies have been undertaken. In Machakos, Kenya, direct observations on the outcome of pregnancy in 4716 rural women over a 4-year period (1975–78) indicated a relatively favourable outcome and maternal mortality was low (*2*).

In the Gambia, demographic records in two villages, Keneba and Manduar, showed a high perinatal mortality which changed little during a 25-year period of observation from 1951 to 1975 (*3*). Since 1975, a paediatrician and a midwife have been working in Keneba and infant and childhood mortalities declined dramatically (*4*). Keneba and Manduar now no longer reflect the situation prevailing in the other rural areas of the country. In 1980 the government's Medical and Health Department embarked on an ambitious primary health care programme to establish a village health worker (VHW) and a traditional birth attendant (TBA) in every village with a population of 400 or more. As a baseline for future assessments of the effects of this programme on maternal and infant mortality a survey was carried out on the course and outcome of pregnancy in women living in a rural area with very limited medical resources. We tried to identify the risk factors for a poor outcome of pregnancy which could help TBAs and the staff of rural antenatal clinics to select pregnant women who require special care.

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MATERIALS AND METHODS

Study area

The study was undertaken in 41 villages and hamlets near the town of Farafenni in North Bank Division; the nearest village was 12 km and the furthest was 35 km from Farafenni. There are no

tarred roads in the area but all the study villages are accessible by laterite roads throughout the year. An occasional taxi travels between the larger villages and Farafenni but at the time of this survey the residents of more isolated villages could reach the town only by foot, bicycle, horse or donkey cart. The geographical and climatic features of the area have been described elsewhere (*5*).

At the time of this survey, from April 1982 to March 1983, the medical resources of the Farafenni area were very limited. The medical facilities of the town comprised a government dispensary, manned by a dresser-dispenser and a midwife, one private medical practitioner, and a number of small pharmacies. Fortnightly maternal and child health clinics were held in two villages situated 16 km to the west and 20 km to the east of Farafenni. Expectant mothers had to travel up to 20 km to reach one or other of these clinics. Patients seen at the Farafenni dispensary who required further treatment had to be sent across the river by ferry to Banjul, a journey of nearly 200 km, which could take several hours.

Study population

The population in the study area belonged to three ethnic groups, Mandinka, Wollof and Fula, with Mandinka predominating. Heads of households were mainly subsistence farmers, the women being responsible for most of the rice cultivation which is very arduous during the latter part of the rainy season. A house-to-house enumeration in November and December 1981 indicated that the total population of the study villages and hamlets was 12 313 of whom 2800 were women aged 15–45 years. Only 4% of women in the child-bearing age had had any formal education.

Identification of pregnant women

Two methods were used to identify pregnant women.

(*a*) An individual was appointed in each village and hamlet to be responsible for recording all births and deaths in the village and to identify all pregnant women. This information was given to one of a team of MRC-employed field assistants who were each responsible for data collected in a group of villages and hamlets.

(*b*) At the start of the surveillance period, which was from April 1982 to March 1983, urine samples were collected for pregnancy testing from all women in the reproductive age group (15–45 years) excluding those who had delivered during the preceding 12 months. Approximately 90%-coverage was achieved. Urine tests were repeated in September 1982 before the second clinical survey.

Once a woman had been identified as pregnant, she was visited by a field worker with an initial antenatal questionnaire concerning her previous obstetric history. The intervals between births and the proportion of children surviving were calculated from data collected retrospectively in this way.

Monthly surveillance

Each woman identified as pregnant was visited once a month by a field worker with a morbidity questionnaire concerning current complaints and visits to a health facility during the preceding month. On completion of the questionnaire the oral temperature was measured, using an electronic thermometer, and if this was $\geqslant 38.0$ °C a blood film was obtained. If a woman was found to have delivered during the period since the last visit, a final questionnaire was completed, concerning where the delivery had occurred, who had assisted, and the outcome.

Clinical surveys

On two occasions, once during the dry season (March 1982) and once at the end of the rainy season (October/November 1982), all the women who were known to be pregnant were examined in their village by the same physician, and their weights and heights were recorded. Completion rates of over 95% were obtained for each survey. A fingerprick blood sample was taken for parasitological, haematological and serological measurements and a urine sample was collected for chemical analyses. Treatment was given for any illness identified during the survey. All women found to have a positive serological test for syphilis were treated with penicillin.

Identification of maternal and infant deaths

The number of abortions, stillbirths, early neonatal and maternal deaths were recorded by the field assistants who presented the postnatal questionnaire. Deaths later in the neonatal period were detected during the course of a survey into the causes of infant and early childhood deaths in the study area. When a stillbirth or a maternal or infant death was reported to the project epidemiologist a visit to the household was made by a physician and a detailed history obtained from the family of the events that had led up to the death. This information, supplemented by any clinic records that were available, was used to try to determine the most likely cause of death.

Laboratory methods

Urine was tested for protein and sugar.[a] Pregnancy tests were carried out using a simplified version of a commercial latex agglutination test;[b] by using only 20 μl of each reagent, dispensed with a micropipette, it was possible to carry out approximately 40–50 tests with each 1 ml of reagent.

Thick blood films were stained with Giemsa; 100 high-power fields were scanned before a film was considered to be negative. The erythrocyte volume fraction was measured with a microhaematocrit centrifuge.

Sera were tested for syphilis using a rapid plasma reagin (RPR) card test[c] as a screening procedure. Sera found positive by the RPR test were tested by the more specific treponemal haemagglutination (TPHA) test;[d] agglutination at a dilution of 1:80 or more was considered positive in the TPHA test. Tetanus antibodies were measured by a passive haemagglutination assay. Antibodies to rubella were determined by a radial haemolysis assay;[e] sera which gave an area of haemolysis equal to or greater than that of the positive control were considered positive. Antibodies to cytomegalovirus (CMV) were determined by immunofluorescence using MRC 5 cells infected with the AD 169 strain of virus. An anti-whole-immunoglobulin fluorescein conjugate was used. In this assay sera which gave fluorescence at a titre of 1:2 or greater were considered positive. Antibodies to malaria and to toxoplasma were measured by ELISA tests. For the malaria assay an antigen prepared from placentae infected with *Plasmodium falciparum* was employed. An IgG peroxidase conjugate was used. For the toxoplasma test a commercial antigen preparation[f] was employed and both IgG and IgM alkaline phosphatase conjugates were used. Sera which gave an absorbance of 0.2 or greater in an ELISA were considered positive. Sera were screened for hepatitis B surface (HBs) antigen using a haemagglutination assay.[d]

RESULTS

Outcome of pregnancy

During the 1-year surveillance period, 789 pregnant women were identified; 108 of them were still pregnant at the end of the survey and 9 had moved out of the study area. Thus, the outcome of pregnancy was known for 672 women. Maternal deaths, stillbirths and neonatal deaths were all frequent (Table 1). Only a few abortions were recorded but this figure is almost certainly an underestimate as few women reported their pregnancy until after the first trimester.

Table 1. The outcome of pregnancy in 672 women in a rural area of the Gambia during the period April 1982 to March 1983

Outcome	Number	Rate per 1000[a]
Maternal death	15	22.3
Intra-uterine death	4	—
Abortion	15	—
Stillbirth	23	34.9
Early neonatal death (< 1 week)	26	40.9
Late neonatal death (1–4 weeks)	15	23.6
Total: neonatal death	41	64.6
Perinatal death	49	74.5

[a] The stillbirth and perinatal death rates are calculated per total births (658); the neonatal death rates per live births (635). Maternal deaths are defined as deaths during pregnancy, delivery, or within 6 weeks of delivery, which were related to the pregnancy.

Maternal deaths

Fifteen women died from a cause that was probably related to pregnancy. The mean age of the mothers who died (28.5±8.0 years) was very similar to the mean age of 657 pregnant women who survived (27.3±6.4 years). Death occurred more frequently among primigravidae (2 out of 7; 286 per 1000) and among women who had 5 or more previous pregnancies (8 out of 176; 45 per 1000) than among women who had had 1–4 previous pregnancies (5 out of 420; 12 per 1000) ($\chi^2=6.5$; 2 df; $P<0.05$). Only one woman died in hospital, two died on the way to hospital, and the remainder died at home. Eleven women had attended an antenatal clinic at least once during their pregnancy. Likely cases of maternal death are shown in Table 2; postpartum haemorrhage was the most important, being responsible for five deaths (33%). Infections were responsible for another four deaths and sudden collapse at or shortly before delivery for a further three. Eight women gave birth to a live child, including one pair of twins. All these 9 children died before reaching the age of 1 year.

[a] Labstix from Miles Laboratories (Ames Division), Slough, England.

[b] Prognostician from Organon Teknika, Cambridge, England.

[c] Hynson, Westcott & Dunning; Becton Dickinson (UK) Ltd, Oxford, England.

[d] Burroughs Wellcome, Wellcome Diagnostics, Dartford, Kent, England.

[e] Rubascreen from Northumbria Biologicals, Northumberland, England.

[f] Virion from Dynatech Laboratories, Billinghurst, Sussex, England.

Table 2. Features of 15 maternal deaths in rural Gambian women

Age (years)	Parity	Antenatal clinic visits	Probable cause of death	Person assisting at delivery	Place of delivery	Place of death	Time of death (after delivery)	Outcome[a]
33	3	2	Postpartum haemorrhage	Untrained TBA	Home	Home	4 hours	Stillbirth
22	2	0	Amenorrhoea for 3 months, severe abdominal pain, collapse	No one	—	Roadside	—	Intrauterine death
40	6	3	Postpartum haemorrhage	Relative	Home	Home	1 hour	Live born, died 3/52
36	5	2	Postpartum haemorrhage with retained placenta	Relative	Next-door compound	Next-door compound	1 hour	Live born, died 3/52
28	6	3	Sepsis and jaundice	Relative	Home	Home	4 days	Live born, died 3/52
30	8	1	Anaemia, heart failure, chronic renal failure	Trained midwife	Hospital	Home	8 weeks	Twins, liveborn, died 1/12 and 3/12
26	6	2	Hepatic coma	Trained midwife	Hospital	Home	5 days	Live born, died 10/7
30	6	4	Tuberculosis	Relative	Home	Home	2 weeks	Live born, died 6/12
41	12	1	Postpartum haemorrhage	Relative	Home	Home	4 hours	Stillbirth
21	3	1	Premature delivery, convulsions	Relative	Home	Home	5 weeks	Stillbirth
34	5	1	24 weeks' gestation, acute toxic illness, ? *S. typhi*	No one	—	Home	—	Intrauterine death
34	3	2	36 weeks' gestation, sudden severe abdominal pain	No one	—	Home	—	Intrauterine death
21	1	0	36 weeks' gestation, sudden weakness and collapse	Untrained TBA	—	Roadside	—	Intrauterine death
16	0	0	Sudden death at delivery, ? amniotic fluid embolus	Untrained TBA	Home	Home	Instant of delivery	Live born, died 6/52
16	0	0	Postpartum haemorrhage	Untrained TBA	Home	Home	1 hour	Live born, died 1/12

[a] 10/7 = at 10 days; 3/52 and 6/52 = at 3 and 6 weeks; 1/12, 3/12 and 6/12 = at 1, 3 and 6 months.

Stillbirths and neonatal deaths

Twenty-three stillbirths and 41 neonatal deaths were recorded. Fig. 1 shows the stillbirths and neonatal deaths by month of death. The stillbirth rate showed little change with season but significantly more neonatal deaths occurred during the 6 months of the rainy season and immediate post-rainy season (June–November) (32/343 live births) than during the dry 6 months of the year (December–May) (9/288 live births) ($\chi^2 = 8.9$; 1 df; $P < 0.01$). Twenty-four of the 41 neonatal deaths occurred in males and 17 in females.

Information on the circumstances of death was obtained for 38 of the 41 infants who died during the neonatal period. Only 7 (18%) died in a hospital or health centre and only 11 (29%) had received any

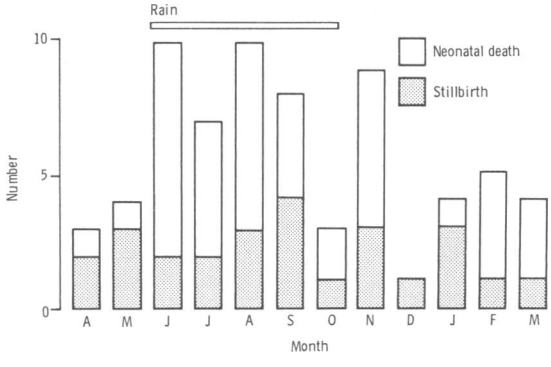

Fig. 1. Number of stillbirths and neonatal deaths recorded among 672 pregnant Gambian women every month from April 1982 to March 1983.

form of western medicine for their final illness. Presumptive causes of death established by post-mortem questionnaire and by examination of record cards are shown in Table 3. Prematurity was the main cause of death in 12 infants, including a pair of twins and a set of triplets. Nine of these 12 infants died within the first 48 hours of life. Feeding problems accounted for the deaths of 5 further infants. Infections were the main cause of death among infants who survived the first week of life (10/15 deaths). A total of 13 neonates probably died from an infection; 5 probably had pneumonia, 4 a generalized septicaemia associated with septic skin lesions, 1 meningitis, 1 neonatal syphilis, 1 acute gastroenteritis and 1 neonatal tetanus. The mother of the latter child had not been immunized.

Table 3. Presumptive cause of death in 41 infants who died during the first month of life

Cause of death	Number
Prematurity and death at <1 week	12
Nutritional problems and failure to thrive	5
Birth trauma	1
Congenital abnormalities	1
Infection	13
No obvious cause	6
No information obtained	3
Total	41

Factors influencing the outcome of pregnancy

Four of the 672 women had multiple pregnancies, comprising 3 sets of twins and 1 set of triplets. Only 4 of these 9 infants survived the neonatal period and only 2 reached the age of 1 year.

Factors influencing the outcome of pregnancy were assessed for 649 women with a singleton pregnancy whose outcome was known, excluding those who had an abortion or intra-uterine death. The results of these comparisons are summarized in Table 4. The outcome of pregnancy was influenced by both age and parity. A poor outcome (stillbirth or neonatal death) was recorded significantly more frequently in women aged less than 20 years and in those 40 years old or more than in women aged 20–39 years ($\chi^2=10.9$; 3 df; $P<0.05$). Neonatal mortality was especially high in those aged 40 years or more (5/24). A poor outcome was recorded more frequently in primigravidae and in multigravidae than in those with 1–4 previous pregnancies ($\chi^2=11.7$; 2 df; $P<0.01$). The outcome of pregnancy was not influenced by ethnic group. A higher proportion of women whose pregnancy ended in a stillbirth had a history of a previous stillbirth than did women whose pregnancy ended in a live birth (7/16 compared with 135/458) but this difference is not statistically significant ($\chi^2=2.4$; 1 df; not significant). The mean duration between the onset of the index pregnancy and the previous pregnancy was similar in women with a bad outcome of pregnancy (41.2±14.7 months) and in those with a good outcome (38.0±14.9 months). However, 29 women whose previous child had died had a significantly shorter birth interval (26.6±12.7 months) than did 357 women whose previous child was still alive (mean birth interval, 38.0±14.9 months) ($t=4.0$; $P<0.001$).

The proportion of women who had an antenatal card and who were known to have visited an antenatal clinic on at least one occasion during their pregnancy did not differ significantly between women with a good outcome of pregnancy (436/590; 74%) and those with a bad outcome (41/59; 69%). Ninety percent of women who had an antenatal card had a record of administration of at least one dose of tetanus toxoid during the current or previous pregnancies; the

Table 4. Risk factors for a poor outcome of pregnancy (stillbirth or neonatal death), based on a study of 649 women with a singleton pregnancy

Statistically significant risk demonstrated	Data suggestive but not statistically significant	No risk demonstrated
First pregnancy	Previous stillbirth	Symptoms in pregnancy
Five or more previous pregnancies	Short stature, high weight	Oedema, raised blood pressure
Age: <20 years	Prolonged labour	Abnormal erythrocyte volume fraction
Age: >40 years		
Chloroquine administration in pregnancy		Malaria parasitaemia
		Positive serology for syphilis

level of tetanus immunization did not differ between the two groups. An antenatal card record of chloroquine administration during the current pregnancy was noted significantly more frequently among women with a bad outcome of pregnancy (8/41) than among those whose child survived the neonatal period (26/436) ($\chi^2=8.4$; 1 df; $P<0.01$).

Field workers completed an average of 2.9 monthly morbidity questionnaires both for women with a good outcome of pregnancy and for those with a bad outcome. Complaints were frequent in both groups (fever, abdominal pain, weakness, swelling of the feet, and dysuria in descending order of frequency) but no symptom differed significantly in prevalence between the two groups. An oral temperature of 38.0 °C or greater was recorded at the time of administration of morbidity questionnaires on only 8 of the 1813 times when temperature was recorded. Only two of these women had malaria parasitaemia. All 8 febrile women had a good outcome of pregnancy.

A cross-sectional clinical survey of all pregnant women in the study area carried out on two occasions during the study period was not helpful in identifying risk factors for a poor outcome of pregnancy. An abnormal fetal position was detected in 26 out of 307 women with a palpable fetus but only one of these 26 pregnancies had a bad outcome. Oedema was noted in 11 out of 35 women (31%) with a bad outcome and in a similar proportion of women with a good outcome (155/433; 36%). Systolic hypertension (140 mmHg or greater), diastolic hypertension (90 mmHg or greater) and proteinuria were all found infrequently and were recorded in 17, 26 and 11 out of 475 women, respectively. Only 3 women had hypertension and proteinuria; 1 had a stillbirth. Glycosuria was not detected. Trends towards a higher stillbirth rate in short women (1.5 m or less) and towards a higher neonatal death rate among women in the heaviest decile were observed but, overall, the outcome of pregnancy was not influenced significantly by height or weight.

Blood was collected for haematological, parasitological and serological determinations during each clinical survey. Malaria parasitaemia was found in 3/37 women (8%) with a bad outcome of pregnancy and in 29/422 (7%) of those with a good outcome. The mean erythrocyte volume fraction of 31 women with a poor outcome of pregnancy (32.8±3.6) was very similar to that in 353 women with a good outcome (32.2±4.4). No difference between groups was found when the comparison was restricted to the 155 women seen during the last trimester. All 25 women with an erythrocyte volume fraction of 25 or less had a good outcome of pregnancy.

The results of serological investigations carried out on 237 blood samples obtained from 254 pregnant women during the first clinical survey are shown in Table 5. Few differences were observed between women with a good and bad outcome of pregnancy. A higher IgM titre of toxoplasma antibodies was found in the mothers of infants who died in the neonatal period but no other significant differences were found. Although positive serological tests for syphilis were frequent, these did not not predict a bad outcome for the pregnancy. Because of this rather

Table 5. Results of serological tests in 237 pregnant women in relation to the outcome of their pregnancy

Antibody test[a]	No. of children alive at 1 month	Outcome of pregnancy: Stillbirth or early neonatal death	Outcome of pregnancy: Late neonatal death
Syphilis:			
RPR	57/214 (27)[b]	3/16 (19)	1/7 (14)
RPR + TPHA	29/214 (14)	1/16 (6)	1/7 (14)
Toxoplasma:			
IgG	133/195 (68)	7/15 (47)	6/6 (100)
IgM	24/195 (12)	1/15 (7)	3/6 (50)
CMV	200/209 (96)	13/15 (87)	6/6 (100)
Rubella	197/208 (95)	15/16 (94)	6/6 (100)
Malaria	213/214 (100)	16/16 (100)	6/6 (100)
HBs antigen	30/193 (16)	4/16 (25)	2/6 (33)

[a] See text for details.

[b] Figures in parentheses are percentages.

surprising finding these tests were also carried out on a further 221 samples collected during the second clinical survey. Once again, no correlation with the outcome of pregnancy was found. The prevalence of HBs antigen was about twice as high in women with a poor outcome of pregnancy as in those with a good outcome, but the numbers were small and this difference is not statistically significant. Mean titres of toxoplasma, malaria and CMV antibodies did not differ between women with a poor outcome of pregnancy and those with a good outcome.

Information on the circumstances of delivery was obtained by questionnaire for 59 women with a bad outcome of pregnancy and for 590 women with a good outcome. The proportion of women delivered by a midwife in a health centre or hospital was low and was similar in each group (5% and 4%, respectively). Histories of prolonged labour, excessive bleeding and tearing were all given more frequently by women with a bad outcome of pregnancy than by women with a good outcome, but none of the differences between the two groups is statistically significant.

DISCUSSION

In this study we tried to identify all the pregnant women in a group of 41 villages and hamlets in North Bank Division of the Gambia during a one-year period and to determine the outcome of their pregnancies. We believe that by using a combination of registration methods and urine tests on all at-risk women very few pregnancies were missed. Very high maternal, stillbirth and perinatal death rates were recorded. We have found few other comparable sets of data, collected during the course of community surveys in Africa, with which to compare our findings. In a comprehensive survey of the relationship between fertility, birth intervals and fetal mortality, Armagnac & Retel-Laurentin (*6*) recorded an abortion rate of 210 per 1000 and a stillbirth rate of 50 per 1000, respectively, in a rural area of Burkina Faso. In the relatively prosperous Machakos area of Kenya, Voorhoeve et al. (*2*), using survey techniques similar to our own, found a stillbirth rate of 30 per 1000, a neonatal death rate of 23 per 1000 and a maternal death rate of only 0.8 per 1000, a figure 30 times lower than that recorded in our study. In the Gambia, a study carried out in the villages of Keneba and Manduar over a 25-year period from 1951 to 1975 gave stillbirth rates of 64 and 89 per 1000, neonatal mortality rates of 85 and 50 per 1000, and maternal mortality rates of 11 and 10 per 1000, respectively (*3*). Thus, our data suggest that there has been little or no improvement in the outcome of pregnancy in the rural areas of the Gambia during the past few years. The maternal death rate in the Farafenni area is about 200 times greater than that recorded in industrialized countries, the neonatal death rate 5–10 times higher, and the stillbirth rate about 3 times higher.

The maternal mortality rate recorded in our study is very high, even by the standards of other developing countries, e.g., a mortality of 1 per 1000 live births in Jamaica (*7*). Caution is required in making generalizations from the findings obtained in a restricted population during a survey period of only one year, but our findings suggest that in rural Gambia as many of 1 out of 8 women still die in pregnancy or in childbirth. Only 2 of the 15 women who died had been seen in a hospital or health centre during their final illness so that maternal death rates based on hospital or health centre records would have grossly underestimated the size of the problem. Even before the introduction of a new primary health care programme, rural health services in the Gambia were relatively effective, as shown by the high proportion of pregnant women seen in our study who had attended an antenatal clinic and received tetanus immunization. It is likely that in some other parts of Africa where rural health programmes are less well developed, maternal mortality is at least as high as in the Gambia.

To try to determine the ways by which these maternal deaths might have been prevented, we obtained as much information as possible about each woman who died. In 11 of the 15 cases death occurred either before or within 4 hours of delivery and was associated with haemorrhage or sudden collapse. Because of lack of transport and the absence of resuscitation facilities at the nearest dispensary it is unlikely that these deaths could have been prevented. Although 11 of the 15 women who died had been seen at least once at an antenatal clinic, none had been referred to a health centre for delivery.

The stillbirth rate among Farafenni women was not especially high and was similar to that reported in the more prosperous community of Machakos, Kenya (*2*). A history of a previous stillbirth was obtained more frequently from women whose pregnancy ended in a stillbirth than in women with a successful outcome of pregnancy and it is our clinical impression that in the study community there are several women who experience recurrent stillbirths. A number of possible infective causes of stillbirth were considered. Malaria was unlikely because no seasonal variation in the incidence of stillbirths was observed and, in the Gambia, malaria is very seasonal. Although a high prevalence of positive antibody tests for syphilis was found, this infection did not appear to be as significant a cause of stillbirths as in rural Burkina Faso (*6*) and urban Zambia (*8*).

Deaths among neonates fell into two main groups. Prematurity was the main cause in infants who died during the first few days after birth, and infection was the main cause of death in neonates who survived the first week of life. A history suggestive of death from neonatal tetanus was given by only one family, which accords with the high prevalence of tetanus antibodies in pregnant Farafenni women. Maternal death was an important cause of neonatal and infant mortality. All 9 children born to mothers who died failed to reach the age of 1 year. A maternal death is thus, almost inevitably, a double tragedy.

We tried to identify risk factors that might help traditional birth attendants and midwives working in rural antenatal clinics with few facilities to identify at-risk pregnant women who might benefit from delivery in a health centre. Because our sample size was relatively small, only risk factors exerting a strong effect would have been detected. As expected, we found that primigravidae, women with 5 or more previous pregnancies, women over the age of 40 years, or women with multiple pregnancies were all at risk. Our attempts to detect other risk factors were unsuccessful. Monthly administration of morbidity questionnaires by field staff, together with the measurement of temperature, did not provide any helpful indicators. Examination of each pregnant woman by a physician on one occasion during pregnancy was also unhelpful; very few women had any signs of pre-eclampsia or other recognized risk factors. Determination of the erythrocyte volume fraction and serological tests for a variety of infections known to cause congenital infections were, in the main, unhelpful although a tendency to a poorer outcome was noted in women who were HBs antigen positive. Thus, it is likely that in the Farafenni area the outcome of pregnancy is determined largely by obstetric factors and that infections such as malaria and syphilis, which might be amenable to specific interventions, do not play a major role in causing stillbirths or neonatal deaths. From data in Table 2 it is clear that in many of the maternal deaths the attendants at delivery had no possibility of alleviating the problem. Transport from outlying villages is extremely difficult to obtain in an emergency and at the time of this study, the Farafenni Health Centre had inadequate staff and facilities for dealing with obstetric disasters. The Government Hospital in Banjul, the nearest place with blood transfusion and obstetric services, is reached only after a journey of several hours, including crossing of the River Gambia by ferry. Consequently the importance of identifying the at-risk mother well before delivery should be emphasized and training given to TBAs and visiting midwives who conduct antenatal clinics in the health centres. Mothers at risk must be encouraged to attend the health centre nearest to them for delivery, transport facilities should be improved, and a place should be made available for mothers to stay near a health centre prior to delivery. Whenever possible, major health centres should be upgraded to include blood transfusion facilities and the services of an obstetrician.

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RÉSUMÉ

GAMBIE: UNE ENQUÊTE PROSPECTIVE SUR L'ISSUE DES GROSSESSES DANS UNE RÉGION RURALE

L'issue des grossesses a fait l'objet d'une étude dans une région rurale de Gambie disposant de ressources médicales très limitées, avant introduction d'un programme de soins de santé primaires. Cette étude visait également à identifier les facteurs de risque pouvant être utilisés par les accoucheuses traditionnelles et le personnel des dispensaires ruraux de soins prénataux pour sélectionner les femmes enceintes nécessitant des soins particuliers.

On a enregistré pendant un an (1982–1983) l'issue des grossesses de 672 femmes habitant 41 villages et hameaux situés aux environs de la ville de Farafenni, sur la rive nord du fleuve Gambie, à 100 km de la côte. Les femmes enceintes ont été identifiées soit par les agents des villages, soit grâce aux analyses d'urine effectuées à deux reprises au cours de la période d'étude chez toutes les femmes âgées de 15 à 45 ans. Par conséquent, il est peu probable que de nombreuses femmes enceintes aient échappé à l'étude. Un agent de terrain leur a rendu visite une fois par mois jusqu'à leur accouchement et, à deux reprises au cours de l'année, toutes celles qui étaient présentes ont été examinées dans

leur village par un médecin.

Le taux de décès maternel enregistré a été de 22 pour 1000, ce qui est très élevé. Les primipares et les femmes ayant déjà mené au moins cinq grossesses présentaient un risque plus élevé de décès. Hémorragies et infections ont été les principales causes de décès maternel. Neuf enfants vivants sont nés de 15 mères décédées. Tous ces enfants sont décédés avant d'atteindre l'âge d'un an. On a enregistré 23 mortinaissances et 41 décès néonatals (taux de mortinatalité, 35 pour 1000; taux de décès néonatal, 65 pour 1000). Les principales causes de décès des nourrissons morts au cours de la première semaine ont été la prématurité et ses complications, les décès des nourrissons ayant survécu à cette période étant essentiellement consécutifs à des infections.

On a recherché les facteurs ayant eu une influence sur l'issue de la grossesse chez 649 femmes ayant mené une grossesse simple. L'âge comme la parité ont eu une influence sur cette issue, qui a été le plus souvent défavorable (mortinatalité ou décès néonatal) chez les femmes très jeunes et les femmes âgées. Les enquêtes de morbidité n'ont été d'aucune utilité pour identifier les femmes à risque et peu d'anomalies ont été décelées au cours des enquêtes transversales menées par un médecin. L'issue de la grossesse n'était pas liée au volume globulaire. On a trouvé une forte prévalence de la séropositivité dans les épreuves de dépistage de la syphilis et de l'hépatite B. On a observé que l'issue de la grossesse avait tendance à être défavorable chez les femmes HBsAg-positives, mais non chez les femmes séropositives pour la syphilis.

Il est probable que dans la zone d'étude, l'issue des grossesses est largement déterminée par des facteurs obstétricaux et que les infections telles que paludisme et syphilis, que l'on peut corriger par des interventions spécifiques, ne constituent pas une cause importante de mortinatalité ou de décès néonatal.

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