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Management of women with mild and moderate cervical dyskaryosis

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Abstract

***Objective*—To compare the outcomes in women with mild and moderate dyskaryosis after increasing periods of surveillance and thereby to define a rational protocol for managing such women.**

***Design*—Prospective study with randomisation of women to one of four treatment groups, each with a different period of surveillance; one group in which the women were given immediate treatment and three other groups in which the women were under surveillance for six, 12, and 24 months.**

***Setting*—A dedicated colposcopy clinic in Aberdeen, Scotland.**

***Subjects*—902 women who presented with a mildly or moderately dyskaryotic smear for the first time.**

***Interventions*—Cytological and colposcopic examinations at intervals of six months until the allocated period of surveillance was completed, at which time biopsy was performed. Women with severe dyskaryosis were withdrawn from surveillance and a biopsy was performed.**

***Main outcome measures*—The histological findings after punch biopsy or large loop excision of the transformation zone, and the trends in cytological appearances of serial cervical smears.**

***Results*—793 women completed the study. In all, 769 women had an adequate final smear, of which 197 were normal cytologically, 328 were still mildly or moderately dyskaryotic, and 244 were severely dyskaryotic. Seventeen of the 67 (25%) women with one repeat smear showing non-dyskaryosis had cervical intraepithelial neoplasia grade III compared with only one of the 31 (3%) women with no dyskaryosis in four repeat cervical smears ($P < 0{\cdot}0001$). None of the women had invasive cancer. Of 158 women whose index smear showed mild dyskaryosis and who were allocated to the group under surveillance for two years, only 40 had not defaulted or still had dyskaryotic smears by the end of the two years.**

***Conclusion*—Cytological surveillance, although safe, is not an efficient strategy for managing women with mildly abnormal smears. Women with any degree of dyskaryosis in a smear should be referred for colposcopy.**

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Introduction

The purpose of a cervical cytology screening programme is to reduce both the mortality from and the incidence of carcinoma of the cervix by detecting and eradicating the preinvasive lesion, cervical intraepithelial neoplasia grade III. These aims can be fully realised only if women with cervical cytological abnormalities are managed in the most appropriate way. Although it is widely accepted that women with severe cytological abnormalities (severe dyskaryosis) should be referred for colposcopic assessment and biopsy, uncertainty exists about the best way to manage women with milder cytological abnormalities (mild or moderate dyskaryosis), who accounted for 3·2% of 1·7 million smears taken in England and Wales in 1991 (M Weston, national coordinating network cervical screening programme, personal communication). Consequently, the mangement of these abnormalities has important implications, not only for women but also for health resources.

The traditional policy of cytological surveillance, which evolved in the days before colposcopy was developed, is based on the belief that many of the milder abnormalities will spontaneously revert to normal over time[1] and reserves referral for colposcopy for women with severe dyskaryosis or persistent mild or moderate dyskaryosis. The realisation that cervical intraepithelial neoplasia grade III is present in up to one third of women with mild or moderate dyskaryosis[2-4] led to the suggestion that all women with any degree of dyskaryosis should be referred for colposcopic assessment. The advantages of this approach are that it enables a prompt histological diagnosis and avoids the possibility of the patient defaulting on a further smear test. These benefits may be achieved, however, at the risk of both overtreatment and increased anxiety for some women.[5] Of 210 health districts investigated in a survey by the British Society of Colposcopy and Cervical Pathology, 37% had a policy of immediate colposcopic referral for a single mildly dyskaryotic smear and 45% for a single moderately dyskaryotic smear. Recent guidelines on the management of women with such smears suggest immediate referral for colposcopy for women with a single moderately dyskaryotic smear and referral after two consecutive dyskaryotic smears for women with mild dyskaryosis.[7] In addition, the report recommended that women should re-enter the routine screening programme only after two further smear tests, six months apart, have yielded negative results.

The lack of reliable information on the natural course of these disorders lies at the centre of this debate about management. Previous studies[1 8-11] had methodological problems, which makes interpreting their results difficult.[12] The methodological problems included inconsistent criteria for entry, unrepresentative populations, a lack of baseline histological data, inadequate follow up, and the potential interference of a biopsy in the natural course of the disease. Four retrospective studies of outcome in women with mild cytological abnormalities showed reversion to normal in 24-60% of cases.[1 10 11 13] These studies reported that up to 25% of women defaulted from surveillance and that the incidence of cervical cancer increased even in women who did not default. The need for large randomised prospective studies of colposcopy to resolve this important problem has been emphasised.[14]

In August 1989 we began to investigate the cyto-

logical trends after the detection of mild and moderate dyskaryosis by comparing prospectively the outcome in relation to different periods of surveillance. An earlier report from our project documented the prevalence of cervical intraepithelial neoplasia grade III at entry into the study and indicated that social criteria were not useful predictive factors for identifying women whose smear tests yield mildly abnormal results and who have underlying cervical intraepithelial neoplasia grades II and III.[15] We report here the completed prospective study.

TABLE I—*Sociodemographic characteristics for 902 women with mildly or moderately abnormal index smears. Values are numbers (percentages) of women*

	Group				
	Immediate diagnosis and treatment (n=227)	Six months' surveillance (n=225)	12 Months' surveillance (n=223)	24 Months' surveillance (n=227)	Significance
Index smear:					
Mildly dyskaryotic	145 (63·9)	160 (71·1)	158 (70·9)	158 (69·7)	
Moderately dyskaryotic	82 (36·1)	65 (28·9)	65 (29·1)	69 (30·4)	
		Sociodemographic factors			
No of women	190	195	196	206	
Age (years):					
≤20	28 (14·7)	24 (12·3)	20 (10·2)	34 (16·5)	χ^2=17·67, df=9, P=0·04
21-	112 (58·9)	121 (62·1)	146 (74·5)	133 (64·6)	
36-	41 (21·6)	42 (21·5)	28 (14·3)	35 (17·0)	
>50	9 (4·7)	8 (4·1)	2 (1·0)	4 (1·9)	
No of pregnancies:					
0	70 (36·8)	64 (32·8)	74 (37·8)	70 (34·0)	χ^2=16·89, df=15, P=0·33
1	45 (23·7)	49 (25·1)	51 (26·0)	43 (20·9)	
2	37 (19·5)	40 (20·5)	35 (17·9)	36 (17·5)	
3	21 (11·1)	29 (14·9)	26 (13·3)	35 (17·0)	
4	6 (3·2)	8 (4·1)	6 (3·1)	16 (7·8)	
≥5	11 (5·8)	5 (2·6)	4 (2·0)	6 (3·0)	
No of partners:					
1	37 (19·5)	37 (19·0)	26 (13·3)	33 (16·0)	χ^2=10·05, df=12, P=0·61
2	37 (19·5)	39 (20·0)	40 (20·4)	43 (20·9)	
3	37 (19·5)	50 (25·6)	44 (22·4)	37 (18·0)	
4	26 (13·7)	21 (11·0)	31 (15·8)	27 (13·1)	
≥5	53 (27·9)	48 (24·6)	55 (28·1)	66 (32·0)	
Cigarette smoking:					
Non-smoker	68 (35·8)	71 (36·4)	62 (31·6)	61 (29·6)	χ^2=5·62, df=6, P=0·46
Ex-smoker	19 (10·0)	26 (13·3)	18 (9·2)	25 (12·1)	
Smoker	103 (54·2)	98 (50·3)	116 (59·2)	120 (58·3)	

Data on sociodemographic factors were available on 787 women.

TABLE II—*Description of protocol and histological outcome for 902 women and four study groups to which they were randomised. Values are numbers (percentages) of women*

	Group			
	Immediate diagnosis and treatment (n=227)	Six months' surveillance (n=225)	12 Months' surveillance (n=223)	24 Months' surveillance (n=227)
Protocol	Repeat smear, colposcopy, and biopsy	Six months' colposcopic and cytological surveillance before biopsy	12 Months' colposcopic and cytological surveillance before biopsy	24 Months' colposcopic and cytological surveillance before biopsy
No of visits	1	2	3	5
Women who defaulted	0 (0%)	22 (9·8)	34 (15·2)	53 (23·3)
Women who were withdrawn*	0 (0%)	33 (14·7)	50 (22·4)	83 (36·6)
Women who completed protocol	227 (100%)	170 (75·6)	139 (62·3)	91 (40·1)
Histological findings in women who were withdrawn or completed protocol:	227 (100)	203 (90·2)	189 (84·8)	174 (76·7)
Cervical intraepithelial neoplasia:				
Absent	35 (15·4)	70 (34·5)	50 (26·5)	57 (32·8)
Grade I	34 (15·0)	32 (15·8)	32 (16·9)	22 (12·6)
Grade II	51 (22·5)	37 (18·2)	32 (16·9)	19 (10·9)
Grade III	107 (47·1)	64 (31·5)	75 (39·7)	76 (43·7)

*Did not complete allocated period of surveillance because of severe dyskaryosis.

TABLE III—*Cytological appearance of final smear in relation to index smear in 769 women who either completed study or were withdrawn and whose final smear was adequate. Values are numbers of women (percentages of index smears)*

	Final smear			
Index smear	No dyskaryosis (n=197)	Mild dyskaryosis (n=187)	Moderate dyskaryosis (n=141)	Severe dyskaryosis (n=244)
Mild dyskaryosis (n=520)	154 (29·6)	157 (30·2)	81 (15·6)	128 (24·6)
Moderate dyskaryosis (n=249)	43 (17·3)	30 (12·0)	60 (24·1)	116 (46·6)

χ^2 for trend=50·69, df=1, P<0·001.

Patients and methods

The smears of all women screened in Grampian are processed in the same cytology laboratory. Between August 1989 and July 1991 all women whose first abnormal cervical smear (index smear) was mildly or moderately dyskaryotic were seen at a dedicated colposcopy clinic and invited to participate in this study. The women's informed consent was obtained, and all eligible women were randomised by serial allocation to one of four groups. In one group the condition was diagnosed (on biopsy) and treated immediately while in the three others (the surveillance groups) a smear test and colposcopy were performed at six months; at six and 12 months; and at six, 12, 18, and 24 months.

At the first visit the women were asked by the colposcopist to complete a questionnaire documenting basic sociodemographic data. At each subsequent visit the women had a cervical smear test and were examined colposcopically. The timing of the biopsy for histological investigation depended on the group to which the women had been allocated (see table II). The method used was large loop excision of the transformation zone, but this was preceded by a directed punch biopsy if a distinct lesion was seen. The histological grade was taken as the worse of the findings on punch biopsy or large loop excision. The women were withdrawn from the surveillance protocol and treated immediately if severe dyskaryosis developed or if colposcopy showed possible microinvasion. These women were included in the analysis. Women who refused to attend the clinic despite two invitations and women who became pregnant were classed as defaulters. The cervical smears were classified according to the British Society for Clinical Cytology's terminology and the guidelines for adequacy of cervical smears.[16] The smears were reported by a cytotechnician and a cytopathologist (EMFM).

The data were computerised and analysed with the statistical package for social sciences (SPSS). The χ^2 test was used to compare categorical variables, and the χ^2 test for trend was used to assess the association between variables with ordered categories.[17] A probability level of 0·05 was regarded as significant.

Results

In all, 902 women entered the study, of whom 621 presented with mild dyskaryosis in the index smear and 281 with moderate dyskaryosis. The women's ages ranged from 18 to 62 (mean 31·1 years). Two hundred and twenty seven women were randomised to the group of women who were given immediate diagnosis and treatment, 225 to the six month surveillance group, 223 to the 12 month surveillance group, and 227 to the 24 month surveillance group. The proportions of mild and moderate dyskaryosis did not differ among the groups. The sociodemographic questionnaire was completed by 787 women (table I).

Six hundred and twenty seven women completed the protocol, 166 were withdrawn because of a severely dyskaryotic smear, and 109 defaulted from the study. The reasons given for defaulting were a lack of interest in continuing the study (37), pregnancy (19), and change of address (10); no explanation was given by 43 women. The overall proportion of women who were withdrawn from the study because of severe dyskaryosis increased with increasing periods of surveillance (table II).

Table III shows the cytological outcome for the 769 women who did not default and whose final smear was adequate. One hundred and ninety seven of these women finished the study with a smear showing no dyskaryosis (classed as reversion to normal cytological findings), 328 finished with persistent mild or moderate

TABLE IV—*Histological outcome in relation to index smear in 793 women who either completed study or were withdrawn. Values are numbers of women (percentages of index smears)*

	Histological outcome			
		Cervical intraepithelial neoplasia		
Index smear	No cervical intraepithelial neoplasia	Grade I	Grade II	Grade III
Mild dyskaryosis (n=538)	158 (29·4)	92 (17·1)	101 (18·8)	187 (34·8)
Moderate dyskaryosis (n=255)	54 (21·2)	28 (11·0)	38 (14·9)	135 (52·9)

χ^2 for trend = 18·5, df = 1, P < 0·0001.

TABLE V—*Cytological appearance of final smear in 769 women who either completed study or were withdrawn and whose final smear was adequate, according to study group. Values are numbers (percentages) of women*

	Group			
Final smear	Immediate diagnosis and treatment (n=214)	Six months' surveillance (n=199)	12 Months' surveillance (n=185)	24 Months' surveillance (n=171)
No dyskaryosis	67 (31·3)	58 (29·1)	41 (22·2)	31 (18·1)
Mild or moderate dyskaryosis	109 (50·9)	84 (42·2)	83 (44·9)	52 (30·4)
Severe dyskaryosis	38 (17·8)	57 (28·6)	61 (33·0)	88 (51·5)

χ^2 for trend = 38·02, df = 1, P < 0·001.

TABLE VI—*Association between cytological appearance of repeated smears and histological findings in 769 who either completed study or were withdrawn and whose final smear was adequate. Values are numbers of women (percentages of final smears)*

	Cervical intraepithelial neoplasia			
Final smear	No cervical intraepithelial neoplasia (n=203)	Grade I (n=114)	Grade II (n=136)	Grade III (n=316)
No dyskaryosis (n=197)	91 (46·2)	48 (24·4)	33 (16·8)	25 (12·7)
Persistent mild or moderate dyskaryosis (n=328)	89 (27·1)	53 (16·2)	74 (22·6)	112 (34·1)
Severe dyskaryosis (n=244)	23 (9·4)	13 (5·3)	29 (11·9)	179 (73·4)

χ^2 for trend = 168·27, df = 1, P < 0·0001.

TABLE VII—*Prevalence of cervical intraepithelial neoplasia grade III in relation to number of consecutive non-dyskaryotic smears. Values are numbers of women (percentages of repeat smears)*

	No of repeat smears showing no dyskaryosis			
	1 (n=67)	2 (n=58)	3 (n=41)	4 (n=31)
Women with cervical intraepithelial neoplasia grade III (n=25)	17 (25)	5 (9)	2 (5)	1 (3)
Women with no cervical intraepithelial neoplasia or with cervical intraepithelial neoplasia grade I or II (n=172)	50 (75)	53 (91)	39 (95)	30 (97)

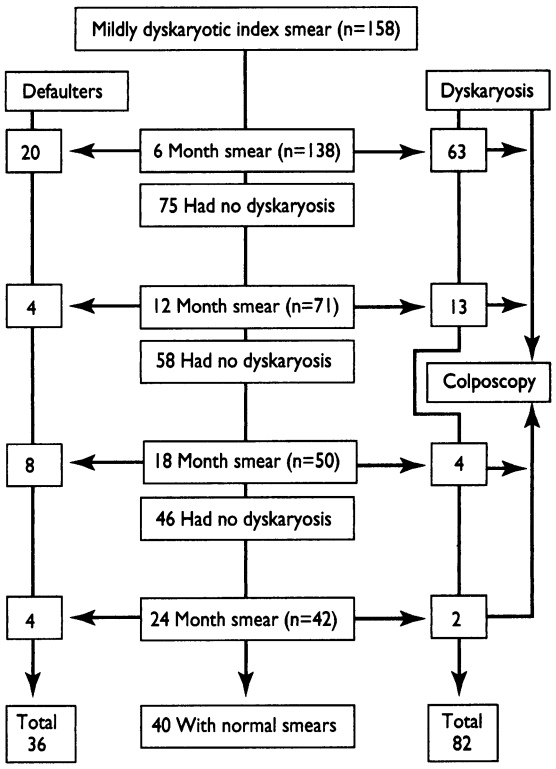
χ^2 for trend = 12·36, df = 1, P < 0·001.

dyskaryosis, and 244 finished with severe dyskaryosis. Twenty four women had an inadequate smear. Women who had presented with moderate dyskaryosis were significantly more likely to have subsequent severe dyskaryosis and less likely to revert to having normal cytological findings than women who had presented with mild dyskaryosis (χ^2 for trend, P < 0·001) (table III). Women who had presented with moderate dyskaryosis were also significantly more likely to have cervical intraepithelial neoplasia grade III than women who had presented with mild dyskaryosis (χ^2 for trend, P < 0·0001) (table IV). The likelihood of a smear showing no dyskaryosis or persistent mild or moderate dyskaryosis decreased with increasing numbers of repeat smears whereas the likelihood of a smear showing severe dyskaryosis increased with increasing numbers of repeat smears (table V).

The histological diagnoses arising from punch biopsy and large loop excision of the transformation zone were compared in the 678 women in whom both types of biopsy were performed. Cervical intraepithelial neoplasia grade III was diagnosed in significantly more specimens from large loop excision of the transformation zone (250) than specimens from the punch biopsy (162), (P < 0·0001). The absence of cervical intraepithelial neoplasia was more often diagnosed only in punch biopsy specimens (339) than in specimens from large loop excision of the transformation zone (203) (P < 0·0001). Overall, cervical intraepithelial neoplasia was diagnosed in 581 women (grade III in 322, grade II in 139, and grade I in 120). The proportion of women with cervical intraepithelial neoplasia grade III did not differ significantly between those who were given immediate diagnosis and treatment and those who were under surveillance for 24 months (table II). The proportion of the women in the 24 month surveillance group who did not have cervical intraepithelial neoplasia (57/174 (32·8%)) was double the proportion in those who were given immediate treatment and diagnosis (35/227 (15·4%)); this higher proportion seems to be due to the fact that low grades of cervical intraepithelial neoplasia later reverted to normal in some women.

Table VI shows the association between the trend in cytological appearances and the histological findings: women whose smears reverted to normal were more likely to have no cervical intraepithelial neoplasia and less likely to have cervical intraepithelial neoplasia grade III than women whose smears showed severe dyskaryosis (P < 0·0001). The more consecutive non-dyskaryotic smears that a woman had, the less likelihood there was of underlying cervical intraepithelial neoplasia grade III (χ^2 for trend, P < = 0·001) (table VII).

To evaluate the outcome of a surveillance policy based on recent guidelines[7] we studied the outcome for each of the 158 women with an index smear showing mild dyskaryosis who had been allocated to the group under surveillance for 24 months (figure). The number of women who neither had defaulted nor had persistent dyskaryosis fell from 75 at six months to 40 at 24 months.



Outcome in women who were under surveillance for 24 months, according to guidelines set by the national coordinating network of the NHS cervical screening programme.[7]

Discussion

The management of women with mild cytological abnormalities should be safe, effective, and cost efficient and should minimise both the risk of invasive cancer and the overtreatment of women who do not have clinically important disease. Recent guidelines from the national coordinating network of the NHS cervical screening programme recommended immediate referral for colposcopy for women with moderate dyskaryosis and repeat smear testing at six months for women with mild dyskaryosis, with referral for colposcopy if dyskaryosis persists.[7] The guidelines acknowledged that further evidence from prospective studies was required to endorse this policy. This prospective controlled study provides a framework within which to address this issue.

HIGH PREVALENCE OF CERVICAL INTRAEPITHELIAL NEOPLASIA GRADE III IN WOMEN WITH MILD OR MODERATE DYSKARYOSIS

Our study confirms the previously documented high prevalence of cervical intraepithelial neoplasia grade III in women with mild or moderate dyskaryosis. The 40% prevalence in our study is higher than other reports suggested.[11,18,19] The histological diagnosis in our study, however, was based on the higher grade of cervical intraepithelial neoplasia found on colposcopically directed biopsy or on large loop excision of the transformation zone; we found that large loop excision showed a much higher prevalence of cervical intraepithelial neoplasia grade III than did punch biopsy, on which most previous studies relied.[20] A significantly greater proportion of women with moderately dyskaryotic index smears had underlying cervical intraepithelial neoplasia grade III and subsequent severe dyskaryosis than women with mildly dyskaryotic index smears. Also, a significantly smaller proportion of moderately dyskaryotic smears reverted to normal. The prevalence of cervical intraepithelial neoplasia grade III was virtually the same in the women given immediate diagnosis and treatment and in those who were under surveillance for 24 months, which suggests that neither progression or regression of cervical intraepithelial neoplasia grade III occurred during the two years of surveillance. The increased proportion of women who were under surveillance for 24 months who had no cervical intraepithelial neoplasia shows that some regression of cervical intraepithelial neoplasia grades I and II occurred, but in only 12% of the women.

The importance of having a control group to provide representative histological findings at the start of the study is evident from these data; without a control group the high prevalence of cervical intraepithelial neoplasia grade III in the women who were under surveillance for 24 months might have been interpreted as evidence of progressive disease. We did not find any cases of invasive disease in the 88% of women who did not default: we cannot know, however, the eventual outcome in those who defaulted.

REGRESSION OF MILDLY ABNORMAL SMEARS TO NORMAL

This study did not confirm the suggestion that a considerable proportion of mildly abnormal smears revert to normal with time. Overall, only a quarter of women had a smear that reverted to normal on the first repeat smear test. Furthermore, about a fifth of women who had a biopsy immediately after a second non-dyskaryotic smear had cervical intraepithelial neoplasia grade III, although far fewer false negative results occurred with repeated normal smears.

DEFAULT

The other important issue in the evaluation of cytological surveillance is the rate of default. Studies have shown that the risk of subsequent invasive cancer among women who have a dyskaryotic smear is greatest among those who default.[13] The overall rate of default in our study was 12%, but rates of 25% have been reported[1]; indeed, this rate occurred in the women in our study who were under surveillance for 24 months.

POLICY OF REFERRAL FOR COLPOSCOPY NEEDED

The national coordinating network's guidelines state that women with a mildly dyskaryotic smear should have a repeat smear test after six months, with referral for colposcopy if dyskaryosis persists.[7] Of the women who were under surveillance for 24 months, 158 had a mildly dyskaryotic index smear; of these, 36 defaulted and 82 had a final smear showing dyskaryosis despite having normal smears at intervening checks. Thus only 40 women could be said to have benefited from surveillance, and even these women remained at increased risk of having a dyskaryotic smear in the future, which would necessitate referral for colposcopy. The small number of women with mild dyskaryosis who completed 24 months of surveillance in our protocol is central to the argument about the relative merits of the national coordinating network's policies. Because this minority cannot be identified prospectively, a surveillance policy is not in the best interests of the majority of women and would probably be more expensive than a policy of referral for colposcopy. According to our data, routine colposcopy would lead to 30% more referrals of women with mildly dyskaryotic smears but would avoid many additional smear tests and uncertainty for the women. A recent report, which used decision analysis to examine the management of mild cytological abnormalities, concluded that a policy of surveillance would probably not be cheaper than one of referral for colposcopy[21]; our large prospective study supports this.

Testing for human papillovirus with the polymerase chain reaction as an adjunct to cytology to improve the identification of women with high grade cervical intraepithelial neoplasia has been proposed.[19] In our study only 15% of the women who had a biopsy initially did not have cervical intraepithelial neoplasia and 70% had cervical intraepithelial neoplasia grade II or III. The need to retest women with abnormal cytological results to select those who need colposcopy depends on the threshold at which smears are regarded as being abnormal. This is well illustrated in the United States, where the Bethesda classification generates high proportions of abnormal smears that are reported as low grade squamous intraepithelial lesions (R Richart, meeting of the International Gynaecological Cancer Society, Stockholm, September 1993). Even if viral testing was used to select women for colposcopy, prospective evaluation on a large scale would be needed. If all women with a mildly abnormal smear were referred for colposcopy, colposcopic manage-

Clinical implications

- Mild and moderate dyskaryosis is evident in at least 3% of all cervical smears
- Debate continues as to whether cytological surveillance or referral for colposcopy is most appropriate for the management of women with mild or moderate dyskaryosis
- This study shows a high rate of cervical intraepithelial neoplasia grade III, a relatively high rate of default among women allocated to surveillance, and low rates of smears that become normal cytologically
- These findings indicate that referral for colposcopy is a more efficient strategy for managing women with mildly dyskaryotic smears than cytological surveillance

ment would need to be examined. It is important that women without cervical intraepithelial neoplasia and perhaps those with cervical intraepithelial neoplasia grade I, are not overtreated; a randomised trial is needed to address this issue.

In conclusion, this study shows that cytological surveillance is not an efficient strategy for managing women with mildly abnormal smears and that women with any grade of dyskaryosis should be referred for colposcopy.

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Prolonged breast feeding, diarrhoeal disease, and survival of children in Guinea-Bissau

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Abstract

***Objective*—To analyse the impact of breast feeding on diarrhoeal disease and survival in children above 1 year of age in Guinea-Bissau, west Africa.**

***Design*—A community study of an open cohort followed up weekly by interviews over 15 months. Data on feeding practices, anthropometry, and survival were recorded for three years.**

***Setting*—301 randomly selected houses in a semiurban area in the capital, Bissau.**

***Subjects*—849 children aged less than 3 years.**

***Main outcome measures*—Incidence and duration of diarrhoea, weight for age, and death of a child.**

***Results*—The incidence of diarrhoea was higher in weaned children than in partially breast fed children, both in 1 year olds (relative risk 1·41; 95% confidence interval 1·23 to 1·62) and in 2 year olds (1·67; 1·29 to 2·15). The mean duration of an episode of diarrhoea was 5·3 days in breast fed children compared with 6·3 days in weaned children (P= 0·001). Independent of the age of weaning, a similar increase was found in an analysis comparing, for each child, the rate and duration of diarrhoea one month before and one month after weaning. Children with low weight for age were breast fed longer than the better nourished children (P=0·02). Children aged 12-35 months who were not breast fed had a 3·5 times higher mortality (1·4 to 8·3) than breast fed children.**

***Conclusions*—The beneficial effects of breast feeding are not restricted to infancy. Though children who are partially breast fed after infancy may have a lower state of nutrition than the weaned ones, the benefit in terms of lower morbidity may be more important for child survival in places with a high morbidity from diarrhoea and with high mortality.**

Introduction

It was suggested early in this century[1] and later confirmed in several studies[2-7] that breast feeding was beneficial to the health of infants and that it had a protective effect against diarrhoea in infancy. The health impact of human milk in young children above 1 year of age, however, is controversial. In studies from Bangladesh breast feeding was associated with lower mortality up to the age of 3 years in malnourished children[6] and a lower prevalence and severity of bloody and chronic diarrhoea.[6 8] By contrast, several studies have associated prolonged breast feeding with reduced food intake and malnutrition.[9-12] Because of the association between low state of nutrition and prolonged breast feeding it has been suggested that breast feeding after 18 months of age may be detrimental.[11] Such views, however, disregard possible health benefits from prolonged breast feeding. Published data are insufficient to draw conclusions, and in particular little is known about the effect of prolonged breast feeding on child morbidity.

Prolonged breast feeding is common in Guinea-Bissau, where diarrhoea is a major cause of death in early childhood.[13] We analysed the impact of prolonged breast feeding on the incidence and duration of diarrhoea and on survival in children.

Subjects and methods

FIELDWORK

The community based study described in detail elsewhere[13 14] was conducted in a semiurban district, Bandim II, in the capital of Guinea-Bissau. An open cohort of 849 children born after 1 June 1984, residing in 301 randomly sampled houses, were included in the