WOMEN'S HEALTH

Challenges to cervical cancer screening in the Western Cape province

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Carcinoma of the cervix is the second most common cancer among South African women, with 1 in 41 women developing the disease in her lifetime.[1] Although population-based screening programmes using Pap smears can substantially decrease the incidence of the disease, such programmes remain remarkably difficult to implement. Lack of resources and available treatment, low community awareness, poor quality of Pap smears, and inadequate rates of follow-up are foremost among the documented obstacles to successful cytological screening.[2,3]

In South Africa, work to develop a nationwide screening programme has been ongoing, culminating in 1999 in the release of a national cervical screening policy.[4] The screening protocol is based on World Health Organisation (WHO) recommendations for regions with limited resources[5] and models of the natural history of the disease.[6] The incidence of invasive cancer in South Africa begins to rise for women between the ages of 35 and 39 years, with 87% of cases occurring in women over 35.[1] A lifetime total of three Pap smears, taken at 10-year intervals, is to be made available free to all women aged over 30 years, with follow-up and treatment for abnormal tests also free. The goal is to screen 70% of women in the target age group within 10 years of initiating the programme. Screening and treatment based on this model should theoretically decrease cancer incidence by 64%.[5]

It was in this context that the Cervical Health Implementation Programme (CHIP) was formulated. The aim of the project is to develop and evaluate health systems interventions for implementing cervical screening within primary care services in South Africa. It is hoped that the project will inform programme development both nationally and internationally. Specific objectives include development and implementation of health information systems, as well as education and training programmes for health care providers, and education programmes for community members. The three study pilot sites represent a range of service conditions in South Africa: Brakpan (Gauteng), Waterberg (Northern Province), and Mitchells Plain (Western Cape). Each site will participate in the three project phases, namely situation analysis, intervention, and monitoring and evaluation.

The Western Cape site is unusual in that in 1994 the provincial government replaced *ad hoc* screening at family planning clinics with a population-based screening policy almost identical to the present national policy. According to laboratory records, however, the number of Pap smears performed has decreased since the policy was introduced. In addition there has been no increase in the detection of pre-cancerous abnormalities. While there is widespread variability in access to health care in South Africa, urban areas of the Western Cape are well served. Therefore limited resources, the most pressing concern in many regions, is less pertinent here. Prior South African studies addressing barriers to screening from within the community have shown women to have limited knowledge regarding Pap smears and cervical cancer,[7] but little work has been done to identify barriers within the health services. We therefore targeted the first phase of the CHIP project to examine other factors at the level of health care provision that may impede effective screening.

This paper reports on the situation analysis undertaken in the Mitchells Plain health district in the Western Cape. We audited clinics to assess available resources, examined clinic records for cytology reports and follow-up information, and surveyed the attitudes, knowledge, and practices of nurses in the study district.

What was done

Mitchells Plain is a lower income district 25 km from Cape Town centre, with a population of 276 846 in 1998 (population figures based on the 1996 census data projected to 1998).[8] It has a well-developed public health infrastructure, with six local authority clinics, a community health centre, and a maternal obstetric unit.

One investigator (NS) visually inspected each primary care

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facility to assess equipment and examination rooms. All nurses who perform Pap smears were questioned concerning screening and follow-up practices.

Cytology laboratory records were used to determine the total number of Pap smears performed in 1998, and a review of clinic records provided detailed information from cytology reports. We examined the records of every second woman who had a cervical smear in 1998 at four of the seven district clinics, chosen for geographical diversity. Sixty-six records (26%) were missing or incomplete, resulting in a sample of 193.

One cytology laboratory examines all specimens, following national diagnostic standards, and using the Bethesda system for reporting of cervical cytological diagnoses. Laboratories recommend follow-up for all pre-cancerous lesions: immediate referral for colposcopy for high-grade squamous intra-epithelial lesions (HSIL), repeat Pap smear in 6 months for low-grade squamous intra-epithelial lesions (LSIL), and 6 or 12 months for atypical squamous cells of undetermined significance (ASCUS). No clear guidelines exist for inflammatory, infectious, and reactive lesions, which are grouped under 'benign cellular changes' (BCC). In these cases, cytologists often, but inconsistently, take the conservative approach of recommending a repeat test in either 6 or 12 months.

In order to assess adherence to follow-up recommendations, the records of the 70 women told to return for repeat Pap smear were examined in further detail. Mean time to repeat smear was calculated to ensure that all women had sufficient opportunity to follow up before being categorised as having not returned. A woman was defined as having adhered to recommendations if she returned for repeat smear within two standard deviations (SDs) of the mean time to return (i.e. within 17 months of the initial test in the cases of both 6-and 12-month recommendations). Chi-square analysis was used to determine whether follow-up rates differed from recommended time to repeat (6 v. 12 months), history of previous Pap smear (any v. none), smear result (LSIL/ASCUS, BCC, or no noted abnormalities), or age category (30 - 39 years, 40 - 49 years, etc.).

Fifty-one of 62 full-time nurses were interviewed individually using a quantitative survey. Informed consent was obtained from all participants, and confidentiality was assured. Replies were unprompted, open responses were recorded, and the same interviewer (NS) carried out all interviews during November and December 1999. Of the non-respondents, 7 were on leave, 1 declined, and 3 could not be interviewed during multiple visits to their health facilities. The survey was piloted at a Cape Town city clinic.

What was found

In order to achieve the targeted 70% population coverage under the current policy of infrequent screening, 3 466 screening Pap smears should be performed annually in the Mitchells Plain district (assuming 80% of the population attend the public health sector services). In 1998, a total of 1 463 smears were done at public sector services, with 545 of these performed on women in the target age range (30 - 59 years). This latter number represents only 16% of the expected number of screening Pap smears for that year.

The clinic audit determined that most Pap smears are performed at local authority clinics, with the wooden Aylesbury spatula used for cervical sampling. Registers of all smears performed are kept at each clinic, noting contact information, date, and result. Clinics are stocked with sufficient supplies to perform small numbers of the tests, although there are no posters or other media promoting cervical screening. Nurses perform virtually all smears, and send up to three letters to recall women requiring repeat test. There is no feedback to the nursing staff summarising the quality or results of screening performed at each site.

The review of cytology reports provided insight into the character of Pap smears performed. Test adequacy was often poor, with nearly half of reviewed samples lacking a sufficient component of endocervical cells (Table I). Half of all smears

Table I. Cytology results for Pap smears done at four area clinics in 1998 (193 records). Percentages are calculated from the total cases, although between one and three records were missing outcomes for each variable.

	N	*%*
Adequacy		
Satisfactory	108	56.0
Limited	84	43.5
Inadequate	0	0.0
Adequate endocervical component		
Present	102	52.9
Absent	88	45.6
Smear result		
BCC	99	51.3
ASCUS	13	6.7
LSIL	7	3.6
HSIL	2	1.0
No abnormalities	70	36.3
Recommendation		
Repeat in 6 months	23	11.9
Reason given by cytologist:		
ASCUS or LSIL*	19	
BCC	3	
No reason given	1	
Repeat in 12 months	47	24.4
Reason given by cytologist:		
ASCUS or LSIL*	10	
BCC	22	
No reason given	15	
Routine follow-up (10 years)	119	61.7
Refer for colposcopy	2	1.0

*Current or within the last 2 years.
BCC = benign cellular changes; ASCUS = atypical squamous cells of undetermined significance; LSIL and HSIL = low- and high-grade squamous intra-epithelial lesions.

Table II. Survey results of nurses' attitudes, knowledge and practices concerning cervical cancer screening and the South African national screening policy (*N* = 51 nurses)

Survey questions and responses given by at least two nurses	*N*	%
Knowledge and attitudes regarding the screening policy of three smears, 10 years apart, starting at age 30		
Familiarity with the cervical screening policy		
Aware that a policy exists	46	90.2
Able to correctly state the policy	29	56.9
After being informed of the guidelines of the policy		
Agree with the policy	7	13.7
Disagree with the policy	43	84.3
Explanation for disagreeing		
Cancer may develop during the 10-year interval	39	90.7
Screening should begin with sexual activity	3	7.0
At what age nurses believe smears should begin		
With sexual activity	26	51.0
Before age 30	13	25.5
At 30	3	5.9
Over 30	6	11.8
How frequently nurses believe smears should be repeated		
Every year	10	19.6
Every 3 - 5 years	37	72.5
Attitudes, knowledge, and practices regarding cervical screening services		
Nurses' general attitudes toward screening		
Believe that more smears can be done at their health facility	44	86.3
Believe that sharing information will encourage women to have smears	51	100.0
Believe that they are too busy to share the necessary information with women	21	43.1
Knowledge regarding why smears are performed		
To prevent cancer	45	88.2
Do not know	2	3.9
Criteria given by nurses for performing a smear (multiple responses accepted)		
Appropriate (age, time since last smear, signs, symptoms, past abnormal smear)	51	100.0
Inappropriate (lifestyle, family history)	11	21.6
Of nurses who have performed a smear in the last 3 months (*N* = 28)		
Ability to interpret cytology results (multiple responses accepted)		
Understand all results	10	35.7
Understand no results	7	25.0
Would like more training in interpretation of results	23	82.1
Have ever been prevented from performing a smear due to unavailable equipment		
Yes	2	7.1

had evidence of benign cellular changes (inflammatory, infectious or reactive), and 36% of these were recommended for repeat Pap smear at 6 or 12 months.

Overall, the rate of adherence to recommendations for follow-up was 71%. Ninety-one per cent of women (21 of 23) recommended to repeat at 6 months did so, significantly more than the 61% (29 of 47) told to repeat at 12 months ($\chi^2 = 6.7$, $p = 0.01$). To address why rates of adherence may have been lower in the 12-month group, history of previous Pap smear, Pap smear result, and age were examined. Women with a history of any prior Pap smear were significantly more likely to return ($\chi^2 = 7.3$, $p = 0.007$), although adherence to recommendations did not differ with Pap smear result ($\chi^2 = 0.54$, $p = 0.91$), or age category ($\chi^2 = 2.29$, $p = 0.13$).

Of the interviewed nurses, 90% were aware that some screening policy exists, and 57% could correctly state the policy (Table II). Most were opposed to the 10-year policy on the basis that they believed cancer could develop during the screening interval. They felt that screening should occur every 3 - 5 years, either starting with sexual activity, or before age 30. Eighty-six per cent believed that more smears could be done at their health facility, but many felt they were too busy to share information which would encourage women to have the test. Although most understood why Pap smears are performed, and all gave some appropriate criteria for performing them, 22% additionally gave inappropriate criteria. All nurses relied completely on the recommendations provided in cytology reports in making clinical decisions concerning follow-up.

Discussion

We evaluated a Western Cape cervical cancer screening programme 6 years after the introduction of a provincial, population-based, 10-year interval screening policy. The low

population coverage observed in our study area is probably a result of many interrelated factors. We will restrict our discussion to barriers which can be identified from the results of the present study at the level of the health services themselves.

The low population coverage rate is particularly alarming in light of the low Pap smear adequacy. Limited adequacy was almost solely due to poor sampling, as has been demonstrated in previous studies.[2,3] Although clinics do not have access to endocervical brushes, Aylesbury spatulas should be sufficient to obtain an adequate endocervical cell count if used properly.[9] The problem therefore appears to rest primarily in the training of nurses performing smears, which can easily be addressed through education in sampling technique. Related concerns are that a sufficient number of endocervical cells is a known surrogate for the ability to identify cervical lesions,[9] but not a criterion for repeat test, nor are nurses provided with any feedback on the quality of the smears they perform.

While the problem of low Pap smear adequacy has been reported in other regions of the world, the present study also highlights two previously undocumented barriers to screening programme success. First, high rates of BCC contributed to large numbers of repeat tests — an approach incompatible with the infrequent screening proposed for areas with limited resources. Such changes accounted for one-half of all smears, and one-third of smears considered to necessitate repeat testing. It is unclear whether these mild abnormalities are in fact precursors to cancer,[10,11] and so conservative management (i.e. repeat test) is frequently advocated in resource-rich areas. This precautionary approach is likely to be inappropriate in less advantaged regions with finite resources, where the prevalence of these lesions can reach 80%.[11] The policy of infrequent screening advocated by the WHO and others[5,6] is not designed to accommodate repeat testing for one-third of all women screened. It can be extrapolated that as population coverage increases, the costs associated with such an approach will rapidly test the limits of available resources. Appropriate guidelines for Pap smear findings of BCC and inadequate endocervical cells must be developed if infrequent, population-based screening is to succeed.

Second, nurses were opposed to and misunderstood the screening policy, probably limiting the performance of screening. This study clearly demonstrates that the rationale behind the 10-year interval screening policy is not adequately understood by the nurses whose role it is to carry out the programme. It is reasonable to speculate that the low population coverage rates identified here may be causally linked, at least in part, to the negative attitude nurses have toward the screening policy, as well as to their lack of familiarity with the natural history of cervical cancer. Education concerning the rationale of the policy, and the natural history of the disease, may encourage nurses to perform more tests, as they appear to be supportive of screening in general.

Despite the limitations of the current screening programme, there is cause for optimism in the high rates of follow-up achieved by nurses. Follow-up rates (91% for 6-month return, 71% overall) seen here rival, and in some cases exceed, those reported in resource-rich programmes.[12] Women were significantly more likely to return as instructed in 6 rather than 12 months, possibly as a result of a greater sense of urgency associated with a 6-month recommendation. Significantly more women returned in 12 months if they had had a previous Pap smear, confirming prior studies of attendance.[13]

We have identified multiple barriers from within the health services which impede cervical cancer screening programme success. The present study does suggest, however, that many of these challenges may be surmounted through the education and training of clinic staff, and through carefully planned health systems interventions.

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