

The impact of the introduction of a colposcopy service in a rural sub-district on the uptake of colposcopy.

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Abstract

Objectives: To describe the establishment of a colposcopy service in a district hospital in a rural sub-district and to assess its impact on the uptake of colposcopy.

Design: A retrospective double group cohort study using a laboratory database of cervical cytology results, clinical records and colposcopy clinic registers.

Setting: The Overstrand sub-district in the Western Cape: 80 000 people served by 7 clinics and a district hospital in Hermanus, 120 km from its referral hospitals in Cape Town and Worcester. A colposcopy service was established at Hermanus Hospital in 2008.

Subjects: All women in the Overstrand sub-district who required colposcopy on the basis of cervical smears done in 2007 and 2009.

Outcome measures: The number of women booked for colposcopy at distant referral hospitals in 2007 and at the district hospital in 2009, the proportion of those women who attended colposcopy, the time from cervical smear to colposcopy, comparison between the two years.

Results: The uptake of colposcopy booked for distant referral hospitals was 67% in 2007. The uptake improved by 18% to 79% for the local district hospital colposcopy service in 2009 ($p=0.06$). When analysed excluding patients from an area with no transport to the district hospital, the improvement was more marked at 22% ($p=0.02$). The delay from cervical smear to colposcopy improved significantly from 170 to 141 days ($p=0.02$).

Conclusion: The establishment of a colposcopy service in a rural sub-district increased the uptake of colposcopy and decreased the delay from cervical smear to colposcopy. This district hospital colposcopy service removed 202 booked patients in one year from the colposcopy load of its referral hospitals.

Introduction

Cervical cancer is a major cause of morbidity and mortality amongst women worldwide and the most common cancer affecting women in South Africa¹. It accounted for 2% of premature deaths amongst women over the age of 15 years in the Boland Overberg region in South Africa in 2005². The South African national cervical cancer screening policy is based on the use of cervical cytology. It recommends Papanicolaou (pap) smears for all women at 10 year intervals from the ages of 30 to 60³. There is a strong association between HIV and cervical cancer. A meta-analysis of 21 studies showed that an HIV positive woman has a 4.9 times higher risk of developing cervical cancer than an HIV negative woman (95% CI 3,0 – 8,2)⁴. The Western Cape Province recommends that HIV positive women have 3-yearly cervical smears from the age of 20³.

Precancerous cervical changes can be classified broadly as low-grade squamous intra-epithelial lesions (LSIL) and high grade squamous intra-epithelial lesions (HSIL). Low grade lesions are followed up by a repeat cervical smear after 1 year (6 months if HIV positive). Patients with repeated LSIL and all with HSIL are to be referred for colposcopic examination of the cervix so that the diagnosis can be confirmed histologically and the lesion treated. These patients are then followed up with more frequent cervical smears. Because of weaknesses in the prevention and screening process, which includes education and awareness, there remains a high rate of cervical cancer in spite of the technological means to prevent it^{5,6,7}.

The participation of women in the full cervical screening process has been assessed in several studies, mostly in developed settings^{5,6,7,8}. One area of breakdown in the process is failure to access colposcopy services. As colposcopy is a specialised service it is usually provided at referral hospitals, which may be very far from where patients live. Transport problems feature among a number of factors linked to the often poor uptake rates of colposcopy worldwide. In a study in Italy 81% of women accessed colposcopy services after referral, while women from low socio-economic groups in the UK and USA attended their colposcopy appointments at a rate of 50-75%^{5,7}. A study in rural Australia showed a 69% colposcopy uptake rate, with rural and indigenous women, those living transiently in an area and those in very remote areas being less likely to attend follow-up⁹.

Alternatives to specialist colposcopy services at referral centres are telecolposcopy, portable colposcopy, nurse practitioner or generalist colposcopists, and the establishment of colposcopy services in local primary health care facilities or district hospitals^{7,8,10,11,12}. Local colposcopy

services outside of referral centres were found to be cost-effective, more acceptable to patients and resulted in higher rates of attendance for colposcopy^{7,8,11}.

A number of interventions can have a greater impact on adherence to the “care plan” than the provision of a local colposcopy service. Improved communication was consistently associated with better adherence, most importantly ensuring that the patient understood the reason for the cervical smear, the necessity of returning for results, the meaning of their results and the purpose of colposcopy^{5,6}. Individualised reminders of follow-up appointments (e.g. telephone call) improved attendance^{5,6}. While interventions aimed at improving patient understanding and remembering appointments appear to be most effective, there remains a need for more concrete improvements to the screening system.

No studies were found examining attendance rates at South African colposcopy clinics and the follow-up of women with abnormal smears. A Cape Town study in 2010 predicted that the increase in cervical screening and the number of lesions requiring follow-up was likely to outpace the growth of colposcopy services in South Africa¹. For this reason alone, an investigation into establishing colposcopy services outside of the existing referral centres would be justified.

Context

The Overstrand sub-district is situated in the Overberg district of the Western Cape Province, South Africa. The population of approximately 80 000 people receives primary health care from 7 clinics¹³. The district hospital is situated in the town of Hermanus which is 120 km from both its secondary (Worcester) and tertiary (Tygerberg) referral hospitals, where the Overstrand's colposcopies were done. The medical staff at Hermanus Hospital is made up of generalist doctors. In August 2008 a local gynaecologist was asked to set up a colposcopy service at Hermanus Hospital to lessen the problems of transport for referred patients and to relieve the pressure on the distant colposcopy sites in the hope of improving the follow-up of these patients.

Aim

The aim of this study was to determine whether the establishment of a district hospital colposcopy service within the Overstrand sub-district has improved the uptake of colposcopy amongst women who require it, as compared with referring them for colposcopy at a distant secondary or tertiary hospital.

Methods

Study design and subjects

A retrospective double group cohort study was conducted. The cohort was women in the Overstrand who were booked for colposcopy on the basis of their cervical smear result. Only women who received care in government health services were included. The first group was all women booked for colposcopy at distant referral sites in 2007 (Tygerberg and Worcester Hospitals), before the introduction of a local colposcopy service. The second group was all women booked for colposcopy in 2009, after a colposcopy service had been established in Hermanus. Data was not collected from 2008 as for a time all three sites were used.

The following cervical cytology results were regarded as indications for colposcopy:

- HSIL
- atypical squamous cells of undetermined significance (ASCUS)/ LSIL/ human papilloma virus (HPV) changes on repeat cervical smear done for these changes after 1 year (or 6 months if HIV positive)
- atypical glandular cells of undetermined significance (AGUS)
- adenocarcinoma-in-situ (AIS)
- suspected cervical carcinoma (Ca)

Data collection

All cervical cytology results from the Overstrand for 2007 and 2009 were obtained electronically from the National Health Laboratory Services (NHLS) cytology laboratory at Tygerberg Hospital. From this spreadsheet of abbreviated results, details of all patients with ASCUS, HPV, LSIL, HSIL, AGUS and Ca were extracted. For results where immediate referral for colposcopy was not

automatically indicated, i.e. LSIL, ASCUS, HPV, where it would have been appropriate in most cases to repeat the smear after 6-12 months, the full cytology report was drawn from WWDISA, the secured internet results portal of the NHLS. The laboratory recommendation, which is included with each report, was checked to see what message had been given to the professional nurse about the need for colposcopy referral in each case. This was because it was not possible to tell from a spreadsheet of results whether or not the abnormality reported was new or persistent.

The medical records were reviewed of all patients who had HSIL, AGUS or Ca and of those patients with LSIL/ASCUS/HPV where colposcopy was recommended on the cytology report.

The medical records were checked to find the HIV status of each patient, whether she had returned, had received the result and whether colposcopy had been booked. The colposcopy site and appointment date were recorded. Evidence of her having received colposcopy was sought in the patient's records and whether or not she had remained in care.

The colposcopy registers at Worcester, Tygerberg and Hermanus Hospitals were reviewed to find if patients had attended their colposcopy appointments. Patients were assessed as having attended colposcopy if they attended at some point even after several missed appointments. The number of patients requiring rebooking before attendance was not recorded.

Statistical analysis

Microsoft Excel 2000 was used to capture the data and patient names were removed before analysis. Statistical analysis was done using Statistica version 9 (StatSoft Inc. www.statsoft.com). The Mann Whitney U test was used to compare non-parametric variables, categorical variables were compared using the Chi square test. A p-value of $p < 0.05$ will represent statistical significance in hypothesis testing.

Ethical considerations

Ethical approval was obtained from the Health Research Ethics Committee of the University of Stellenbosch, ethics reference number N09/11/334. A list of colposcopy non-attenders was compiled for each clinic in order to trace and invite them to return for colposcopy.

Results

Description of the start-up of a district hospital colposcopy service:

After encountering problems with transport for colposcopy bookings from the Overstrand sub-district a retired gynaecologist in Hermanus was approached to start a colposcopy service at Hermanus Hospital on a sessional contract. Colposcopies were initially booked fortnightly from August 2008. After a year the service was taken over by a gynaecologist in private practice who was appointed on a sessional basis to do weekly colposcopies. A discarded colposcope from Tygerberg Hospital was used. Because of difficulty in finding replacement bulbs, it was later replaced by a new basic colposcope costing R60 000. Colposcopies were performed in the operating theatre. The existing diathermy machine was used with LLETZ (large loop excision of the transformation zone) loops that were bought. Standard Cusco's specula were used with a suction catheter attached to wall suction held or wedged into the side; this was later replaced by specialised smoke-extraction specula. The histology costs for analysis of the LLETZ specimens was more than anticipated at approximately R1000 per patient. Each patient was given a follow-up appointment to see the gynaecologist a month later for histology results. Follow-ups were seen each week in the out-patients department after the colposcopy list. Forms were designed to send to referring clinics with colposcopy findings and follow-up instructions.

The primary health care head count for the Overstrand health care facilities was 214941 patients in 2007 and 300216 in 2009, an increase in patient numbers of 40%. A total of 886 cervical smears were done in the Overstrand in 2007 and 1628 in 2009, an 84% increase over 2 years. Table 1 shows the breakdown of results.

Table 1: Total cervical smears done in 2007 and 2009 with a breakdown of results.

cervical cytology results	2007	(%)		2009	(%)
unsuitable	10	1.1		29	1.8
normal	654	73.8		1096	67.3
benign changes	48	5.4		85	5.2
atypia	7	0.8		32	2
ASCUS	30	3.4		30	1.8
ASC-H	1	0.1		5	0.3
AGUS	1	0.1		3	0.2
LSIL	93	10.5		221	13.6
HSIL	36	4.1		125	7.7
malignant	6	0.7		2	0.1
TOTAL	886			1628	

The median age at time of cervical smear was 34 years in 2007 and 33 years in 2009. Of all the cervical smears, 32% were done on women under the age of 30 and 3.6% were done on women over the age of 60.

The files of patients with cytology reports recommending colposcopy were requested: 109 from 2007 and 310 from 2009. The proportion of these patients who received communication of their cytology results is shown in table 2.

Table 2: Patients where colposcopy was recommended on the cytology report did not all receive communication of their results.

	2007	(%)	2009	(%)
cytology report recommended colposcopy	109		310	
result communicated to patient	77	70.5%	254	82.0%
result not communicated to patient	18	16.5%	43	14.0%
not known if result communicated to patient	14	13.0%	13	4.0%

The HIV prevalence amongst those booked for colposcopy was 88.3% in 2007 (1.6% unknown) and 86.% in 2009 (4% unknown).

In 2007 60 patients were booked for colposcopy at Tygerberg and Worcester Hospitals. This represents 6.8% of the women who had cervical smears in that year. In 2009 202 patients were booked for colposcopy, all at Hermanus Hospital. This represents 12.4% of the women who had cervical smears in that year.

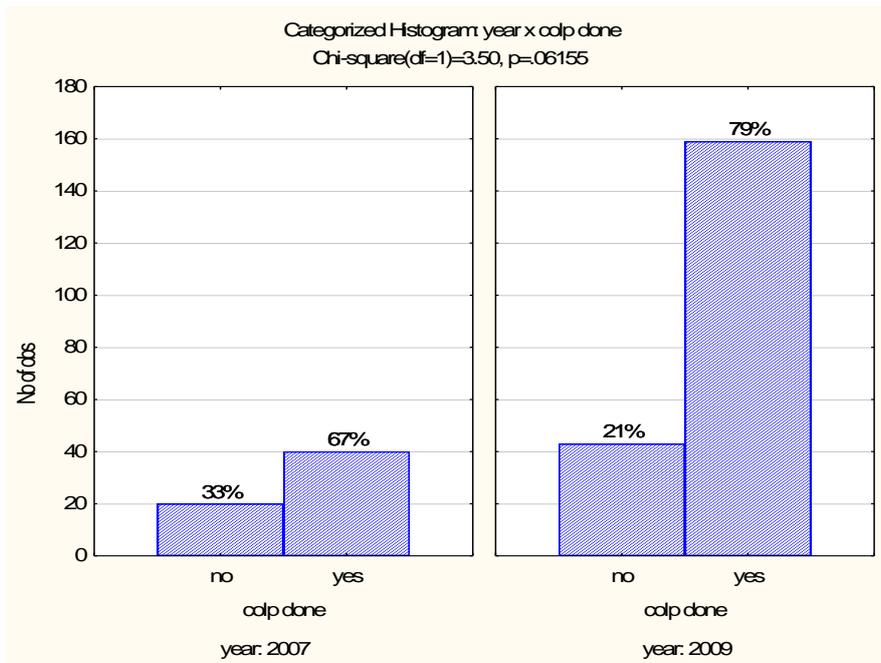
The breakdown of cervical lesions on cytology of patients booked for colposcopy is shown in table 3.

Table 3: The breakdown by cervical cytology of patients booked for colposcopy.

Total booked for colp	2007	%	2009	%
ASCUS	0	0.0%	2	1.0%
ASC-H	0	0.0%	2	1.0%
AGUS	0	0.0%	1	0.5%
LSIL	33	55.0%	94	47.0%
HSIL	22	37.0%	102	50.0%
Ca	5	8.0%	1	0.5%
TOTAL	60		202	

In 2007 40 of the 60 patients booked (67%) attended colposcopy at Tygerberg and Worcester Hospitals. In 2009 159 (79%) of the 202 patients booked attended colposcopy at Hermanus Hospital (figure 1). This is an improvement in colposcopy uptake of 18% from 2007 to 2009, a positive trend in colposcopy uptake (p=0.06).

Figure 1: Uptake of colposcopy for 2007 and 2009.



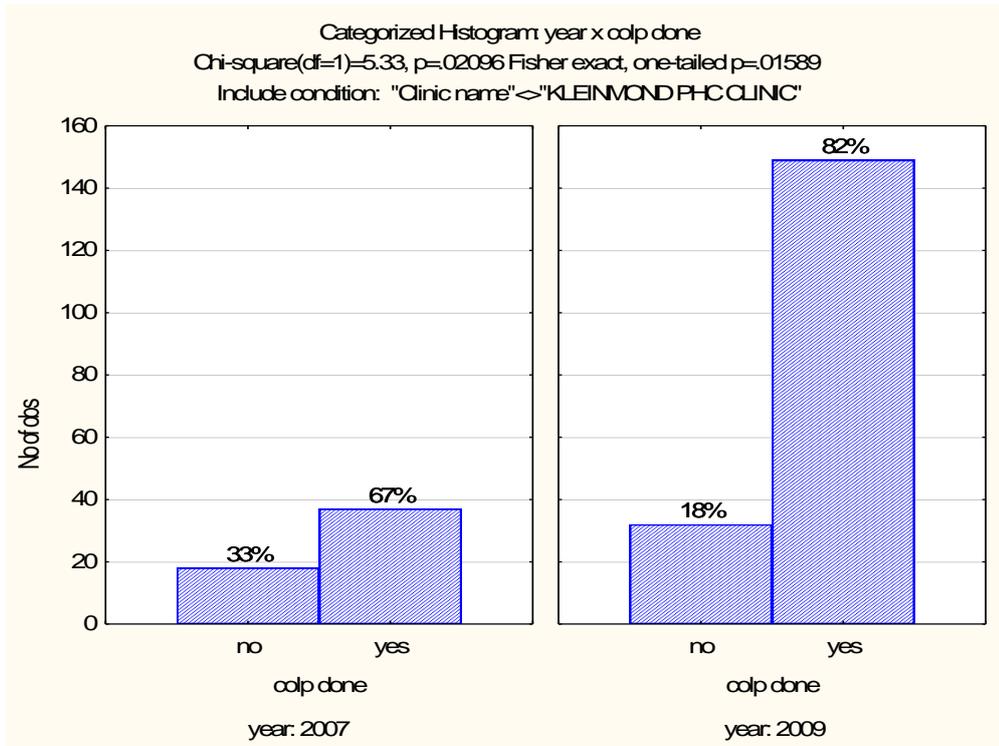
The colposcopy uptake per clinic, with distances from the district hospital and the availability of public transport from each area is demonstrated in table 4.

Table 4: Colposcopy uptake per clinic, with distances from the district hospital and the availability of public transport from that area.

Clinic	Distance from Hermanus Hospital	public transport available	colp done 2007	colp not done 2007	colp uptake 2007	colp done 2009	colp not done 2009	colp uptake 2009
Hospital OPD	0km	yes	16	8	67%	67	9	88%
Hermanus	1.3km	yes	0	0		5	1	83%
Zwelihle	2.4km	yes	13	4	76%	50	11	82%
Mount Pleasant	2.4km	yes	0	0		7	2	78%
Hawston	11km	yes	3	1	75%	6	2	75%
Stanford	28km	yes	3	2	60%	4	0	100%
Kleinmond	36km	no	3	2	60%	10	11	48%
Gansbaai	50km	yes	2	3	40%	10	7	59%

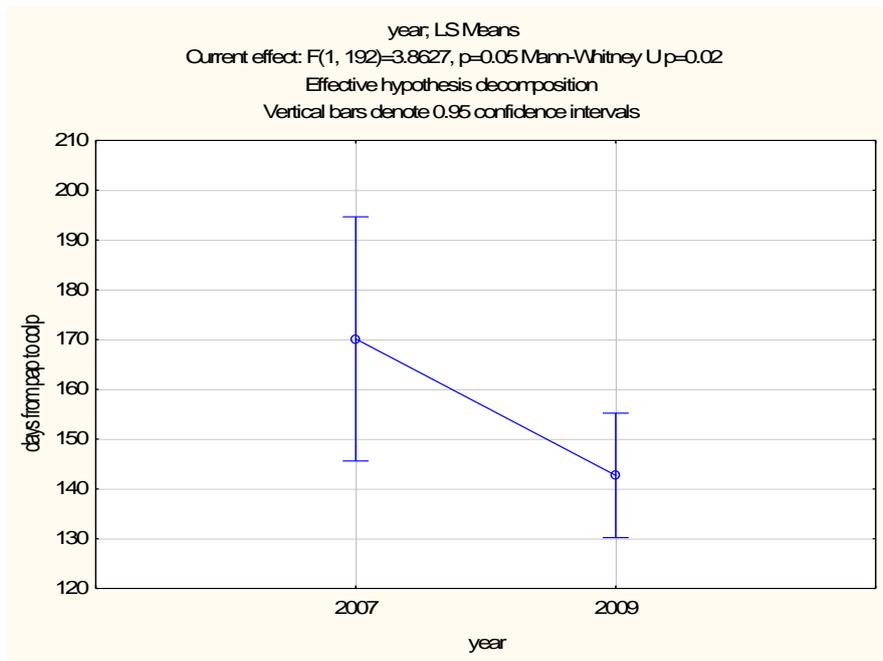
If the colposcopy uptake is analysed excluding the patients from Kleinmond where there is no transport to Hermanus Hospital, there is a significant 22% increase in uptake from 2007 to 2009 ($p=0.02$) (figure 2).

Figure 2: Colposcopy uptake for 2007 and 2009, Kleinmond patients excluded.



The mean time from the date of taking the cervical smear to the date of attending the colposcopy clinic was 170 days in 2007 and 141 days in 2009, i.e. there was a significant reduction of 29 days (17%) p=0.02 (see figure 3).

Figure 3: Days from cervical smear to colposcopy in 2007 and 2009.



The median age of women booked for colposcopy in both groups was 30 years in 2007 and 31 years in 2009.

For those women who did not attend their colposcopy appointment in 2007, 7 (35%) were lost to follow up from their clinic and 13 (65%) remained in care at their clinic after the missed appointment. In 2009 14 (33%) were lost to follow-up and 29 (67%) remained in care.

In 2007 there were 14 patients with HSIL who were not booked for colposcopy. Of these, 4 were lost to follow-up, 1 was known to have died, 4 files were missing and for 5 patients the cervical smear results were either not obtained or not noted by the hospital or clinic.

In 2009 there were 22 patients with HSIL and one patient with Ca who were not booked for colposcopy. Of these, 15 were lost to follow-up, 3 were known to have died (including the patient with Ca), 1 file was missing and for 4 patients the cervical smear results were either not obtained or not noted (table 5).

Table 5: Reasons for HSIL and cancer patients not booked for colposcopy.

	2007	(%)	2009	(%)
HSIL not booked for colposcopy	14		22	
Ca not booked for colposcopy	0		1	
lost to follow up	4	29%	15	65%
known to have died	1	7%	3	13%
can't find file	4	29%	1	4%
results not noted by clinic	5	35%	4	17%

Discussion and Recommendations

The primary health care patient load in the hospital and clinics increased considerably (40%) from 2007 to 2009. That notwithstanding, 84% more cervical smears were done in 2009. This increase could be attributed to the provincialisation of the clinics that occurred in July 2007. Municipal clinics were taken over by the Department of Health and incorporated into a unified district health system together with the district hospital. This strengthened primary health care and brought the clinics on board to aim for cervical smear targets.

The national cervical smear performance targets only take into consideration cervical smears done 10-yearly on patients between the ages of 30 and 60. Using this measure at least 32% of the cervical

smear work load in this sub-district, which was done on HIV positive women under the age of 30, would not have been recognised when measuring the performance of the PHC services.

The overwhelming majority of women booked for colposcopy were HIV positive. The cervical cytology performance targets should be adapted to take the HIV guidelines into account and to be relevant to the workload and the burden of disease. The overwhelming preponderance of HIV positive women booked for colposcopy suggests that the 10 yearly interval screening of asymptomatic women is being neglected in favour of screening of the HIV-infected population. Plans for increasing the 10 yearly screening of cervical smears, outside of the context of HIV care, need to be put in place.

Fourteen percent of women who had cervical smears were not told their results; this was most commonly because they were not seen again in their clinics. However some patients were seen again but the results were not noted by the health care workers, the results being either not in the file or in the file, but overlooked. Cervical cytology is of no value if the result is not noted and acted upon. It is recommended that every woman should be given a written appointment in order to receive her results irrespective of whether these are normal or abnormal. Improvement in the follow-up of women is likely to occur if the cervical cytology targets are changed to measure the number of cytology results given to women rather than the number of cervical smears taken.

The numbers of women booked for colposcopy increased considerably from 60 in 2007 when they were booked for distant referral hospitals to 202 in 2009 when they were booked for the local district hospital, an increase of 236%. This increase was much greater than the 84% increase in cervical smears done. This is not explained by the increase in abnormal smears (table 1). A possible explanation can be that the establishment of the local colposcopy service increased awareness of colposcopy. Doing away with the need to book transport would have simplified the colposcopy booking process and this may have encouraged professional nurses to book colposcopy more readily. There is no evidence of an increase in unnecessary colposcopies booked, as the proportion of LSIL colposcopies booked (which can include some unnecessary bookings) did not increase in 2009 (table 3).

The 202 colposcopies booked in 2009 for Hermanus Hospital removed 202 women from the waiting lists of the referral hospital colposcopy clinics where resource constraints limit the capacity for further increase. The benefit of using private doctors to provide services to state patients is demonstrated here. The wealth of expertise outside the government service can be used to the

advantage of state patients if managers are given the scope to implement creative solutions to problems. If a similar service is to be established in another area, expertise could be provided by referral hospital specialists on an outreach basis or by the training of an interested family physician, career medical officer or a specialist nurse.

A greater proportion of women attended their colposcopy appointments when they were booked for the colposcopy service within their sub-district than when they were booked for colposcopy at a distant referral hospital ($p=0.06$). In other words, the establishment of a district hospital colposcopy service did improve the uptake of colposcopy in a rural sub-district. The improvement in uptake was most marked in the clinics closest to the hospital. For the only area without public transport, Kleinmond (36km from the district hospital), there was a worsening of colposcopy uptake in 2009. This is because, although often fully booked, the government-provided planned patient transport is the only transport available to those without private transport in Kleinmond. This meant that if a patient was fortunate enough to get a place on the “ambulance bus”, it was easier for her to travel 120km to Tygerberg Hospital than to hitch-hike the 36km to Hermanus Hospital. When Kleinmond clinic was excluded from the analysis the statistical significance of the increase in colposcopy uptake improved, with the p value decreasing to 0.02. This highlights the importance of transport in the accessibility of medical services. Transport arrangements need to be put in place in order to assist the patients from less accessible areas to get the care that they need.

The time from cervical smear to colposcopy seems inordinately long; the 17% decrease from 170 days (five and a half months) to 141 days (four and a half months) was nonetheless a statistically significant improvement afforded by the local service. Reasons for delay included a delay in the patient returning for results, a delay in the result being noted and acted on by the healthcare worker and patients missing their colposcopy appointments and being rebooked for a later date. The improvement could be partly explained by the local service doing away with the difficulty of coordinating open seats on the planned patient transport service with available colposcopy appointments at the distant sites. As the local colposcopy service gained momentum the backlog of women needing colposcopy was worked away and the waiting list greatly reduced by 2010. At the timing of writing this paper (August 2010) the waiting list for colposcopy was at Hermanus Hospital 34 days, at Worcester Hospital 83 days and at Tygerberg Hospital 146 days with the possibility of accommodating urgent patients earlier. This improved access to colposcopy is reason enough to consider starting up more colposcopy sites at district hospitals where the circumstances allow.

Not all women who failed to attend colposcopy were lost to follow-up. In 2007 35% and in 2009 33% of women who missed their colposcopy appointments continued in care at their clinics. A proportion of these women had missed multiple colposcopy appointments. These women who remained in care are women who could potentially be assisted or persuaded to present themselves for colposcopy. If colposcopy clinics record the name of the clinic making the booking alongside the details of the patient booked, they can send a notification to each clinic that their patients did not attend. Persuading someone to attend her appointment is more likely to succeed if the service is local; the more inaccessible a service is, the more likely it is to have a high rate of defaulting. This is further support for the idea of decentralising colposcopy services.

Of concern were those with HSIL or suspected cancer on cytology who were not booked for colposcopy: 14 HSIL patients in 2007 and 23 in 2009 (1 patient with cancer). Most of these patients were either lost to follow-up or known to have died. But 5 patients (36%) in 2007 and 4 patients (17%) in 2009 were still in care with cytology results that had either never been actively sought by the staff, or were in the file but not acted upon. Better systems need to be put into place to prevent such errors, which can lead to unnecessary morbidity and mortality and are a medico legal hazard. Possible solutions are a sticker or marker on the front page of the notes or the inside cover of the folder that is only crossed off when the result is obtained and receives the action required. The same system could be used to remind the staff of repeat pap smears that are required and will be forgotten if not marked somewhere prominent in the patient's file. Good communication and patient education will remain an important key to the cervical screening process, as a well-informed patient can help to remind her carer of the follow-up that is required.

The study highlighted the areas needed to strengthen the cervical cancer prevention program at many levels: getting the results to patients, taking the correct action on results and facilitating the attendance of colposcopy and further follow-up. Simple administrative improvements can be expected to impact positively on the screening process.

Limitations and suggestions for further study

The two years compared had differences besides the change in the referral pathway for colposcopy. The workload increased considerably from 2007 to 2009 as did the management structure with the provincialisation of the clinics. The district hospital colposcopy service started in August 2008 and

gradually increased in capacity over time. If the colposcopy uptake or time from cervical smear to colposcopy were to be measured again in 2010 a further improvement could be expected.

Patients were assessed as having attended colposcopy if they attended at any time on the grounds of their cervical smear. The number of missed colposcopy appointments was not recorded, only whether or not the patient eventually had colposcopy for that abnormal smear. This study did not follow the cervical cancer screening process further to assess the return for histology results or repeat colposcopy and follow-up pap smears. The retrospective design of the study prevented assessment of convenience and acceptability for both patients and staff.

An analysis of the cost to the state and the patient of the local versus the distant colposcopy service would further inform decision-making about the establishment of colposcopy services in district hospitals.

Conclusion

This study demonstrates that the establishment of a colposcopy service at a district hospital in a rural sub-district in South Africa is possible, and that it increased the uptake of colposcopy and decreased the delay from cervical smear to colposcopy. This district hospital colposcopy service for one rural sub-district removed 202 patients booked in one year from the colposcopy load of its referral hospitals. The colposcopy service was relatively easy to set up and except for the cost of the colposcope, did not demand significant capital outlay. An environment conducive to enabling creative solutions allowed the use of private gynaecologists for the necessary expertise. As the demand for colposcopy increases, the establishment of other district hospital colposcopy services would help to improve access for many rural women requiring this essential service.

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