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CLINICAL ARTICLE

Patient compliance with cervical smear surveillance in a shared-care setting

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ABSTRACT

Objective: To examine patient compliance with cervical smear surveillance at a primary care center. *Methods:* A retrospective study included data from patients referred from a tertiary center, to a University of Hong Kong primary care center following colposcopy for continuing cervical smear surveillance between January 1, 2005 and December 31, 2006. Patient records were reviewed and details of the initial screening or treatment that led to referral and the three subsequent follow-up screenings were examined. A multivariate analysis was performed to identify factors that were associated with increased odds of patients not attending follow-up screening. *Results:* In total, records from 833 patients were included. Of these patients, 348 (41.8%) failed to attend at least one screening, with 172 (49.4%) of this group attending after being reminded. The compliance rate prior to patients being reminded of screening follow-up decreased across the three follow-up screenings, with 706 (84.8%) patients attending their first follow-up visit and 561 (67.3%) patients attending the third. In the multivariate analysis, being younger than 50 years old, having a history of smoking, and not having undergone medical treatment related to cervical cancer screening previously were associated with increased odds of not attending follow-up screening (all $P < 0.05$). *Conclusion:* Patients at increased risk of non-compliance with screening follow-up should receive particular attention and counselling regarding screening.

1. Introduction

In many high-income countries, the incidence of cervical cancer has been decreasing; in the United Kingdom, the European age-standardized incidence of cervical cancer decreased by 49% between 1985 and 2005, and cervical-cancer mortality has decreased by 71% since the 1970s [1]. It has been estimated that cervical smear screening could have resulted in a 60%–80% reduction in the number of deaths due to cervical cancer in the UK since existing screening practices were established [2,3]. The effectiveness of such screening programs relies not only on the performance of smear sampling, specimen processing, and data interpretation, but also on the organization of the program, population coverage, and the availability of colposcopy and treatment when required. Appropriate follow-up after colposcopy has also been demonstrated to be very important. Reports from New Zealand [4] and the UK [5] have demonstrated that approximately half of patients diagnosed with cervical cancer did not undergo cervical smear screening during the previous 3 years. Among patients who undergo treatment for cervical intraepithelial neoplasia (CIN), the risk of invasive disease remains approximately three-times higher in comparison with the general population for at least 20 years, whereas the risk of post-treatment CIN declines over the 10 years following treatment [6]. This paradoxical phenomenon could be explained by patient non-compliance with follow-up after CIN treatment, resulting in decreased CIN screening and a resulting increased risk of cervical cancer.

In Hong Kong, cervical smear screening is often performed by general practitioners and nurses, while colposcopy and CIN treatment normally occurs in colposcopy clinics in tertiary hospitals. This system, termed "shared care", has the potential to reduce tertiary hospital workloads and alleviate patient anxiety. A study in the UK [7] demonstrated that there was no difference in residual-disease detection rates between primary- and tertiary-care settings; additionally, 76% of patients in this study reported preferring to attend follow-up screening at primary care facilities.

However, despite the apparent efficacy of shared care systems, a survey conducted by the Hong Kong Department of Health found that only 56.6% of women aged 25–64 years had undergone a cervical smear within the previous 3 years [8]. There is a lack of understanding regarding patient compliance patterns in the primary-care setting. Potentially, the shared care system could give rise to false reassurance among patients, lowering patient awareness of health problems and leading to non-compliance with appropriate primary-care follow-up. The aim of the present study was to examine the compliance patterns of primary-care follow-up among patients after undergoing colposcopy and/or treatment at a tertiary hospital.

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2. Materials and methods

The present retrospective study was conducted at Queen Mary Hospital (QMH), a tertiary hospital in Hong Kong, and at Lady Helen Woo Women's Diagnostic and Treatment Centre (WDTC), a primary-care center staffed by nurses and primary-care physicians at the University of Hong Kong offering cervical smear screening services. Patients attending the colposcopy clinic at QMH between January 1, 2005 and December 31, 2006, were identified from the QMH database and patients referred to the WDTC for cervical smear screening within 3 months of colposcopy were considered for inclusion in the study. Any patients remaining at QMH for follow-up including those with persistent high-grade lesions, challenging vaginal examinations, non-cervical lesions, or co-existing gynecologic problems were excluded from the analysis, as were patients who requested to undergo follow-up at QMH or elsewhere and those who were diagnosed with gynecologic cancer immediately following colposcopy. The study protocol was approved by the institutional review board of the University of Hong Kong and the Hong Kong West Cluster hospital authority; the institutional review board did not require informed consent to be obtained from patients for their data to be included in the study.

All patients attending QMH underwent conventional cytology and liquid-based cytology; when necessary, high-risk HPV status evaluations were performed at the QMH pathology laboratory. These same screening methods were utilized throughout the study period.

Patients' cervical smear results, colposcopy-directed biopsy results, and treatment results from QMH were retrieved from patients records and used as the baseline follow-up (FU0) findings; data from patients' subsequent three cervical smear results following referral (FU1, FU2, and FU3) were retrospectively retrieved from the WDTC database.

A simplified diagram of participant treatment and follow-up following anomalous cervical smear findings is outlined in Supplementary material S1. Patients who attended follow-up according to instruction were considered to be compliant with screening; a delay of 3 months was considered to meet the requirements of compliance to accommodate potential delays occurring owing to menstruation, illness, bad weather, difficulties securing an appointment at the clinic, and other unforeseeable circumstances. Patients who did not attend cervical smear screening within 3 months of scheduled follow-up were considered defaulters, and nurses at WDTC would attempt to contact them by telephone and mail to remind them to attend screening. Patient compliance was compared with historical data from 2002; this time point was selected because the shared care system had not been introduced and patients with anomalous colposcopy findings during this period would have completed all follow-up at QMH only.

Comparisons were also made between the findings from two groups of patients; those who attended three follow-up appointments at WDTC (regardless of whether a nurse had contacted them or not) and patients who failed to attend three follow-up appointments during the study period. Categorical variables were analyzed using the χ^2 test or Fisher exact test, and means or medians of continuous variables were compared using the independent *t* test or Mann–Whitney *U* test, where appropriate. Factors thought to potentially be predictive of patients failing to comply with prescribed follow-up were identified and those that differed significantly between the two groups of patients were included in a binary logistic regression. Study data were analyzed using SPSS version 20 (IBM, Armonk, NY, USA) and $P \leq 0.05$ was considered statistically significant.

3. Results

Data were available for 1841 patients who attended the colposcopy clinic at QMH during the study period and 833 patients who were referred to WDTC for screening were included in the study. The mean age of the 833 patients was 40.8 ± 10.6 years and the mean duration of follow-up among patients who completed FU3 was 20.9 ± 4.8 months. The mean intervals between FU0 and FU1, FU1 and FU2, and FU2 and FU3 were 7.0 ± 3.9 months, 7.6 ± 3.8 months, and 7.3 ± 2.9 months, respectively. For patients who had low-grade or normal cytology and histology findings at FU0, and normal results of FU1 and FU2 screening, the mean interval between FU2 and FU3 was 7.9 ± 3.1 months. For patients with high-grade cytology or histology at FU0, or with anomalous results from FU1 and FU2 screening, the mean interval between FU2 and FU3 was 6.9 ± 2.7 months.

When including only patients who attended follow-up without prompting from WDTC staff, FU1 screening was attended by 706 (84.8%) patients; however, compliance decreased to 561 (67.3%) patients by FU3 (Table 1); these findings were similar to those observed in patient data from 2002 (Table 2).

During the study period, 348 patients (41.8%) failed to attend at least one follow-up screening at WDTC; however, of these patients, 172 (49.4%) did return for follow-up after being contacted by a nurse. Among the 176 patients who did not attend further screening at all, it proved impossible to successfully contact 92 of them by telephone or mail. When the 172 patients who attended screening after being contacted were included as having completed follow-up, the numbers of patients attending FU1, FU2, and FU3 were 795 (95.4%), 747 (89.7%), and 657 (78.9%), respectively. These figures were similar to the historical data from 2002, where among 582 patients, 529 (90.9%), 515 (88.5%), and 480 (82.5%) attended FU1, FU2, and FU3, respectively.

The complete cohort was stratified into two groups (Fig. 1) based on whether patients completed three follow-up screenings at WDTC or not. After including patients who returned for screening after being contacted by staff from WDTC, 657 patients completed FU3 and 176 patients did not. The demographic data for each group are listed in Table 3. Significant differences were observed between the two groups in terms of the number of participants who were aged younger than 50 years, who were single, had a history of smoking, were nulliparous, had more than one lifetime sexual partner, and had not previously undergone treatment related to cervical cancer screening prior to being referred for screening at WDTC. Patients with initial screening findings of at least CIN 2/3 lesions or adenocarcinoma in situ had a higher incidence of attending screening in comparison with patients with normal histology or low-grade lesions; however, the difference was not significant (82.8% vs 77.0%; $P = 0.058$). In the multivariate analysis, patients being aged younger than 50 years, having a history of smoking, and having not undergone any prior treatment related to cervical smear screening were associated with increased odds of not attending all three follow-up screenings (Table 4).

4. Discussion

The present study demonstrated that non-compliance with cervical smear follow-up was a problem, regardless of whether follow-up was performed at primary care centers (as in WDTC) or in tertiary centers,

Table 1
Patient compliance with follow-up after being referred from a tertiary healthcare facility for cervical smear monitoring at a primary care facility.[a]

Most severe histology diagnosed at FU0	Patients complying with follow-up prior to being reminded		
	FU1	FU2	FU3
Normal or cervicitis (n = 358)	298 (83.2)	259 (72.3)	225 (62.8)
Low-grade lesions (n = 449)	387 (86.2)	344 (76.6)	319 (71.0)
High-grade lesions (n = 4)	4 (100)	4 (100)	4 (100)
CIN, unspecified grade (n = 6)	6 (100)	5 (83)	6 (100)
Unsatisfactory colposcopy (n = 5)	2 (40)	4 (80)	2 (40)
None (n = 11)	9 (82)	7 (64)	5 (45.5)
All patients (n = 833)	706 (84.8)	623 (74.8)	561 (67.3)

Abbreviations: FU0, initial colposcopy performed at a tertiary facility; FU1, first primary-facility cervical smear; FU2, second primary-facility cervical smear; FU3, third primary-facility cervical smear; CIN, cervical intraepithelial neoplasia.

[a] Values are given as number (percentage).

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