Verification of the accuracy of cervical cytology reports in women referred for colposcopy

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Summary

Objective: To verify the accuracy of cervical cytology in correlation with colposcopic and histological findings. *Design/Setting/Population/Methods:* In this retrospective chart review study 545 women, referred to the outpatient clinic for colposcopy, were included in the study. During the 4-year study period, two consultants performed the colposcopies and further necessary procedures, whereas patient charts were reviewed by two of the co-authors. *Results:* The median age of the study population was 35 years (range: 16-65). Thirty-four percent of the cases were new and 11% of the women were referred after receiving their first ever cervical smear. Ninety-two percent (503/545) of the colposcopies were satisfactory. Concordance between colposcopic findings and the histology report was 87%, whereas concordance between cytology and histology reports was as low as 60% for HPV-related lesions, 72% for LGSIL and 86% for HGSIL. "See and Treat" was offered to 53 (10%) women and 48 (90.5%) of them had high-grade lesions on histology justifying treatment at the first visit. *Conclusions:* The concurrent use of cytology and colposcopy provides better chances for earlier detection of lesions demanding intervention; 80%-90% of patients with severe dyskaryotic smears will have a histology report confirming CIN III. See and treat management can be decided sometimes, if supported by the colposcopic findings, and an audit should confirm accuracy to, at least, 90% of cases.

Key words: CIN; Cervical screening; Smear test; LLETZ; HPV.

Introduction

Papanicolaou's seminal publication in the 1940s, which showed that exfoliated cervical cells could be reliably harvested and spread, fixed and stained on a glass slide, laid the foundations of cervical cancer screening [1]. In 1968, Junger and Wilson published a list of ten criteria against which screening strategies could be judged [2]. Our understanding of cervical carcinogenesis has progressed immensely during the last 30 years, leading to the realization that the HPV family of viruses is an essential factor in the causation of the disease. The gradual increase in the use of exfoliative cytology in the late 1960s and 1970s naturally resulted in an increase in detecting abnormal cells. Cervical cytology is the most widely used screening tool, despite the fact that it has a false-negative rate of 25-50% [3, 4]. Other disadvantages include cost, need for expertise, need for repeat visits for reports, etc. Colposcopy of the cervix is currently one of the second-line investigative modalities in the management of cervical disease [5-8]. As shown repeatedly, colposcopy can be used as a first-line screening tool as well [5]. However, cost of equipment, technical difficulties and the expertise required, have prevented its widespread use as a screening tool. Combining colposcopy with cytology increases the diagnostic accuracy [9]. Treatments such as laser and large loop excision of the transformation zone (LLETZ) have since been introduced. The incidence of cervical cancer following treatment of CIN III is now less than 1% and the consequent mortality rate is reported to be lower than 0.5% [10].

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Materials and Methods

This is a retrospective analysis using data from the colposcopy clinic of our department identifying those patients (n = 545) who underwent colposcopic examination from 2003 to 2006. The following data, which were based on spontaneous screening material, were retrieved for each woman: age, colposcopic impression, procedure performed, biopsy result. The age of these women was between 18 to 65 years old (mean 35) and 24% of them (n = 130, mean 32.5) were smokers (Table 1). Over the study period 17 women less than 20 years old underwent colposcopy examination due to abnormal smears (16-19 years). Punch biopsies were performed on 343 women (63%). See and treat management was offered to 53 (10%) women (Figure 1). The colposcopies were satisfactory in 92% (n = 503) of cases (Table 2). The percentage of new cases over these four years was 34% (n = 186, mean 46.5. For 11% of the study group (n = 61, mean = 15) the referral smear was their first ever smear test (Table 1).

Results

The majority of smear test results of the women in our study (273) were low-grade squamous intraepithelial neoplasias (LGSIL) (50%), followed by 163 high-grade squamous intraepithelial neoplasias (HGSIL) (30%). Only 10% (20%) had low grade or inadequate smears. Over the study period of four years (2003-2006) the correlation between colposcopic opinion and pathology result was 87% (Table 1, Figure 2). Thirty percent of the pathology reports came back as chronic cervicitis ± HPV infection, 33% as CIN I and 30% as high grade lesion CIN II-III (Figure 3, Table 3). Only 9% of reports came back as normal. Two cases of invasive carcinoma and

Fig. 1

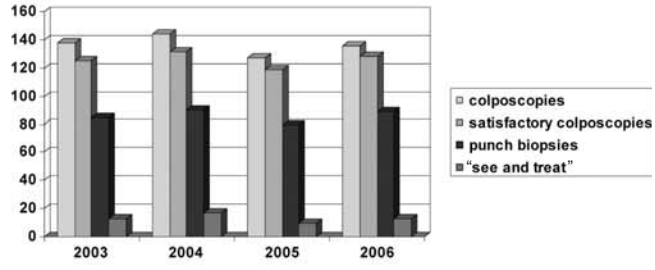

Fig. 2

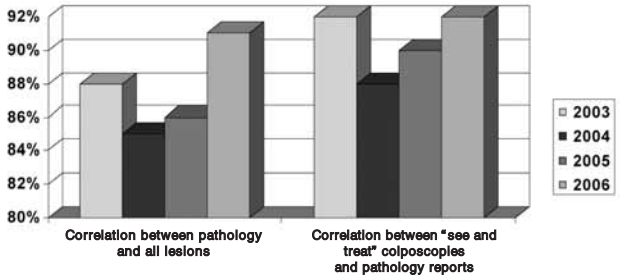

Fig. 3

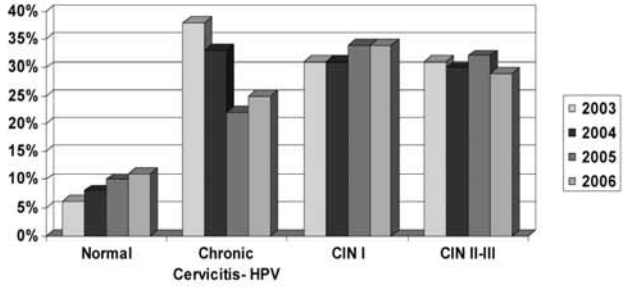

Figure 1. — Number of satisfactory colposcopies, punch biopsies and see and treat cases.

Figure 2. — Correlation between pathology and colposcopy.

Figure 3. – Results of punch biopsies for the period 2003-2006.

Table 1.

	Age	Smokers	1st Pap test	Mean time interval between smear and colposcopy (days)	Mean time interval between colposcopy and pathology report (days)	Correlation between pathology report and colposcopic opinion for all lesions
2003	19-65	32 (23%)	15 (11%)	30	22	86 (88%)
2004	20-65	41 (28.5%)	18 (12.5%)	32	23	91 (85%)
2005	19-65	29 (23%)	12 (9%)	31	22	77 (86.5%)
2006	18-65	28 (20.5%)	16 (12%)	31	21	91 (89%)
Total	Mean 35	130 (mean 32.5-24%)	61 (mean 15-11%)	31 (mean 86-87%)	22	345 (mean 86 87%)

Table 2.

	Colposcopic examinations	Biopsies-patients (punch)	LLETZ post biopsy	LLETZ see and treat	New patient	Satisfactory colposcopies
2003	138	85	49	13	48 (35%)	125 (90.5%)
2004	144	90	63	17	53 (37%)	131 (91%)
2005	127	79	44	10	40 (31.5%)	119 (94%)
2006	136	89	50	13	45 (33%)	128 (94%)
Total	545	343 mean 86 (63%)	206	53 mean 13 (10%)	186 mean 46.5 (34%)	

other pathologies like warts and VIN were also identified. See and treat management was offered to 53 (10%) women and 48 (90.5%) of them had high grade lesions on histology justifying treatment at the first visit (Table 4). Seventeen women less than 20 years old underwent colposcopy examination due to abnormal smears (16-19 years). Two of them had CIN I and one CIN II. The majority of these women (14/17) were normal or had minor pathology (Figure 3). Mean time interval between smear and colposcopy was 31 days and mean time interval between colposcopy and pathology report was 22 days.

Discussion

The aim of a cervical cancer screening program is to screen for precancerous changes in the cervical epithelium which can be treated, thereby reducing the incidence of cervical cancer. Although cervical cancer screening has never been subjected to a randomized trial, few argue against its success in promoting women's health. It has been estimated from systematic reviews that routine primary cervical screening carries a 50-70% sensitivity to detect CIN III [11].

The findings of HGSIL are a reason for referral for urgent colposcopic assessment. HGSIL smears usually correlate with a high-grade CIN lesion, which will eventually require treatment. Of patients with HGSIL 80%-90% will have a histology report confirming CIN III [12]. CIN is identified, over a 10-year period, in up to 10% of women following treatment for CIN, this representing both persistent and recurrent disease [13, 14].

"See and treat" was offered to 53 women in our study and 90.5% of them had-high grade lesions on histology justifying treatment at the first visit. This small over-treatment rate is acceptable, since the high correlation rate between colposcopic opinion and histology clearly demonstrates a high standard of colposcopic acumen. Hence, a see and treat management could be decided sometimes on the grounds also of the colposcopic findings and an audit should confirm accuracy to at least 90% of cases [15]. Actually a lot of women prefer to have the

Table 3.

Biopsies Results (punch + LLETZ see and treat)	Normal	Chronic cervicitis ± HPV	CIN I	CIN II-III	Invasive carcinoma	Other pathologies
2003	6 (6%)	37 (38%)	33 (33.5%)	31 (31.5%)	1	3 VIN, 4 warts
2004	9 (8%)	35 (33%)	33 (31%)	30 (30.5%)		1 VIN, 4 warts
2005	9 (10%)	20 (22.5%)	30 (34%)	29 (32.5%)	1	2 VIN, 1 warts
2006	11 (11%)	26 (25.5%)	35 (34%)	30 (29.5%)		1 VIN, 2 warts
Total	35 (mean 9-9%)	118 (30% mean 29.5)	131 (mean 33 33%)	120 (mean 30 30%)	2	7 VIN, 11 warts

Table 4.

	See and treat	Correlation of "see and treat" colposcopies with pathology reports	Women less than 20 years old who had colposcopy	CIN I-II	Minor pathology (cervicitis, HPV)
2003	13	12 (92%)	4	1 CIN I	3
2004	17	15 (88%)	2	0	2
2005	10	9 (90%)	5	1 CIN II	4
2006	13	12 (92%)	6	1 CIN I	4
	53 mean 13 (10%)	48 mean 12 (90.5%)	17 mean 4 (3%)	3 (mean 1)	13 (mean 4)

treatment at their first visit, instead of having directed punch biopsy and a second visit for treatment, subsequent to histologic diagnosis. They find this approach less stressful. This way of approach has the advantage of fewer return clinic visits which in turn means more available clinic appointments and thus shorter waiting times leading to more streamlined efficient service.

The majority of the women bellow 20 years old who participated in our study had normal colposcopies or had minor pathology. There is no justification for including teenagers in the cervical screening program. This could lead to more harm than good [16]. The incidence of cervical cancer in the younger than 25-year age group is very low and the prevalence of transient HPV infection after coitarche is high [17]. One in six smears taken in this age group is abnormal. Many cases of this prevalent low-grade disease would have resolved spontaneously if screening were started at a later age [18]. Screening in this age group often results in unnecessary colposcopies, with the resultant possible consequences of increased anxiety and possible overtreatment. Even a CIN III lesion in 30% to 70% of cases may progress to invasive disease over a period of 10-12 years, so it is safe to wait until the age of 20 to perform a smear [17-19].

CIN is usually treated by local ablation or excision unless there are clinical indications to the contrary. Provided that the pathologist is certain that the resection margins of the biopsy are free from disease, it can be assumed that the whole lesion has been removed. The successful treatment of one area of CIN does not preclude the future development of further areas of CIN or VIN. Also treatment that fails to remove the whole of the lesion may result in patients' having more than one focus of residual CIN and therefore the adequacy of secondary ablation is much harder to assess. The subsequent detection of additional foci of disease is therefore not necessarily indicative of treatment failure.

Conclusion

Cervical cancer screening is a multidisciplinary activity in which the various components of a program must work with the same goals, protocols and definitions in order to be objective. A cervical biopsy is part of the screening process. It follows a referral, the need for which has been indicated by the cervical smear report. A biopsy has several functions. It confirms, alters or refutes the suggested diagnosis and, in some cases, it adequately treats the lesion. When a well organized screening program exists, it is expected that cytology reports will be available to the colposcopist (when examining the woman) and to the histopathologist (when diagnosing biopsies). Similarly, clinical reports must be available to the histopathologist. In this way, professionals will have access to all the necessary information and be able to exercise their judgment and make appropriate recommendations.

References

[1] Papanikolau G.N., Traut H.F.: "The diagnostic value of vaginal smears in carcinoma of the uterus". *Am. J. Obstet. Gynecol*., 1941, *42*, 193.

[2] Wilson J.M.G., Jungner G.: "Principles and Practice of Screening for Disease". WHO Public Paper 34. Geneva ;WHO; 1968

[3] Ficsor G., Fuller S.K., Jeromin J.L., Beyer R.D., Janca F.C.: "Enhancing cervical cancer detection using nucleic acid hybridization and acetic acid tests". *Nww Pract.,* 1990, *15,* 24.

[4] Van Le L., Broekhuizen F.F., Janzer-Steele R., Behar M., Samter T.: "Acetic acid visualization of the cervix to detect cervical dysplasia". *Obstet. Gynecol*., 1993, *81,* 293.

[5] Mitchell M.F., Schottenfeld D., Tortolero-Luna G., Cantor S.B., Richards-Kosham R.: "Colposcopy for the diagnosis of squamous intraepithelial lesions: a meta-analysis". *Obstet. Gynecol.,* 1998, *91,* 626.

[6] Keijser K.G.G., Kenemans P., vander Zander P.H.T.H., Schijff C.P.T., Vooijs G.P., Rolland R.: "Diathermy loop excision in the management of cervical intraepithelial neoplasia: diagnosis and treatment in one procedure". *Am. J. Obstet. Gynecol.,* 1992, *166,* 1281.

[7] Chia K.V., Fayle R.J.S., Sobowale O.A.: "Efficacy of large loop excision of the transformation zone for cervical intraepithelial neoplasia". *Aust. NZ J. Obstet. Gynaecol*., 1993, *33,* 287.

[8] Gold M., Dunton C.J., Murray J., Macones G., Hanan C., Carlson J.A.: "Large loop electrocautery excisional procedure: therapeutic effectiveness as an ablation and a Ionisation equivalent". *Gynecol. Oncol*., 1996, *61,* 241.

[9] Lozowski M.S., Mishriki Y., Talebian F., Solitare G.: "The combined use of cytology and colposcopy in enhancing contery diagnostic accuracy in preclinical lesions of the uterine cervix". *Acta Cytol.,* 1982, *26*, 285.

[10] Soutter W.P., de Barros Lopes A., Fletcher A., Monaghan J.M., Duncan I.D., Paraskeivaidis E. *et al*.: "Invasive cervical cancer after conservative therapy for cervical intraepithelial neoplasia". *Lancet,* 1997, *349,* 978.

[11] Nanda K., McCrory D.C., Myers E.R., Bastian L.A., Hasselbad V., Hickey J.D. *et al*.: "Accuracy of the Papanikolaou test in screening for and follow-up of cervical cytologic abnormalities: a systematic review". *Ann. Intern. Med*., 2000, *132*, 810.
[12] Souter W.P., Fletcher A.: "Invasive cancer of the cervix in women with mild dyskaryosis followed up cytologically". *British Med. J*., 1994, *308*, 1421.
[13] Histopathology Reporting in Cervical Screening, Working Party of the Royal College of Pathologists and the NHS Cervical Screening Programme 1999, NHSCSP Publication No 3.
[14] Paraskevaides E., Koliopoulos G., Alamonos Y.Malamou-Mitsi V., Lolis E.D., Kitchener H.C.: "Human papillomavirus testing and the outcome of treatment for cervical intraepithelial neoplasia". *Obstet. Gynaecol*., 2002, *98,* 833.
[15] Solomon D., Schiffman M., Tarone R.: "Comparison of three management strategies for patients with atypical squamous cells of undetermined significance: baseline results from randomized trial". *J. Nat. Cancer Inst*., 2001, *93,* 293.
[16] NHSCSP Publication No 8, 1997, NHS Cervical screening 2002 Review.
[17] Collins S., Mazloomzadech S., Winter H. *et al*.: "High incidence of cervical HPV infection in women during their first sexual relationship". *Brit. Med. J*., 2002, *109,* 96.
[18] Sasieni P., Adams J., Cuzick J.: "Benefit of cervical screening at different ages: evidence from the UK audit of screening histories". *Br. J. Cancer,* 2003, *89,* 88.
[19] Progress in cervical screening. Scientific Advisory Committee. Opinion Paper 7. Guidelines. Royal College of Obstetricians and Gynecologists, 2006.

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