

# The inflammatory cervical smear: a study in general practice

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**SUMMARY.** This study set out to determine whether the term 'inflammatory' in a cervical smear report implies underlying infection or whether it could be masking cancerous or precancerous changes. Of 826 smears taken in one practice over one year, 42 demonstrated some degree of inflammatory change. Thirty four of these women presented for swabs and almost half (47%) had a microbiologically proven infection. This group was further subdivided, and of those whose smears were reported as simple 'inflammation', just over one third (35%) were infected but of those whose smears were reported as 'severe inflammation', over two thirds were infected (73%). The commonest organisms isolated were *Gardnerella vaginalis* and *Candida albicans*. It would therefore appear to be worthwhile to treat patients who report severe inflammation with metronidazole and with anti-fungal pessaries before the smear is repeated.

Following treatment two women went on to show dyskaryosis within five months. On colposcopy one of these women was found to have invasive cervical squamous cell carcinoma. It is concluded that whether women with inflammatory smears are treated or not, it is mandatory to repeat the smear, ideally within five months.

## Introduction

It was noticed that a persistent number of smear results returned to our general practice contained the unsettling report 'inflammatory changes, please treat and repeat'. This led us to ask several questions: Was this a common report? Did all these women have an underlying infection with or without symptoms? If infection was found and treated would the smear then revert to normal? Did the presence of cervical ectopy or cervicitis indicate a higher incidence of inflammatory change? Could this inflammation be masking underlying dyskaryosis or worse?

It was decided to undertake a prospective study in an attempt to answer these questions.

## Method

The study was carried out in a four doctor urban practice of 7000 patients which operates a call/recall system for cervical smears.

The cytological terms 'inflammation', 'severe inflammation' and 'dyskaryosis' have all been clearly defined.<sup>1</sup> For the purposes of this study, the use of the term infection implies microbiologically proven infection. This was deemed to be present when an organism of recognized pathogenicity was detected, or an organism of potential pathogenicity was isolated in pure culture in the presence of pus cells.

On receipt of a cervical smear result reporting inflammation

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Submitted: 17 August 1989; accepted: 19 December 1989.

© British Journal of General Practice, 1990, 40, 238-240.

the following procedure was followed. The woman was requested to attend the doctor, who examined the cervix and took two cervical swabs. The first was placed in Stuart's transport medium, the second in special medium for *Chlamydia trachomatis*. All specimens reached the laboratory within three hours. Any obvious clinical infection was treated accordingly. All women were requested to return in a week to discuss the findings of their swabs and future management. At this second interview with the doctor, all women whose swabs showed infection were treated appropriately. Those who had negative microbiology were given a course of tetracycline to cover possible *C trachomatis* infection. The women were asked to return in three months for a repeat smear. Women failing to return were contacted by post. Only those women found to have dyskaryosis at any stage were referred for colposcopy.

The study lasted for one year and began in November 1987.

## Results

A total of 826 smears were taken during the year. Of these, 30 (4%) were reported as 'inflammatory' and a further 12 (1%) as 'severely inflammatory'. Thus, a total of 42 smears (5%) demonstrated some degree of inflammatory change. The mean age of the 42 women with inflammatory smears was 38 years.

The month in which the inflammatory smear was taken was investigated. There did appear to be a seasonal variation in the proportion of inflammatory smears, with significantly more in December, January and February than in June, July and August (chi-square test,  $P < 0.01$ ) (Figure 1).

### First smear

The appearance of the cervix at the time of taking the first smear was noted for the 42 women with inflammatory smear results (Table 1). In addition, the contraceptive and/or hormonal status of the women and any symptoms reported were noted (Table 1). The records showed that three of the women had previously had smears showing dyskaryosis and another two had previous smears reporting inflammation. One of the latter two women had two previous reports of inflammation.

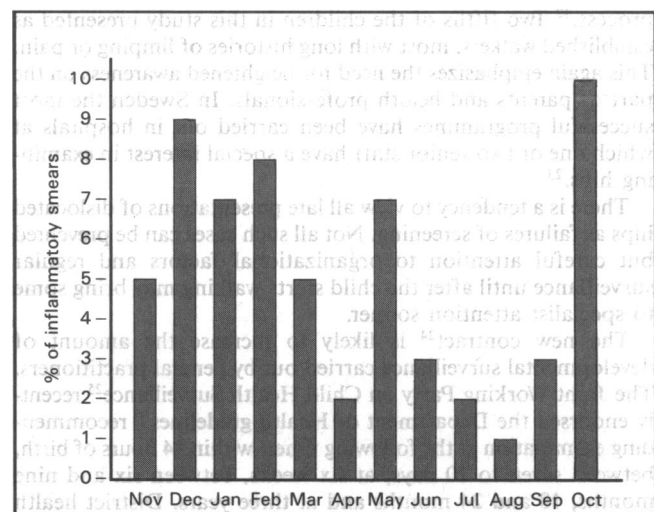


Figure 1. Monthly variation in percentage of inflammatory smears.

**Table 1.** Appearance of the cervix, relevant contraceptive and/or hormonal status and symptoms at the time of taking a smear among women whose first smear was inflammatory.

	Number (%) of women	
	First smear (n = 42)	Second smear (n = 37)
<i>Appearance of cervix</i>		
Ectopy	15 (36)	21 (57)
Cervicitis	5 (12)	3 (8)
Polyps	3 (7)	0
Normal	19 (45)	13 (35)
<i>Contraceptive and/or hormonal status</i>		
Pregnant	1 (2)	0
Postnatal (within 12 weeks)	0	1 (3)
Taking oral contraceptive	9 (21)	5 (14)
Intrauterine contraceptive device in place	2 (5)	1 (3)
Taking other hormones	2 <sup>a</sup> (5)	1 <sup>b</sup> (3)
None of these	28 (67)	29 (78)
<i>Symptoms<sup>c</sup></i>		
Irritation and/or abdominal pain	6 (14)	4 (11)
Vaginal discharge	18 (43)	3 (8)
Postcoital bleeding	2 (5)	0
Intermenstrual bleeding	1 (2)	0
Asymptomatic	21 (50)	30 (81)

<sup>a</sup> One taking tamoxifen, one progesterone pessaries. <sup>b</sup> Taking tamoxifen.

<sup>c</sup> Some women had more than one symptom.

### Swab results

All 42 women were asked to attend the surgery to have swabs taken — 34 (81%) presented. In this group 16 cases of proven infection were found. Among the women whose smears were reported as 'inflammatory' the incidence of infection was 35% (8/23) and among those whose smears were 'severely inflammatory' the incidence of infection was (73%) (8/11). The mean time interval between the original inflammatory smear and the taking of swabs was 34 days. The mean time between swab taking and treatment was eight days.

The organisms isolated from the 16 swabs were *Gardnerella vaginalis* (seven swabs), *Candida albicans* (five), *C trachomatis* (two), *Trichomonas vaginalis* (one) and *Streptococci* (two group B, one group G). The role of *G vaginalis* as a causative agent in gynaecological infection remains controversial but when its growth was reported and pus cells and cluë cells were seen on microscopy, it was felt justified to include it as a pathogen.

### Second smear

Of the original 42 women, 37 (88%) returned for a second smear to be taken. The mean time interval between the first and second smears was 145 days. Two of the women with an original inflammatory smear went on to show dyskaryosis within five months. At colposcopy one of these women was found to have invasive squamous cell carcinoma and the other chronic cervicitis. Three of the second smears remained inflammatory despite treatment. Further smears were then taken and two became normal. However, one remained inflammatory and the woman is awaiting colposcopy.

The appearance of the cervix at the time of the second smear is shown in Table 1. The difference between the number of clinically abnormal cervixes seen at the first and second smear was not statistically significant (chi-square test). The relevant contraceptive and/or hormone status of the women and the

presence of symptoms are also shown in Table 1. Significantly fewer women had symptoms at the time of the second smear than at the first (chi-square test,  $P < 0.01$ ).

### Discussion

The subjective impression that large numbers of smears taken in the practice were being reported as inflammatory was shown to be false as this applied to only 5% of the annual total.

The results of this study indicate that the presence of cervical ectopy or cervicitis do not imply a greater chance of an inflammatory smear. The difference between the number of clinically abnormal cervixes seen at the first and second smears was not statistically significant. This indicates that the appearance of the cervix would not have helped in predicting the initial inflammatory smear. Another question asked at the outset was whether women with inflammatory smears suffer symptoms associated with their putative infection. This study suggests that they do, as there were significantly fewer women with symptoms at the time of the second smear.

Overall, nearly half of the women with inflammatory smear results showed a microbiologically proven infection, an infection for which none of them had sought medical advice. There was a high chance of any woman whose smear was reported as 'severely inflammatory' having an infection. It is therefore suggested that all women whose smears are reported as 'severely inflammatory' should be treated with a combination of metronidazole, and anti-fungal pessaries (clotrimazole<sup>2</sup>). A repeat smear should be taken a few months later. Those women whose smears are reported as simply 'inflammatory' should have a repeat smear in five months and if this is still inflammatory they should be treated and/or investigated by swabs. Considerably different infection pick up rates have been found by other investigators.<sup>3,4</sup> Hick and colleagues<sup>3</sup> found an infection pick up rate of 97% among women with inflammatory smears attending a genitourinary medicine clinic while Toon and colleagues<sup>4</sup> found a pick up rate of only 10% among women who had been referred to a gynaecology clinic by their general practitioners for various gynaecological symptoms not associated with cervical disease.

The question of whether or not to treat a possible *C trachomatis* infection with a tetracycline remains difficult to answer. The sequelae of a *C trachomatis* infection can be serious but these risks must be weighted against the potential adverse effects of a lengthy course of tetracycline therapy.

It is interesting to note that the relative proportions of inflammatory to normal smears is considerably higher in the winter than the summer months. In fact, the incidence of inflammation varied from 1% to 10%. There was no obvious reason for this seasonal difference.

Two women in this study were found to have dyskaryosis. At colposcopy no cases of cervical intraepithelial neoplasia were detected. One woman had simple chronic cervicitis and the other was found to have invasive squamous cell carcinoma. In other studies where colposcopy was performed on all the subjects, the incidence of cervical intraepithelial neoplasia has varied — Hicks and colleagues found a 10% incidence,<sup>3</sup> Kirkman and colleagues found an incidence of 33% among women with persistent inflammatory smears attending a family planning clinic,<sup>5</sup> and Toon and colleagues had a 12% pick up rate.<sup>4</sup>

A study by Frisch has shown that the subsequent smears of women who had inflammatory smears are more likely to show abnormalities.<sup>6</sup> False negative smears compromise the effectiveness of cervical screening and on re-examination of the original inflammatory slide Frisch found that 4% of abnormal smears were under-reported as inflammatory. In another study, Frisch suggests that colposcopy of women with inflammatory

smears may be a cost effective method of finding cases of cervical intraepithelial neoplasia missed by cervical screening.

One of the questions asked at the outset was whether an inflammatory smear report could be masking underlying dyskaryosis or worse. The fact that one woman was shown to have invasive squamous cell carcinoma within one year of her inflammatory smear result highlights the importance of repeating these smears. Whether women with inflammatory smears should receive treatment may be a subject for debate in certain cases but repeating the smear, ideally within five months, should be mandatory.

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