

False positive results do not have a negative effect on reattendance for subsequent breast screening

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Abstract

Objectives—To find out whether a false positive breast screening result has a negative effect on subsequent screening attendance. Also considered was the proportion of women who had ever failed to reattend for screening, having previously attended routinely.

Design—The study was a retrospective cohort design.

Setting—Data from the call and recall records of the Central and East London Breast Screening Service (CELBSS) were used.

Participants—Women who had been invited to attend for breast screening by the CELBSS during 1997.

Main outcome measures—Subsequent attendance or non-attendance for the next routine breast screen, after a false positive screening result.

Results—A substantial number of women failed to reattend for a breast screen during their screening history, having attended for their previous routine breast screen. No differences in the rates of reattendance were found between those who had previously received a false positive result and those who had not.

Conclusion—From the results obtained in the present study it would seem that the experience of a false positive breast screen does not deter women from reattending in the future. However, many women living in inner city areas who attend for an initial breast screen are failing to attend for subsequent routine mammograms. This may have a deleterious effect for these women in terms of the benefits of attendance for regular screening.

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Keywords: breast cancer screening; false positive; reattendance

In the United Kingdom a national breast cancer screening programme was launched following the recommendations of the Forrest committee.¹ The NHS breast screening programme started screening in 1989 and was fully operational by 1991. Within the programme, every woman between 50 and 64 years registered with a general practitioner is invited for routine screening once every 3 years. Beyond 64 years, women are still eligible to be screened; however, they are not invited routinely, rather they can call their local breast screening unit and request a mammogram.

Achieving a high rate of attendance for routine screening is essential for the success of the breast screening programme. Thus far the evidence suggests that the programme has achieved its 70% uptake target in England (75.4% uptake in 1997-98²). To maximise attendance, it is essential to understand why some women attend whereas others do not. Consequently, over the past 20 years numerous studies within the United Kingdom and elsewhere have investigated the factors associated with participation. Many factors have been found to be associated with the uptake of breast cancer screening including sociodemographic factors—such as housing tenure^{3,4} and marital status.^{5,6} Also, psychological factors—such as perceptions of susceptibility,⁷ attitudes,^{3,6,8} and perceptions of behavioural control³ have all been found to be positively associated with the uptake of mammography screening.

Maintaining a high rate of reattendance at each subsequent round of screening is also very important, and although most women do reattend, recent estimates suggest that between 8%–10% of women do not come back when subsequently invited.^{2,9} Understanding why some women come back for subsequent screening whereas others do not is of equal importance to understanding why women attend in the first place. Although some of the factors associated with attendance for initial screening may also explain why some women reattend whereas others do not, we cannot automatically assume that the same factors are relevant at different rounds of screening. One issue that may be especially important when women are deciding to reattend is whether they have previously experienced an abnormal breast screening result, which after further assessment was concluded to be negative for malignancy (false positive).

Several studies have considered the potential effects of a false positive result on subsequent screening behaviour, reporting no negative association, however, these studies typically relied on self reports of behaviour.^{10,11} One British study that used an objective measure of reattendance behaviour (call and recall records) also reported no significant differences in the reattendance rate of women who had previously experienced a false positive result, compared with those who had not.¹² However, the number of false positive women included in this study was very low (n=50). Two other studies reported that the frequency of mammography among women who had had

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a false positive screen actually increased after their experience.^{13 14}

With a more objective end point of behaviour (derived from the call and recall records of the screening service), the present study aimed to clarify whether a false positive result has a positive, negative, or no effect, on the subsequent breast screening behaviour of women living within an inner city health district. As well as this, the present study also aimed to establish whether there were any differences between women who were placed on early recall after a false positive result (asked to come back for routine screening before 3 years) and those who were placed on routine recall (placed back on a triennial schedule). This issue is important as early in the history of the breast screening programme many women who had to attend for further assessment, were subsequently asked to reattend earlier (placed on early recall) than they would normally expect. The decision to place a woman on early recall was meant to act as a means of keeping a close watch on an ambiguous result, which may have presented later as a serious problem. The experience of being placed on early recall could have affected the perceptions of these women of breast screening—for example some of these women might wonder why after having at least two mammograms at routine screening and further assessment, their result was still not clear—or their perceptions of their risk of breast cancer, and as a consequence had an effect (either positive or negative) on their subsequent screening behaviour. The policy of the breast screening programme has subsequently changed, and currently the aim of the programme is to ascertain a definitive diagnosis as part of the initial assessment. With the call and recall records of the service it is possible to establish if there were any differences between women placed on early or routine recall in terms of their subsequent behaviour after an episode of further assessment.

Finally, as well as the effect a false positive result has on subsequent breast screening behaviour, the current study also considered the rate of non-reattendance among the women in this cohort. Although previous studies have shown that between 8%–10% of women decide not to reattend after previously attending routinely, this issue has not been explicitly considered among women living in inner city areas. From the regional variations reported in the uptake of routine breast screening, a larger proportion of these women might be expected not to reattend routinely.

Methods

The study was a retrospective cohort design, involving a review of the call and recall records of 5655 women from the East London and the City of London health district, invited for breast screening by the Central and East London Breast Screening Service (CELBSS). All of these women were invited for screening in 1997, but were not on the same screening schedule—that is, for some women the 1997 invitation was for their second routine breast

screening, for others it was their third, and for a few it was their fourth or fifth invitation. These records offer the most objective means of ascertaining what women do when invited routinely. Repeat or incident screening was the study objective and the term subsequent screening behaviour is used to describe repeat screening behaviour (attend or non-attend) in women who had attended for at least one routine breast screening and who had been invited for at least one subsequent screen.

Women who were being invited for routine screening for the first time in 1997 were not included in this cohort and those women who had been invited previously, but who had never attended (no experience of routine NHS breast screening), were also excluded from the cohort. Those women who had attended for at least one routine screen but who had not attended for a routine screening after having attended at least once—for example, attend, non-attend, attend or attend, attend, non-attend, attend—were included in the cohort. All the women in the cohort had previously been screened routinely (at least once) as part of the NHS breast screening programme. Most of these women had been invited for either their second (n=2219) or third (n=3263) routine breast screen during the study year.

Because this study relied on a retrospective cohort, overall patterns of screening behaviour could be observed across years. Specific calendar years were not taken into consideration in this study—that is, how women behaved in any 1 year was not considered. What is of interest is how women behave subsequently having ever attended for a routine screening and having ever had a false positive screening result.

Results

Within the study cohort, excluding women who had a false positive result the first time they attended (n=248) and women who defaulted* the first time they attended (n=6), 3841 women (71%) who ever attended for an initial NHS breast screening, reattended for their first subsequent screen and 1560 (29%) did not.

In their screening history 367 women (6.5%) had ever experienced at least one false positive breast screen. Of these, 72 women (19.6%) experienced this result at their most recent screen (during 1997) and consequently, none of these cases were included in the analyses (no records of their reattendance behaviour beyond their 1997 screen, as the study did not go beyond this year). Of the women who had had a false positive result, 195 (53.1%) were placed on routine recall after further assessment and 100 (27.3%) were placed on early recall (most of which occurred earlier in the history of the screening programme).

The women who experienced a false positive result at their first screen and who were

*Those women who were asked to attend for further assessment but who decided not to may have attended privately for further assessment; so it was not possible to conclude whether they had had a false positive screen as they may have been diagnosed with a malignancy outside of the NHS.

Table 1 Behaviour at second screening

	Reattend 2nd screen n (%)	Non-reattend 2nd screen n (%)	Total
Clear result at 1st screen	3841 (71)	1560 (29)	5401
False positive at 1st screen	175 (70.6)	73 (29.4)	248
Routine recall	119 (73.5)	43 (26.5)	162
Early recall	56 (65)	30 (35)	86
Total	4016	1633	5649

reinvited routinely (n=248) did not behave differently at first subsequent screening (after the episode where they had had a false positive result) from those who had had a clear result at their first screen (table 1). Of the 5401 women whose result was normal and who were reinvited for a subsequent screen (5655 less 248 women with a false positive result and the six defaulters), 71% reattended (n=3841), compared with 70.6% (n=175) of those women with a false positive result who were reinvited ($\chi^2(df=1)=0.35$, $p=0.8$).

Similarly, there were no significant differences in reattendance behaviour between the two subgroups of women with a false positive result and the women had a clear result at the first screening ($\chi^2(df=2)=1.937$, $p=0.4$, table 1).

Finally, after a false positive result at first screen, although more women who were placed on routine recall (119, 73.5%) reattended than those placed on early recall (56, 65%), the difference was not significant ($\chi^2(df=1)=1.881$, $p=0.2$, table 1).

Discussion

The present study showed that there is substantial attrition among previous attenders for screening, in an inner city district of London. Among women who were ever invited to reattend, having previously attended for one routine screen, 29% did not reattend for their next routine screen. Although reattendance remains high nationally (of women who have attended routinely in the previous 5 years, 89.9% reattend), ensuring that the cost effectiveness of the programme is not threatened, this level of reattendance means that there are many women jeopardising their chances of maximising the benefits of attending regularly (assuming they are not attending elsewhere). The present analysis confirmed that a false positive result has no negative affect on subsequent screening behaviour, and the use of objective measures of behaviour strengthens this finding. Neither did the experience of having a false positive result seem to improve uptake. Finally, women placed on early recall after further assessment (now limited to about 0.25% of incidences) were equally likely to reattend as women placed on routine recall.

If replicated these findings represent good news for the screening programme. Although placing women on early recall may be seen to lengthen the period of uncertainty and therefore anxiety, there is no deleterious effect on women's subsequent screening behaviour. Counselling these women at the time of their referral is an essential feature of the service

provided by the CELBSS, and may help explain why there is no long term effect on behaviour. Although no measures of psychological morbidity were included in this study, we can make no conclusions about the psychological consequences of receiving a false positive result; however, based on the findings of other studies,¹⁰ it is likely that in the present study the women who had had a false positive result did experience increased levels of anxiety. Therefore, finding no negative effects on the subsequent screening behaviour of the women who had had a false positive result in the present study, allows us to suggest that the anxiety typically associated with a false positive result seems not to have a negative effect on the subsequent screening behaviour of the women in this cohort. This suggestion is of course based on the assumption that the women who had had a false positive result in this sample did experience increased anxiety as a consequence of having a false positive result. Ideally, the behavioural consequences of false positive results and how the psychological morbidity associated with these results interacts with the experience should be investigated with an objective measure of behaviour such as call and recall records.

This study should go some way towards reassuring those who suggest that false positive results limit the benefits of mammography screening. From the analysis, it is clear that women who experience false positive results do not regard the experience as reason enough for not reattending and continue to recognise the importance of regular attendance. The rate of non-reattendance among this inner city population is particularly worrying, however, and if typical of other inner city areas, represents a serious challenge to local screening programmes.

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