Impact of Second Reminder Invitation on Uptake of Screening and Cancer Detection in BreastCheck

Abstract:

This research aims to quantify the impact of reminder invitations on uptake and cancer detection in Ireland. Examination of BreastCheck’s clinical database (2000-2010) determined 448,974 who attended, 245,157 (54.8%) who waited until they received a reminder. Invitations by age group and screening phase with outcomes: uptake, recall rate, cancer detection and true positive rates. Of 819,182 first invitations, 9,555 (3.9%) who responded to first invitation were recalled for assessment after a positive mammogram. Women who attended, 18,135 (4.04%) who attended for screening after receiving the invitation were recalled (p=0.004). Younger, mainly initial women were more likely recalled for assessment after first invitation and after reminder; comparison by age group and screening phase with outcomes: uptake, recall rate, cancer detection and true positive rates. There was no difference between cohorts for cancer detection rate or true positive rate. Reminders increased uptake, supporting international evidence. For programme efficiency, attendance at first invitation is optimal. For maximum programme effectiveness, attendance must be encouraged with reminders.

Introduction

Mammography is a key tool in reducing mortality from breast cancer worldwide; however, reductions often accredited to organised screening activity. Women who delay screening until after a reminder invitation is sent are more likely screened. A high participation rate in any organised cancer screening programme is of utmost importance in achieving a reduction in mortality. Contact strategies for mammography screening have proven to be effective at increasing participation. Personal invitation letters with fixed appointment times have been attributed to very high participation rates in Finland. Several studies have explored additional interventions to increase participation. A multimodal reminder programme was deemed to be a credible system in a large health system, using postcard reminders, automated phone calls and live phone calls in Oregon, USA. A similar intervention in North Carolina USA deemed the use of a reminder, priming letter and telephone call, as the minimal intervention required to ensure regular adherence to mammography screening. Telephone reminder calls alone were considered suitable and effective in Belgium for increasing participation. A study conducted during the pilot of the Irish mammography screening programme in 1999 found that issuing a second mail invitation increased participation by a further 17.9%, while a third invitation was not cost effective for the observed return.

Methods

This was a retrospective study, using the BreastCheck clinical database over a ten year period (2000 to 2010). Previous non-attenders (women who did not attend any screening appointment in the previous screening round) were excluded from the analysis as BreastCheck do not offer a second invitation in a given round to these non-attenders. Women who were ineligible after first invitation, for example those who de-consented, women in follow up care for breast cancer, not contacted for terminal illness were also excluded from the analysis as they did not receive a reminder invitation. Data was examined by attendees overall, i.e. all women who attended over the ten year period, with further analysis by initial and subsequent attendees separately. The sample was taken from the screened population, examining women who attended screening after being issued the first invitation and after reminder; comparison by age group and screening phase with outcomes: uptake, recall rate, cancer detection and true positive rates. There was no difference between cohorts for cancer detection rate or true positive rate. Reminder invitations increased uptake, supporting international evidence. For programme efficiency, attendance at first invitation is optimal. For maximum programme effectiveness, attendance must be encouraged with reminders.

Results

There were 819,182 women eligible to receive both a first invitation and a reminder invitation if required. Of the first invitations mailed, 448,974 (54.8%) women attended for screening after receiving the invitation, with 2,887 cancers detected in this cohort. A reminder letter was sent to 370,208 who did not attend for screening after the first invitation and a further 245,157 (66.2%) women attended. The reminder letter increased the uptake of the sample by 29.9% to 84.7% for the ten year period (694,131 (84.7%) and cancers detected by 1,550 (35%). Women awaiting a reminder were less likely recalled for assessment 9,555 (3.9%) than respondents to first invitation 2,887 (4.04%) (p=0.004). Younger, mainly initial women were more likely recalled for assessment after first invitation and after reminder; comparison by age group and screening phase with outcomes: uptake, recall rate, cancer detection and true positive rates. There was no difference between cohorts for cancer detection rate or true positive rate. Reminder invitations increased uptake, supporting international evidence. For programme efficiency, attendance at first invitation is optimal. For maximum programme effectiveness, attendance must be encouraged with reminders.
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When examined by initial and subsequent women separately, there were no statistically significant differences between the two cohorts for recall rate, cancer detection rate or true positive rate. Recall rate was further analysed by age groups (<50, 50-54, 55-59, 60-64 and 65+), for all women combined and then by initial and subsequent women separately (Table 2). When attendees were examined overall, recall rates were significantly higher in those responding after first invite in 50-54 year age group; this was also found in the initial women subgroup. In the 55-59 year age group the pattern was reversed in initial women, with significantly higher recall rate in those attending only after reminder invitation. Similarly in the subsequent subgroup the recall rates were higher among responders to reminder invitation in the 60-64 year age group; recall rates in other age groups were similar. There were no statistically significant differences for cancer detection rate or true positive rate, when the data was examined by age for either initial or subsequent women.

Discussion

With an additional uptake of 29.9% and a further 1,550 (35%) cancers detected due to reminder letters, it is clear that reminders are both justified and cost efficient, strengthening the evidence of various international studies which show positive outcomes of reminder interventions for screening programmes. A Cochrane review of strategies for increasing the participation of women in breast cancer screening concluded that most active recruitment strategies examined were found to be more effective than no intervention, but that cheapest and simplest interventions such as letters and phone calls were best to consider in the first instance. A Canadian study which focussed on second invitations or reminder invitations found that reminder letters were considered by participants to be useful and seemed to influence women's decisions to be screened. This supports another study in the UK which recommended that all women should receive a second invitation, ideally with a timed appointment. This UK study also identified a group of women who required a simple reminder letter to ensure an increased uptake, allowing savings in appointment scheduling.

Cancer detection rates and true positive rates were found to be similar in those attending after first invitation and after a reminder overall and by initial or subsequent analysis. Reminder invitations resulted in the detection of 1,550 or 35% of all cancers detected in the sample over the ten year period. These findings reinforce the importance of reminder interventions, with similar percentages of cancers being detected by mammograms in women attending first appointment, as in those who wait for a reminder invitation. Any reduction in reminder letters would serve to seriously impact on cancer detection and mortality reduction.

When recall rate was examined, some interesting findings emerged. Initial and subsequent women (combined) who waited for a reminder invitation were less likely to be recalled for assessment than those attending screening after first invitation (3.90% vs. 4.04%). This is contrary to Norwegian findings where significantly more women who waited for a reminder invitation were recalled to assessment (4.0% vs. 3.5%). The increased recall rate for women attending their first appointment in Ireland could be explained by the fact that women who have underlying concerns or perceived risk of breast cancer are more likely to attend their first appointment than wait for a reminder letter. A meta-analytic review examining the relationship between breast cancer risk and mammography screening showed studies measuring perceived risk found that feeling vulnerable to breast cancer was positively related to having obtained a screening and studies that measured worry showed that great worry was related to higher screening levels. These underlying concerns are reflected in reality these women may be more likely to be recalled to assessment. The findings for subsequent women alone were more consistent with results from Norway in that more women who waited for a reminder were recalled to assessment, compared to those attending their first appointment but the differences were not significant.

This data suggests that of all women attending for screening in BreastCheck, younger women are more likely to be recalled for assessment if they attend screening after first invitation rather than wait for a reminder invitation. This finding stems from initial women who comprise the majority of women in this age group. However the pattern of recall by age group was inconsistent, with a reversal in older women, 55-59 years in initial and 60-64 years in subsequent; this likely reflects the increasing cancer detection rate with age combined with a longer screening interval in those only attending after a reminder. For programme efficiency, attendance at first invitation is optimal; however for maximum programme effectiveness, by increasing cancer detection and reducing mortality, women must continue to be encouraged with reminder letters to attend for screening if they have missed their first appointment.

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References


