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Research Article

Non-Attendance to Post-Radiotherapy Follow-Up in Breast Cancer: Efficacy of Mail and Telephone Reminders

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ABSTRACT

Background: To assess the efficacy of two reminder interventions in improving post-radiotherapy follow-up attendance rates of breast cancer patients.

Methods: Three periods of three months were assessed, a baseline period, an intervention period and a confirmation period. In the intervention period, a two-step reminder system was used. This system consisted of a mail reminder (IV1) that was sent to all patients three to four weeks prior to the post-radiotherapy follow-up visit, which was followed by up to two telephone calls (IV2) for all patients who did not attend this follow-up visit. During the confirmation period, IV2 was used exclusively to assess the maximal possible efficacy of the telephone reminder.

Results: The non-attendance rate of breast cancer patients was 18.1% (19/105) in the baseline period; this rate decreased to 13.1% in the intervention period (23/176; p=0.33) after IV1 and then decreased to 6.3% (11/176; p=0.03) after IV2. In the confirmation period, 24.4% (42/172) of breast cancer patients did not attend their post-radiotherapy follow-up visit; the non-attendance rate decreased significantly after (exclusive) IV2 from 24.4% (42/172) to 9.3% (16/172; p<0.001). Significance was observed for the first call but not for the second call in the chi-square test.

Conclusion: Telephone reminder is an effective tool for improving breast cancer patient adherence to the post-radiotherapy follow-up visit. In this study, the telephone reminder system was more effective than the mail reminder system.

Introduction

Breast cancer is a long-lasting illness as it presents various post-treatment issues pertaining to cancer and its related treatments, including short and long-term side effects, comorbidities, and emotional issues as well as the risk of cancer recurrence. Appropriate follow-up care is an important aspect of comprehensive care for breast cancer but also for prostate and other cancer survivors for improving patient outcomes, including reduced morbidity and improved quality of life [1-3]. Post-radiotherapy follow-up as an integral part of the follow-up care program is aimed at evaluating and managing late or long-term side effects of cancer treatment; notably, early diagnosis of late treatment sequelae is in the best interest of patients and healthcare systems because of its interaction with daily function and general (non-cancer) health [2].

Appropriate post-radiotherapy follow-up visits usually involve a physical examination of the patient at the treating radiotherapy institution; these occur at regular intervals, such as annually for a period of five years [4]. Patient appointment scheduling usually takes place each time in advance and is agreed upon as binding, but a number of patients miss their appointments. Missing appointments is a well-known generalized phenomenon in healthcare services but also an underestimated healthcare problem [5]. So even, colleagues in Germany estimate that missed appointments are a negligible problem in post-radiotherapy follow-up and occur in approximately 5-10% of patients. A possible reason for missing appointments is that responsibility for breast cancer-related follow-up care is usually shared and other specialists, especially gynaecologic oncologists, dominate this field and weigh in

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particularly on tumor risk (e.g., tumor recurrence) [2]. This topic is, on the other hand, the most important follow-up information for the patients themselves. We performed a sample survey to quantify the problem of non-attendance at post-radiotherapy follow-up appointments and to determine the effectiveness of two specific reminder interventions for breast cancer patients.

Materials and Methods

The appointment records of the post-radiotherapy follow-up outpatient clinic were analysed for a quarter year (three months) to determine how many breast cancer patients missed their agreed-upon follow-up dates. In the intervention period, two reminder interventions were performed as part of a test run for a newly developed patient questionnaire about late toxicities following breast cancer radiotherapy [6].

First, a written reminder of the agreed follow-up appointment (intervention 1, IV1) was integrated into a covering letter to above-mentioned patient's questionnaire project; this reminder was sent (as mail reminder) via traditional postal delivery about three to four weeks in advance. Second, a trained office employee contacted all patients with breast cancer, who had not attended their follow-up appointment, inviting them via telephone (intervention 2, IV2) to attend a spare appointment. If the patients missed their spare appointment, the same telephone reminder procedure was performed as a unique repetition ("second call"). The intervention period was performed in the 2nd quarter of the predetermined year; the baseline period was defined as the 2nd quarter of the previous year.

Assuming that the phone reminder is at least as effective as the mail reminder, only the phone reminder (intervention 2, IV2) was repeated in the confirmation period for all breast cancer patients, who missed their follow-up appointment. In this way, we were able to determine the maximal possible efficacy of IV2. To evaluate the effect of both individual calls, the two-tailed chi-square test for significance was performed. The confirmation period was performed in the quarter after the intervention period (i.e., the 3rd quarter of the predetermined year).

Results

In the intervention period, a total of 632 post-radiotherapy follow-up appointments were scheduled, and a total of 170/632 (26.9%) were missed; from these, a total of 23/176 (13.1%) breast cancer post-radiotherapy follow-up appointments were missed. During the baseline period, a total of 480 post-radiotherapy follow-up appointments were scheduled, and a total of 119/480 (24.8%) were missed; from these, a total of 19/105 (18.1%) breast cancer appointments were missed (Table 1). Intervention IV1 was performed before a breast cancer patient possibly missed her radio-oncologic follow-up appointment. So, the difference in the non-attendance rate between the intervention and the baseline period for breast cancer patients was equated to the success of intervention IV1. The absolute difference in the non-attendance rate was 5.0%, and the relative lowering rate was 27.6% (p=0.33).

Table 1: Non-participation rates of breast cancer sub-group.

Evaluation period	**Breast cancer sub-group**
Baseline period - 1st month	5/40 (12.5%)
Baseline period - 2nd month	3/34 (8.8%)
Baseline period - 3rd month	11/31 (35.5%)
Sum baseline period	**19/105 (18.1%)**
Intervention period - 1st month	8/52 (15.4%)
Intervention period - 2nd month	11/61 (18.0%)
Intervention period - 3rd month	4/63 (6.4%)
Sum intervention period	**23/176 (13.1%)***
Confirmation period - 1st month	8/47 (17.0%)
Confirmation period - 2nd month	15/60 (25.0%)
Confirmation period - 3rd month	19/65 (29.2%)
Sum confirmation period	**42/172 (24.4%)**

*influenced by the preceding mail reminder (intervention 1)!

Table 2: Response rate to the intervention IV2 as a function of the number of phone calls in the intervention period. Final non-attendance = final failure of IV2.

Breast cancer patients	**Result: successfully rescheduled**	**Result: not successfully rescheduled**	**Result: final non-attendance**
First call (N=23)	9/23	8/23	6/23
Second call (N=8)	3/8	1/8	4/8
Sum	**12/23 (52.2%)**	**[1/23 (4.3%)]**	**10/23 (43.5%)**

Table 3: Response rate to the intervention IV2 as a function of the number of phone calls in the confirmation period. Final non-attendance = final failure of IV2.

Breast cancer patients	**Result: successfully rescheduled**	**Result: not successfully rescheduled**	**Result: final non-attendance**
First call (N=42)	22/42	9/42	11/42
Second call (N=9)	4/9	2/9	3/9
Sum	**26/42 (61.9%)**	**[2/42 (4.8%)]**	**14/42 (33.3%)**

With intervention IV2, the breast cancer patient non-attendance rate decreased in the intervention period to 6.3% (11/176), corresponding to a (further) absolute lowering rate of 6.8% and a relative lowering rate of 37.6% (p=0.03). Compared to the initial baseline value, the breast cancer patient non-attendance rate diminished from 18.1% to 6.3% for both interventions. This corresponds to an absolute lowering rate of 11.8% and a relative lowering rate of 65.2% (Tables 1 & 2). In the confirmation period, IV2 was repeated exclusively in all breast cancer patients. In this

period, a total of 566 post-radiotherapy follow-up appointments were scheduled, and a total of 156/566 (27.6%) were missed; from these, a total of 42/172 (24.4%) breast cancer post-radiotherapy follow-up appointments were missed. Via IV2, the breast cancer patient non-attendance rate decreased in the confirmation period from 24.4-9.3% (16/172). This corresponds to an absolute lowering rate of 15.1% and a relative lowering rate of 61.9% (Tables 1 & 3).

The results of IV2 expressed as a function of the number of phone calls in the intervention period are shown in (Table 2), and those for the confirmation period are shown in (Table 3). After the first call of the intervention period, 9/23 patients were rescheduled and 14 were not; after the second call made to 8 patients, 3 more patients were rescheduled and 5 were not. Totally, after the 2nd call, 11/23 patients missed follow-up visits (Tables 2 & 4). After the first call of the confirmation period, 22/42 patients were rescheduled and 20 were not. After the second call made to 9 patients, 4 more patients were rescheduled and 5 were not. Totally, after the 2nd call 16/42 patients missed follow-up visits (Tables 3 & 5). The two-tailed chi-square test revealed a significant difference in the number of missed appointments after the first call in the confirmation period (p=0.02; Tables 4 & 5).

Table 4: Two-tailed chi-square significance test evaluating the response rate to the intervention IV2 as a function of the number of phone calls in the intervention period.

Breast cancer patients	**Initial value**	**Result: not successful**	**p-value**
First call (N=23)	23/176	14/176	p=0.12 (not significant)
Second call (N=8)	8/23	5/23	p=0.33 (not significant)

Table 5: Two-tailed chi-square significance test evaluating the response rate to the intervention IV2 as a function of the number of phone calls in the confirmation period.

Breast cancer patients	**Initial value**	**Result: not successful**	**p-value**
First call (N=42)	42/172	20/172	p=0.02 (significant)
Second call (N=9)	9/42	5/42	p=0.24 (not significant)

Discussion

Missed healthcare appointments are a major source of potentially avoidable cost and resource inefficiencies impacting patient health and treatment outcomes. In the UK, it was reported that approximately 1.5 million of the 15 million appointments offered at consultant-led clinics between October and December 2012 were missed. Moreover, several studies have indicated that non-attendance rates at physiotherapy clinics are frequently between 6 and 30% and may be as high as 46% for some services [2]. To date, there are no valid data on this topic for oncology and radiotherapy patients. Experts in Germany estimate that the problem of non-attendance in post-radiotherapy follow-up involves approximately 5-10% of patients.

In our analysis, we found a cumulative non-attendance rate of 24.8% in the baseline period, 26.9% in the intervention period, and 27.6% in the confirmation period. In breast cancer patients, the non-attendance rates were lower in the baseline and in the confirmation period at 18.1% and 24.4%, respectively. Note that there is no true initial value in the intervention period because of intervention 1 (i.e. mail reminder). However, a non-attendance rate of about 20% is unacceptable. Stubbs and Mc Lean demonstrated in systematic reviews that reminder techniques are needed to improve appointment adherence [2, 7].

Two interventions were implemented in our sample survey, a mail reminder (IV1) that was sent to all patients three to four weeks prior to radio-oncological follow-up in the intervention period and a telephone reminder (IV2) for all breast cancer patients, who missed their radio-oncologic follow-up appointments. Both interventions were assigned to the "reminder plus" category, which is similar to that described by Mc Lean and means that the reminder provides additional information beyond the date, time and location of the appointment [7]. With our mail reminder (IV1), we achieved a missed appointment reduction of 27.6%. This result must be interpreted with caution because the comparative non-attendance rate of the baseline period consisted of only a three-month period, and the variable number of patients per quarter may have influenced the results. Additionally, the mail reminder (IV1) procedure was combined with a patient cover letter as a test run for a newly developed patient questionnaire. It is also conceivable that combining a patient questionnaire with our "reminder plus" intervention further improved the response rate in our sample survey.

Additionally, we achieved a decrease of 37.6% in the non-attendance rate in the intervention period by using a telephone reminder (IV2). A trained office employee performed the telephone reminder, providing the patient with additional information about the necessity of post-radiotherapy follow-up examinations. The combination of both reminder types (i.e., IV1 and IV2) lowered the non-attendance rate by an average of 65.2% in the breast cancer group; finally, only 11 of 176 patients (6.3%) with breast cancer missed the follow-up examination. This is an excellent intervention result and a very good foundation for the initiation of the patient-reported outcome (PRO)-questionnaire, as mentioned above. Intervention 2 (i.e., telephone reminder) was repeated in the confirmation period to determine the efficacy of IV2 as an exclusive intervention and to confirm our results. Interestingly, the non-attendance rate dropped by 61.9%, such that only 16 of 172 breast cancer patients (9.3%) missed follow-up examinations in this period. This result was statistically significant.

Our telephone reminder, as an exclusive measure, resulted in a comparably high reduction in the non-attendance rate relative to the combination of both interventions (i.e., IV 1 and IV2) in breast cancer patients. This implies that breast cancer patients from the test group would likely have agreed on an appropriate appointment after a telephone reminder alone, as shown in the confirmation period. Mc Lean postulates that "reminder plus" interventions may be more effective than simple reminders [7]. For example, Can *et al.*, investigated a different type of "reminder plus" intervention in a randomized controlled trial, requesting that patients return a stamped addressed postcard to confirm their appointments [8]. The action of returning the postcard may be

construed as a symbolic 'contract' between patient and provider, reducing the subsequent likelihood of non-attendance.

For whatever reason, patients who returned the postcard had a high attendance rate of 83% compared with only 48% if the card was not returned [8]. This represents a respectable decrease in the non-attendance rate of 57.8%. However, given that only a small number of studies have systematically investigated the hypothesis that "reminder plus" interventions may be more effective than simple reminders, the results are not conclusive. To date, there is no evidence demonstrating that receiving additional information as part of the reminder shapes patient perceptions and understanding of the importance of keeping appointments. As a result, further research is required to investigate these topics [6, 9].

We also found that the response rate to the second call was not significant according to the chi-square test but the additional effort for the second call was limited because only n=8/23* and 9/42 patients in the intervention and confirmation periods required a second call, respectively. Finally, 23*+8=31*/176 and 42+9=51/172 calls were needed to reduce outpatient non-attendance in the intervention and in the confirmation period, respectively. (*Note that there is no true initial value for the intervention period because of intervention 1). The high number of patients, who miss aftercare appointments, is a barrier to the delivery of continuous aftercare, compromising outcome quality as patients miss information about possible late toxicities [9]. Otherwise, these patients can suffer health disadvantages if late radio-oncologic toxicities are not treated in time. A parallel may be drawn with the problem of missed appointments at diabetes clinics, as reported by Griffin [10].

However, appointment attendance is part of the right to self-determination, and civil rights and liberties restrictions are justified only in special cases, such as in dangerous infectious diseases like the coronavirus disease (COVID-19) [11, 12]. This type of regulation would be unthinkable for addressing the majority of healthcare issues. As a result, reminder techniques such as those described here are adequate and effective countermeasures. For the remaining patients, who did not attend (accept) the conventional radio-oncological aftercare, alternate procedures could be offered to further improve radio-oncologic aftercare. The recent advances in telemedicine and health ICT provide wide prospects in communication between healthcare providers and cancer patients, including e.g. email, SMS, and automated phone calls, so that studies assessing their efficacy in various fields of human medicine (including oncology) are of great importance.

Conclusion

In summary, telephone reminders are feasible and effective for radio-oncological aftercare in breast cancer patients and can help considerably to optimize post-radiotherapy follow-up procedure as part of the follow-up care program. In particular, telephone reminders seem to be sufficient for patients who miss follow-up appointments.

Conflicts of Interest

None.

Ethics Approval and Informed Consent

The study on humans described in the present manuscript, which is about the structured demand with patient questionnaire for breast cancer patients, was performed with the approval of the appropriate local ethics committee from the Hannover Medical School. This article does not contain any studies with human subjects. The research described in the present manuscript was in accordance with both national law and the Helsinki Declaration of 1975 (including its most recently amended version).

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