ORIGINAL ARTICLE

DELAYS IN BREAST CANCER DIAGNOSIS AT A TERTIARY CARE FACILITY IN KARACHI, PAKISTAN

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Background: Diagnostic delay of breast cancer is linked to poor prognosis and survival. It can be caused by patients or healthcare providers. Since there is no quantification of provider delay and total delay in Pakistan, the general picture of breast cancer diagnostic delay is poorly understood. This study was conducted to quantify total delay, provider delay, and patient delay, along with the factors contributing to each type of delay in breast cancer management. **Methods:** This was a descriptive study conducted over 3 years at a hospital in Karachi. Convenience sampling was used. Breast cancer patients undergoing treatment were interviewed. Values for diagnostic delays extracted from literature were >12 weeks in seeking care as patient delay and >4 weeks in treatment initiation as provider delay. **Result:** A total of 334 patients were included in the analysis. Mean total delay was 56±52 weeks, the median (IQR) patient delay was 4 (0–22) weeks, and the median provider delay was 17 (9–52) weeks. Patient delay was found in 149 (44.6%), and provider delay was found in 269 (80.5%) patients. Believing symptoms to resolve on their own was the most common reason (24.9%) for patient delay. Seeking multiple opinions (43.7%) and misdiagnosis (43.4%) were the most common reasons for provider delay. **Conclusion:** Patients and providers both caused diagnostic delay in breast cancer treatment. There is a need to increase awareness in the general population and enhance the training of providers regarding timely recognition in all patients presenting with breast-related symptoms.

Keywords: Breast neoplasms; Delayed diagnosis; Missed diagnosis; Patient delay; Provider delay

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INTRODUCTION

Globally, breast cancer is the most common cancer in women and the leading cause of cancer-related deaths in women.[1] In Pakistan, the incidence of breast cancer during reproductive ages is highest in the region, with Karachi reporting the highest incidence rate in all of Asia[2] after Israel. Data shows that in the US, 60% of the cases of breast cancer are diagnosed at stages zero and one[3] while in Karachi, the majority of the cases are diagnosed at stages two and three[4]. Earlier diagnosis is associated with better outcomes and a decrease in morbidity and mortality.[5]

Total diagnostic delay comprises the time from the discovery of symptoms by the patient until definitive treatment initiation and includes patient delay and provider delay.[6] Patient delay is the period between the discovery of the first symptom and the first visit to the doctor for consultation. Any delay of more than 12 weeks, measured from the onset of the patient's symptoms, ushers a poor prognosis.[7,8] Provider delay compromises the time from the first contact with a healthcare provider to the final diagnosis and treatment initiation. The provider delay is usually considered to be more than four weeks.[8] Erroneous diagnoses due to false-negative mammograms, biopsies, and misinterpretation of symptoms are known causes of provider delay.[5,9]

Although the diagnostic delay of breast cancer in Pakistan has been recognized in some studies[10–12], none has quantified the provider delay. Due to a recognized association between delay and prognosis of the patient, the high incidence and stage at diagnosis of breast cancer in Karachi, this study was conducted to evaluate the magnitude of delayed diagnosis in breast cancer patients in Karachi and discover the contributing factors that lead to delay.

MATERIAL AND METHODS

This study was conducted between January 2016 and July 2019 at a public tertiary care hospital called Jinnah Postgraduate Medical Center in Karachi, Pakistan. The sample size was estimated using Open Epi for descriptive study with a high prevalence of the disease, 95% CI, and infinite population correction as 380. A convenient sampling technique was used to approach patients arriving for follow-up and treatment of malignant breast carcinoma of any histological type. Only patients with available treatment records were included, and a total of 347

patients agreed to participate after informed consent. The data was collected using a detailed structured questionnaire developed from a thorough literature search, which was contextualized to local conditions and adjusted for sensitivity after piloting. Information was collected on background demographics, initial symptoms, estimated delays, reported reasons for the delay, and corroborated from available patient record files. All interviews were conducted by the researchers themselves. Data were analyzed using SPSS version 21.0.

RESULTS

A total of 347 breast cancer patients participated in the study, and n=334 were included in the analysis. The mean age of patients was 47±12 years. 91% (n=304) patients were married, 83% (n=279) were housewives, 32.6% (n=109) had no formal schooling, and 70% (n=234) reported a family income of <20,000 PKR /month. A family history of breast cancer was present in 25.7% (n=86) women. The mean total delay was 56±52 weeks, the median (IQR which is interquartile range also known as the midspread or middle 50%) patient delay was 4 (0–22) weeks, and the median provider delay was 17 (9-52) weeks. Patient delay was found in 44.6% (n=149) and provider delay was found in 80.5% (n=269) patients. Table 1 shows the estimated delays in weeks as reported by patients. Almost half of the patients encountered both types of delays, but the majority faced provider delay. Cross tabulation and chi-square test determined significant association (p value<0.005) of a higher level of education and family history of breast cancer with a patient delay of fewer than 12 weeks. Almost all patients, 98.8% (n=330), self-discovered the symptoms as opposed to any screening process. Breast lump was the most common initial symptom and was present in 90.4% (n=302) of the patients. Table-2 shows the reasons cited by patients for the patient delay. The assumption that symptoms will resolve on their own was the most common reason for such delay.

Table-3 shows the reasons for provider delay. Misdiagnosis was the most common reason for such delay. Table-4 shows the approximate delays as reported by the patients and the stage at diagnosis, as reported by the records. Most patients were diagnosed at stages two and three.

Table-1: Diagnostics delays experienced by patients reported as means and medians

Delay Type	Number of patients % (n=)	Mean±SD	Median (IQR)
Patient Delay			
≤12 weeks	55.4 (185)	2±2.7	0 (0-4)
>12 weeks	44.6 (149)	46.9±46	26(17-54)
Provider Delay			
≤ 4 Weeks	19.5 (65)	2.2±2	4(0-4)
>4 Weeks	80.5 (269)	41.6±45	22(13-56)
Total Delay	100 (334)	56±52	39(17-82)

Table-2: Reasons identified by patients for delay in seeking care

Stated Reason	Patient Delay		No. of responses % (n)
	≤12 weeks	>12 Weeks	
Believed symptom will resolve itself	9	74	24.9 (83)
Home Responsibilities	3	56	17.7 (59)
Fear/embarrassment	1	16	5.1 (17)
Confusion	1	23	7.2 (24)
Carelessness by the patient	4	49	15.9 (53)
Financial Constraints	3	35	11.4 (38)
Preference for Alternative healer	5	10	4.2 (15)
Unaware where to seek care	2	32	10.2 (34)
Trouble finding a female physician	0	3	0.9 (3)
Worried about long appointments	0	10	3.0 (10)
Health facility distance is long	1	17	5.4 (18)
Distrust of doctors	1	1	0.6 (2)

Table-3: Reasons for provider delay

Stated Reason	Provider Delay		
	≤4 weeks	>4 Weeks	% (n=)
Mammography inconsistent with malignancy	1	25	8.2 (26)
Biopsy inconsistent with malignancy	1	13	4.4 (14)
Patient sought multiple physicians' advice	17	146	51.3 (163)
First physician's diagnosis was inconsistent with malignancy	53	145	33.2 (198)
Patient was prescribed Acetaminophen/antibiotics for malignancy	19	82	31.8 (101)
Appointments were cancelled before diagnosis was made	7	58	20.4 (65)
Follow-up was not always given before diagnosis	3	27	9.4 (30)

Table-4: Stage of breast cancer and corresponding delays

Stage of Breast cancer	Patient delay % (n)		Provider Delay % (n)	
	≤12weeks	>12 weeks	≤4 weeks	>4 weeks
0/1	5.1 (14)	4.8 (13)	2.2 (6)	7.7 (21)
2	34.8 (95)	22.3 (61)	12.5 (34)	44.7 (122)
3	10.3 (28)	14.3 (39)	3.3 (9)	21.2 (58)
4	4.8 (13)	3.7 (10)	0 (0)	8.4 (23)

DISCUSSION

This study shows that patient and provider delay are both present in breast cancer diagnosis in Pakistan. Patient delay is an essential contributor to diagnostic delays in developing countries.[11,13–15] According to many studies, delays of less than 12 weeks are linked to a favorable prognosis.[7,8] The mean patient delay in our investigation was 46.9±46 weeks. This delay value is higher than other studies conducted in Pakistan, which showed patient delay ranging from seven to eight months.[10,16] It was also higher in comparison with studies conducted abroad where average patient delay ranged from 10 days to 5months.[17–20] The most frequent reason for the patient delay in our study was the patient's perception that symptoms will self-resolve. Similar harmless perception of symptoms as a reason for the patient delay was also reported in multiple studies conducted in both Pakistan and other developing nations.[11,12,15,20,21] This can be attributed to a general lack of awareness regarding the symptoms, incidence, and severity of the disease within the local populations of low-income countries. The patient's role as a caretaker of family members is another reason similar to other studies conducted in Pakistan.[11,15] Breast lump was the most frequently reported symptom in our study, which was consistent with many other studies.[5,12]

In this study, the mean provider delay was 41.6±45 weeks, with a median of 22 weeks. This duration was higher when compared to other studies where delays ranged from three to four months.[17,19,22] The leading causes of provider delay listed in multiple studies were false-negative mammograms, biopsies, misinterpreting of symptoms, and misdiagnosing a malignant mass as benign without doing a biopsy.[5,9] The most frequent reasons found in our study for provider delay were patients seeking multiple medical opinions and misdiagnoses of symptoms as nonmalignant by physicians who prescribed incorrect medications. A reason for these findings could be that due to unsatisfactory consultation, the tendency of patients to seek multiple opinions increases. This, in turn, causes provider delay because of the lack of interconnected medical record systems in Pakistan. Falling through the health system cracks can have a significant impact on breast cancer management in terms of prognosis and the cost of care. Since a quarter of our patients had a family history of breast cancer, the inability to screen for breast cancer in this high-risk group and recommending immediate first-line investigations is a major weakness at the primary healthcare level.

The cancer stage is the most important factor determining the outcome and survival of patients.[23] In our study, the majority of the patients presented at stages two, followed by stage three, as was found in a previous study[4]. While some studies showed an association between prolonged delay and advanced cancer stage at diagnosis resulting in poorer survival rates, more recent ones have shown mixed results.[6] The prolonged total diagnostic delay and stage at presentation in our study can be explained by the fact that breast cancers have various sub-types, growth rates, clinical progression, and metastatic behavior. They are indolent and slow-growing in some, whereas aggressive and rapidly growing in others. This makes the aggressive ones present at an advanced stage in a comparatively shorter amount of time. Physicians are also more likely to characterize them as malignant. On the other hand, the slow-growing tumors may not appear malignant and may, therefore, be taken lightly while they progress silently. Since the responses in this study were recorded as reported by the patient and corroborated with the available information in the patient files, results must be considered within the limits of recall, personal, and survivor biases.

Self-discovery of symptoms was the main method of detection of breast cancer. This can be due to the lack of widespread population-based screening and the absence of routine health checkups.

Despite considerable activities carried out around World Breast Cancer Day, the delay in presentation requires targeted awareness programs. The focus of awareness campaigns should be the training of healthcare workers across the country to not only educate their patients about the high incidence of breast cancer but also to recognize the signs and symptoms of breast cancer themselves properly. Campaigns should be conducted at both private and government levels, teaching patients about the benefits of early detection. Regular screening programs should also be initiated. Guidelines should be established for physicians to correctly identify the symptoms, investigate appropriately, and promptly refer diagnosed patients to a specialist so that treatment can commence immediately. Continuity of care should also be encouraged via proper appointment systems and counseling.

CONCLUSION

A substantial number of our patients presented with patient delay (more than 12 weeks) and provider delay (more than four weeks). There were significant delays in both types. The most frequent reason for the patient delay was perceiving symptoms as self-resolving. The most common reasons for provider delay were patients seeking multiple opinions and misdiagnosis. The general population needs to be made aware of breast cancer symptoms and the effects of early diagnosis on prognosis via focused awareness campaigns. Health providers need training in the importance of effective first consultation, symptom recognition, and prompt primary investigations for breast cancer. A strong national medical record system and cancer registry are required to identify issues and streamline case management adequately. Further studies with the longitudinal design are required to confirm our findings and reduce the associated morbidity and mortality associated with a delay in breast cancer treatment.

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AUTHORS' CONTRIBUTION

MH: Literature search, conceptualization of study design, data collection, analysis and interpretation, write up and proof reading. ZH: Literature search, conceptualization of study design, data analysis and interpretation, write up and proof reading. MAA: Data analysis and write up. ZT, FS, WA: Data collection.

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