Original Research

Post mastectomy pain syndrome: a hidden facet among patients following mastectomy in the National Cancer Institute Maharagama, Sri Lanka

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Abstract

Background: Breast cancer is the commonest carcinoma among females in Sri Lanka, for which the majority are offered mastectomy as first line treatment. However, mastectomy itself may cause many complications including post mastectomy pain syndrome (PMPS).

Objective: To determine the prevalence of PMPS among patients who had underwent mastectomy and are being followed up at the National Cancer Institute Maharagama (NCIM), Sri Lanka

Methods: A descriptive cross-sectional study was conducted among female patients who had undergone mastectomy and attending the post-surgical clinics at NCIM. A convenience sample of 360 participants was recruited. An interviewer-administered questionnaire was used to ascertain socio-demographic characteristics, pain characteristics and impact of the pain on life. Chi-squared test was used to find associations of categorical variables. Multivariate analysis was used to identify the factors significantly associated with PMPS.

Results: Mean age of the study sample was 54.5 years (SD=9.9) and the majority (65.5%) were above 50 years. The prevalence of PMPS was 27.5 % (95% CI=22.9, 32.1) among the study population. PMPS was common among patients who had surgery within 18 months of diagnosis ($p<0.014$). After adjusting for confounders, the prevalence of PMPS was significantly higher among young patients (50 years or less) ($p<0.001$) and among patients who underwent axillary clearance ($p<0.001$). Of these, the highest contribution to PMPS was younger age.

Conclusions: More than one fourth of the mastectomy patients were suffering from PMPS. Patients of younger age and those undergoing axillary clearance were more likely to suffer from PMPS. Measures need to be taken early in the treatment to identify and manage PMPS.

Key words: breast cancer, mastectomy, post mastectomy pain syndrome

Introduction

Breast cancer is the commonest cancer among females in Sri Lanka (1). According to the published data, there were 8970 new cancer cases reported in 2010. More than one quarter (n=2401, 26.7%) of these cases were breast cancer patients (2). The National Cancer Institute Maharagama (NCIM), Sri Lanka renamed as Apeksha Hospital is pioneering cancer related service provision in the government health sector. According to the NCIM statistics, there were 1321 new breast cancer patients registered in 2009 (3). Mastectomy is the major treatment option offered to breast cancer patients. Following the mastectomy, patients are followed up at both oncology and onco-surgical clinics where most of the post-surgical complications are addressed. Post mastectomy pain syndrome (PMPS) is a specific complication developed by the patients who undergo mastectomy (4-5). However, there is no current data available on PMPS in the local context. Hence, the objective of this study was to determine the prevalence of PMPS among patients who underwent mastectomy and are being followed up at clinics at NCIM, Sri Lanka.

Methods

A hospital-based cross-sectional study was conducted among female patients who had undergone mastectomy three months before the data collection and were attending the oncology and onco-surgical clinics at NCIM. We excluded the patients diagnosed to have psychiatric diseases and metastasis. Sample size for the study was calculated as 360 to detect an expected prevalence of PMPS of 30% (6), with 95% confidence interval, 5% precision (7) and 10% non-response rate. The eligible and consenting patients were recruited consecutively from the clinics.

An interviewer-administered questionnaire was used to ascertain socio-demographic characteristics, PMPS, perceived pain, site of pain, impact of the pain on life and type of surgery. PMPS was defined as 'perceived' pain of the patient following at least three months after mastectomy over surgical scar, anterior chest wall, ipsilateral arm and ipsilateral shoulder in the nature of aching, burning, shooting and throbbing (4-5). Diagnosis of PMPS was made by two anesthetists who were experienced in pain assessment but not directly involved with the care of the participants. The severity of pain was assessed using a numerical pain scale (8). Zero in the scale indicated 'no pain' while 10 was the 'most severe pain'. Further categorization was done; scores 1-3 considered as 'mild pain'; scores 4-7 as 'moderate pain'; and scores more than 7 as 'severe pain'.

Chi-squared test was used to assess the significance of factors associated with PMPS. Multivariate analysis was used to identify most important factors associated with the PMPS. The dependent variable was PMPS, while the independent variables were those significant in the bivariate analysis. Informed written consent was obtained from each participant and privacy was maintained while collecting the data.

Results

Mean age of the sample was 54.48 years (SD=9.9). It ranged from 27 to 75 years. The prevalence of PMPS was 27.5% (95% CI=22.9, 32.1) among patients followed up at the clinics at NCIM. Most of the patients experienced an aching type of pain and almost similar proportions of patients (i.e. around 35%) felt pain over the chest wall and ipsilateral arm. According to the pain scale, more than half of the patients (52.5%) experienced moderate pain while only a small proportion (7.1%) experienced severe pain.

Table 1. Distribution of the characteristics of patients with post mastectomy pain syndrome (N=99)

Characteristic	No.	%
Type of the pain		
Aching	34	34.3
Burning	26	26.3
Shooting	19	19.2
Throbbing	20	20.2
Site of the pain		
Over the scar	18	18.2
Over the chest wall	34	34.3
Ipsilateral arm	35	35.4
Ipsilateral shoulder	12	12.1
Severity of the pain		
Mild pain	40	40.4
Moderate pain	52	52.5
Severe pain	7	7.1

The distribution of PMPS is shown in Table 1 in relation to the type, anatomical site and severity. Almost a quarter of PMPS positive patients stated that pain had an impact on their daily activities 'quite a lot or more', while 22.2% of patients said that PMPS affected them 'to some extent in their daily activities'. There were more than 60% who expressed 'dissatisfaction or little satisfaction' on pain management.

Among many socio-demographic characteristics, age was the only factor significantly associated with PMPS. Among PMPS positive patients, 62.6% belonged to age equal or less than 50 years (Table 2). Mean duration from the surgery was 16.4 (SD=23.3) months. PMPS was significantly higher ($p<0.001$) among patients 18 months or less following surgery. Also, patients who underwent both mastectomy and axillary clearance had a significantly higher chance of developing PMPS ($p=0.01$) (Table 3).

Multivariate analysis showed that the factors determining PMPS after adjusting for confounders were younger age, duration less than 18 months from surgery and patients undergoing axillary clearance. Of these, age was the highest contributor (OR=4.95) (Table 4).

Table 2. Association of the social-demographic characteristics with PMPS (N=360)

Characteristic	PMPS, No. (%)		Total No. (%)	p value[1]
	Positive (n=99)	Positive (n=261)		
Age (in years)				
50 or less	62 (62.6)	62 (23.8)	124 (34.4)	**<0.001**
More than 50	37 (37.4)	199 (76.2)	236 (65.6)	
Ethnicity				
Sinhalese	76 (76.8)	223 (85.4)	299 (83.1)	**0.05**
Non-Sinhalese	23 (23.2)	38 (14.6)	61 (16.9)	
Religion				
Buddhist	65 (65.7)	186 (71.3)	251 (69.7)	0.31
Non-Buddhist	34 (34.3)	75 (28.7)	109 (30.3)	
Current marital status				
Married	90 (90.9)	226 (86.6)	316 (87.8)	0.26
Unmarried	9 (9.1)	35 (13.4)	44 (12.2)	
Number of children				
No children	15 (15.2)	35 (13.4)	310 (86.1)	0.67
Had children	84 (84.8)	226 (86.6)	50 (13.9)	
Level of education[2]				
≤ GCE Ordinary Level	64 (64.6)	178 (68.2)	242 (67.2)	0.52
Above GCE Ordinary Level	35 (35.4)	83 (31.8)	118 (32.8)	
Employment status				
Currently employed	24 (24.2)	50 (19.2)	74 (20.6)	0.29
Currently unemployed	75 (75.8)	211 (80.8)	286 (79.4)	
Monthly income (Rs.)				
≤ 20,000	79 (79.8)	195 (74.7)	274 (76.1)	0.31
> 20,000	20 (20.2)	66 (25.3)	86 (23.9)	
Concurrent diseases				
Present	40 (40.4)	129 (49.4)	169 (46.9)	0.13
Absent	59 (59.6)	132 (50.6)	191 (53.1)	

[1]Bold lettering indicates significant associations at 5% significance level. [2]General Certificate of Education Ordinary Level

Table 3. Association of the duration and type of surgery with PMPS (N=360)

Characteristic	PMPS, No. (%)		Total No. (%)	p value [1]
	Positive (n=99)	Positive (n=261)		
Duration from the surgery				
≤ 18 months	92 (92.9)	197 (75.5)	289 (80.3)	**<0.001**
> 18 months	7 (7.1)	64 (24.5)	71 (19.7)	
Type of the surgery				
Mastectomy only	7 (7.1)	45 (17.2)	52 (14.4)	**0.01**
With axillary clearance	92 (92.9)	216 (82.8)	308 (85.6)	

[1]Bold lettering indicates significant associations at 5% significance level.

Table 4. Multivariate analysis to determine the most important factor associated with PMPS (N=360)

Characteristic	Odds Ratio[1]	95% CI[1]		p value
		Lower limit	Upper limit	
Age: ≤ 50	4.95	2.98	8.24	**< 0.001**
Duration from the surgery: ≤ 18 months	3.46	1.47	8.11	**0.004**
Type of the surgery: with axillary clearance	2.72	1.12	6.57	**0.03**

[1]Odds ratio calculated compared to the reference category; significant associations given in bold letters

Discussion

In the present study, 99 out of the 360 patients met the diagnostic criteria of PMPS, giving a prevalence of 27.5% among breast cancer survivors following mastectomy in Sri Lanka. According to the available studies, the prevalence of PMPS appears to vary considerably. However, an almost similar prevalence of PMPS to the present study (27.6%) had been reported in China (4), which used the McGill Pain Questionnaire to assess the pain and it characteristics. In USA, Stevens et al. (1995) reported a comparatively lower prevalence (20%) of PMPS in their study (9), while another study conducted in Aberdeen, Scotland found that as high as 29% of their patients had symptoms of PMPS (10). A study conducted in Odense University reported that 23% of patients had developed PMPS (11). However, the American Cancer Society had stated that the prevalence of PMPS vary around 20-30% (6). The prevalence of PMPS in the present study was within the same range.

The severity of pain was assessed in the present study using a numerical pain scale. According to the results, 40% of the patients reported of mild pain whereas 52.5% and 7.1% reported of moderate and severe pain, respectively. In contrast, the study conducted by Vilholm et al. (2008) revealed that the majority of patients (80%) were having mild pain, while 16% were having moderate pain and only a small proportion (3.2%) having severe pain (11). However, it should be noted that pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage (12), which is highly subjective in nature.

Present study found that the prevalence PMPS was significantly higher among younger patients (age ≤ 50 years) than older group ($p<0.001$). This may be due to younger patients having a more aggressive disease condition owing to high oestrogen receptor levels resulting in more invasive surgery which in turn may cause more damage to the tissues (13). Further, younger women are more anxious and sensitive to pain which may have contributed to the high prevalence of PMPS.

Results of the present study also showed that patients within 18 months following surgery had a higher chance of developing PMPS than others ($p<0.001$). Intensity of PMPS usually diminishes over time while the patients are also able to develop adaptation to the condition along with physiological alteration of pain receptors over time (14). However, contradictory findings had been shown in a prospective cohort study, which followed up 113 patients and found that 52% of them had symptoms of PMPS even after six years following surgery (15).

The study noted that patients who underwent mastectomy with axillary clearance were having a higher chance of developing PMPS than patients who did not undergo axillary clearance ($p=0.01$). This can be explained by the pathophysiology of PMPS (16), in which more invasive axillary clearance causes more nerve damage including brachial plexus that innervates breast, arm and shoulder (17). This finding is comparable with the findings of many other international studies (18-19).

We selected consecutive patients who were willing to participate in the study. Hence, we did not apply a probability sampling method, thus limiting the representativeness of all post-mastectomy patients attending the clinics at NCIM.

Conclusions and Recommendations

The prevalence of PMPS among the post-mastectomy patients was 27.5% (95% CI=22.9, 32.1). The PMPS was significantly associated with age, the type of surgery (mastectomy with axillary clearance) and duration from surgery. After adjusting for confounders, the most significant factor that determines PMPS was age of patient. We suggest that health professionals in oncology and onco-surgical units should pay more attention to post-surgical management in order to identify and manage PMPS in order to improve the quality of life of post mastectomy patients.

Public health implications

Breast cancer is the commonest carcinoma among females in Sri Lanka while mastectomy is the major method of treatment. Though many global studies identify PMPS as a major complication following mastectomy, it has gained poor attention in the management. In addition, to that there is no data available on PMPS in local context. The present study provides evidence on PMPS in the Sri Lankan setting to be applied in clinical management by health care workers treating patients following mastectomy.

Author Declarations

Competing interests: Both authors do not have any conflict of interest.

Ethics approval and consent to participate: We obtained ethical approval from the Ethics Review Committee of the National Institute of Health Sciences Kalutara (Reference No: NIHS/ERC/16/19). Informed written consent was taken from all participants.

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Author contribution: Both authors participated in designing the study, data analysis and preparing the manuscript.

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