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ORIGINAL ARTICLE

Frequency and Risk Factors for Post Mastectomy Pain Syndrome [PMPS] in Female Breast Cancer patients

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ABSTRACT

Post mastectomy pain syndrome is one of the most common complications after axillary surgery for breast cancer. PMPS is considered a neuropathic pain and is thought to be caused by a variety of pre-operative, intraoperative and postoperative risk factors. In this study all post operative patients for breast cancer were interviewed at follow-up visits for symptoms of pain according to DN4 neuropathic pain score questionnaire and VAS scale for pain intensity. A total of 97 patients were included according to inclusion criteria. Among them 24(24.74%) patients were having PMPS and 73(77.06%) were having no PMPS. Among risk factors, ALND was found to be the most important risk factor for development of PMPS. In most patients the pain was mild in intensity according to VAS scale. And site of the pain was mostly found to be ipsilateral chest wall and axilla and majority of patients pin responded to simple NSAIDS and Arm exercises.

Keywords: Breast cancer, mastectomy, pain

INTRODUCTION

Pakistan has the highest rate of breast cancer in Asia, 2nd only to Ashkenazi Jews[2]. 90000 women are diagnosed with breast cancer every year.

Breast cancer is a systemic disease that requires multi-modality treatment regimes and surgery is an essential part to cure it[1]. With advancement in medical technology and better ways of management the number of survivors are increasing and so are the patients with PMPS

Breast cancer surgery is associated with many complications. One such complication is chronic pain the so called Post Mastectomy Pain Syndrome [PMPS][13]. By definition PMPS is chronic pain in chest, armpit, upper arm and shoulder lasting more than three months after surgery[4]. The term PMPS is used even for patients who have undergone breast conserving surgery despite its name including mastectomy only[8]. According to international association for the study of pain [IASP] PMPS is defined as persistent pain soon after breast cancer surgery affecting the anterior thorax, axilla, and/or medial upper arm[5]. It is commonly described as burning, tingling, feeling of numbness, pins and needles or heaviness[14]. It may occur in about 20-50% of patients and may last months to years and is difficult to treat[4,9,13].

PMPS is considered as neuropathic pain that may be caused by variety of risk factors which include the presence and intensity of post operative pain, damage to nerve fibers in axilla and chest wall, use of adjuvant therapies including chemotherapy, radiotherapy and hormonal therapy, type of surgery, individual susceptibility, previous history of other types of pain conditions and many others[6,7,10,11,12]. However the clear etiology and mechanism is not clear yet. The management of PMPS is complicated and no clear management guidelines have been found yet. Patients are usually advised NSAIDS, opiods, arm exercise and physiotherapy. Some patients are referred to pain clinic.

The purpose of this study is to find out the prevalence and risk factors for PMPS in our setup and identify better management options. It may help in preventing or at least reducing the chances of PMPS.

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METHODOLOGY

It was a retrospective cohort study consisted of post operative patients operated from 2016 to 2010 who presented to breast clinic of Combined Military Hospital Rawalpindi for follow up after permission from IRB. All female patients operated for breast cancer from 2016 to 2020 were interviewed at follow-up visits and were asked about pain symptoms. Only female patients with diagnosed cancer age 20-70 years were enrolled. Only operable cases were included. Diagnosis was confirmed by histopathology. Those complaining of pain with more than three months post op duration were included. Male patients and those with age<20 &>70 were excluded. Palliative mastectomies and patients undergoing reconstruction were excluded. Patients with recurrent breast cancer or those operated for bilateral cancers were also excluded. Those post op patients with pain duration less than three months were also excluded.

All operated patients were interviewed at follow-up visits in breast clinic and were asked about symptoms of pain. Those complaining of post op pain and fitting into inclusion criteria were enrolled and selected for study. Questionnaire proforma was filled including DN4 [doule urneuropathique 4] neuropathic pain variables given in Fig. 1. Pain intensity was score according to visual analog scale [VAS] shown in fig.1. The purpose of the study was

explained to all patients before enrolment. Those not willing to enrolled were excluded. Permission from the ethical committee of the hospital was taken before starting study.

RESULTS

A total of 97 patients operated for breast cancer from 2016 to 2020 were interviewed at follow up visits in breast clinic. 24(24.74%) patients, out of total 97 patients reported to have post mastectomy pain, while remaining 73(77.06%) did not reported any long term pain once the incision has healed. Patient characteristics are showed in table 1 and 2.

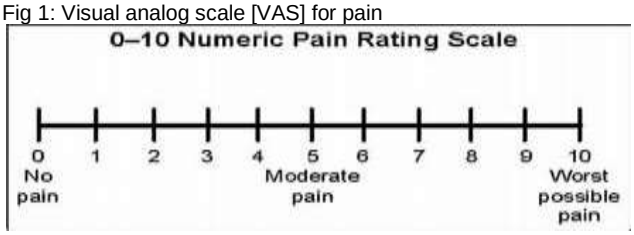
Table 1: Patients demographics (n=97)

Characteristic	Patients with pain (n=24)	Patients with no pain (n=73)
Age (yr)		
>50	16(66.66%)	43(58.90%)
<50	8(33.33%)	30(41.09%)
Stage		
Early (I/II)	6(25%)	57(78.08%)
Locally advance (III)	18(75%)	16(21.91%)
Surgery (breast)		
BCS	02(8.33%)	39(53.42%)
Mastectomy	22(91.66%)	34(46.57%)
Surgery (axilla)		
ALND	21(87.5%)	12(16.43%)
NO ALND	03(12.5%)	61(83.56%)
Chemotherapy		
Yes	22(91.66%)	56(76.71%)
No	2(8.33%)	17(23.28%)
Radiotherapy		
Yes	21(87.5%)	49(67.12%)
No	3(12.5%)	24(32.87%)
Lymphedema		
Yes	03(12.5%)	10(13.69%)
No	21(87.5%)	63(86.30%)
SSI		
Yes	02(8.33%)	04(5.47%)
No	24(91.66%)	69(94.52%)
Comorbids		
Yes	18(75%)	45(61.64%)
no	6(25%)	28(38.35%)
Chronic pain history		
Yes	03(12.5%)	9(12.32%)
No	21(87.5%)	64(87.67%)
Regular arm exercise		
Yes	9(37.5%)	41(56.16%)
No	15(62.5%)	32(43.83%)

Table 2: Pain characteristics of patients with PMPS (n=24)

Characteristic	n
Pain intensity on VAS scale	
Mild (0-3)	15(62.5%)
Moderate (4-6)	9(37.5%)
Severe (7-10)	0(0%)
Pain site	
Ipsilateral Chest wall+ Axilla	16(66.66%)
Ipsilateral Arm	5(10.83%)
Ipsilateral shoulder	3(12.50%)
Pain nature	
Constant	2(8.33%)
Intermittent	22(91.66%)
Pain duration	
<6 months	2(8.33%)
>6 months	22(91.66%)
Pain type (DN4 questionaire)	
Tingling + Burning + pricking+ itching	17(70.83%)
Pins/needles + Electric shock + numbness	7(29.16%)
Hypersensitivity/tenderness to touch	7(29.16%)
Hypoesthesia to touch	8(33.33%)
Response to pain killer	
Yes	17(70.83%)
No	7(29.16%)

Fig 1: Visual analog scale [VAS] for pain



DISCUSSION

After breast cancer surgery, about 50% of patients report post mastectomy chronic pain[31]. The pain ranges from mild to severe, but sensory abnormalities like paresthesias and phantom breast phenomena happens in about 47%[28]. The prevalence of PMPS varies considerably ranging 20-50% in different studies. The prevalence in our study was 24.74%. The possible reasons for this much variation is attributed to different factors including lack of standard definition of pain, subjective nature of pain feelings, neuropathic vs non neuropathic pain features, time duration after surgery to consider for PMPS, and different inclusions and exclusions criterias[16].

Studies including only classic neuropathic pain as defined from DN4 questionnaire and excluding all others musculskeletal pain found much lower prevalence of pain about 23.9%[22].Studies that also include pain due to lymphoedema and musceloskeletal pain with PMPS find much higher prevalence rates of 47% and 42% respectively[13,24,25,26,27,28]. The prevalence and intensity of PMPS diminish with time due to some adaptation mechanisms to bear the chronic nature of pain[16].

In our study, pain duration of more than three months with features of neuropathy according to DN4questionairewere considered as PMPS. In majority of patients the pain site was dominated by ipsilateral chest wall and axilla, followed by ipsilateral arm, followed by ipsilateral shoulder. Almost all of the patients reported their pain as intermittent in nature and very few reported the pain as being of constant nature. The duration of pain was found to be more than six months in majority of patients showing the chronic nature of pain.

The pain type was mostly found to be neuropathic with majority of patients reported their pain as a combination of tingling, burning, pricking and itching and less commonly as combination of numbness and electric shock like. Some patients also found hypoesthesia of operative skin area upon touching. The possible explanation may be injury to the cutaneous nerves of skin during incision. Other patients found increased sensitivity/tenderness of operative area skin to touch. This may be due to regeneration and growth/ healing of damaged cutaneous nerves.

Most of the patients found pain relief with simple pain killer like paracetamol and NSAIDS and very few patients whose pain was not controlled with oral NSAIDS were referred to pain clinic for nerve blocks

The etiology and mechanisms of PMPS is not clear yet. However a variety of risk factors have been associated with the development of PMPS. Among them, intraoperative nerve injury especially at axilla while performing ALND is considered the most important one[8,29,13,30]. During mastectomy, the occurrence of damage

in intercostals, axillary and intercostobrachial nerves and an inflammatory reaction at the surgical incision site lead to peripheral and central sensitisation in the sensorineural system followed by pain, hyperanalgesia and/or allodynia at the surgical incision site[7,8].

In our study ALND was strongly associated with the development of PMPS vs no ALND. Similarly our study also found that total mastectomy is another strong factor for the development of PMPS as compared to breast conservation surgery. Many studies have found severe early post operative pain and pre-existing pre-operative pain at surgical site as strong predictor of PMPS[17,18,19,20,21]. However in our study, no association of preexisting chronic pain was found with development of PMPS.

The mean age of patients interviewed was comparable with similar studies[32,33]. However, this study did not result in any statistically significant difference when it comes to the role of age in PMPS (p=0.47). Some studies have shown young age having a significant relationship with PMPS[32-34]. They argue that young age, pre-menopausal status, and aggressive forms of cancer have to undergo more invasive surgery and adjuvant therapy which might be the reason for PMPS. Young patients can also have anxiety and have a comparatively low threshold to sensory disturbances[32]. However, Carpenter et al[33] in his study did not find any association between age and PMPS which is same as our study.

Adjuvant cancer therapy has been reported to have a relationship with PMPS in many studies. It has been found that surgery induced injury is aggravated by radiation therapy[23].Gartner et al.[13] in his study on post mastectomy pain showed that radiation treatmenthas a significant association risk , but this is not related to the extent of the field of radiation and not related to severity as well. The same study also reported non independent relation of chemotherapy with pain. Cairns et al[32] stated that patients reporting PMPS were more likely to have received preoperative chemotherapy and postoperative radiotherapy and tamoxifen; however, there were no clear associations observed between pain and adjuvant therapy. Carpenter et al[33] found a high prevalence of PMPS (33%) among women who underwent lumpectomy with combination chemo-radiation therapy.

In this study, no statistically significant association existed between pain and chemotherapy (p=0.31), pain and radiotherapy (p=0.84), and pain and combination chemo-radiation therapy (p=0.79). Chemotherapy and radiation therapy are related to age and disease stage and can themselves be the cause of various neuropathic pain syndromes and it is thus uncertain whether they make an independent contribution to the development of PMPS[4].

The size of the tumour or stage, postoperative complications including surgical site infection (SSI) and lyphoedema, and comorbids are also considered as risk factors for development of PMPS[35,36,37].

CONCLUSION

Our study found that the prevalence of PMPS is significantly higher in those patients who have large tumour or advance stage (LABC). However our study did not found any statistically significant association of SSI, lyphoedema, comorbids or previous history of chronic pain with PMPS. However, lack of regular arm exercise was also found as statistically significant risk factor for the development of PMPS.

Conflict of interest: Nil

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