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Mastalgia in medical students: a prospective and multicentric study

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ABSTRACT

Introduction: Mastalgia or breast pain affects most women, especially those of reproductive age. Of organic or nonorganic cause and variable intensity, it is related to factors such as hormonal, dietary, metabolic, and emotional changes, making it difficult to understand its pathophysiology and the definition of care conduct. It can influence the quality of life. The aim of this study was to identify, classify, and know the treatments and their effectiveness for breast pain in university students, relating their interference in the quality of life. **Methods:** A total of 1,064 students from two medical schools in the interior of São Paulo were interviewed and evaluated using a standardized and specific questionnaire with the aim of characterizing breast pain. **Results:** Mastalgia was reported in 1,034 students (p=0.0003), body mass index >25 increased breast tenderness by 4.3 times (RR=4.3; p=0.001; 95%CI 2.5–6.73), and sedentary lifestyle increased by 10.82 times (p=0.02). It was more common in the premenstrual cycle (p=0.002), and the greater the intensity, the smaller the number of students who performed the self-examination (p=0.02). The greater the pain, the greater the chance of being absent from classes (RR=15.82; p=0.0003; 95%CI 13.23–17.3). Drug treatment was applied in 15.54% of the cases, with satisfactory results in 92.16% of them (p=0.000004). **Conclusions:** The study showed a high incidence of breast pain in medical students, impairing their academic activities, making it clear the importance of investigating any symptom related to the hormonal axis and showing significant efficiency of the pharmacological treatment.

KEYWORDS: mastalgia; quality of life; activity, daily living; pharmacologic therapy.

INTRODUCTION

Mastalgia, also known as mastodinia, is the term used to define pain in female or male breasts, which may be related to increased sensitivity or even breast engorgement[1,2]. Despite cyclic or non-cyclic mastalgia, it affects most women of reproductive age. When it is cyclic, i.e., associated with physiological processes and without an organic cause, it appears in the days before menstruation and disappears in the first days of the cycle. In the case of a non-cyclic character, the symptom is not related to the menstrual period[3].

Its classification is based on non-cyclic mastalgia, cyclic mastalgia, and extramammary pain. In the cyclic case, it usually affects both breasts, with more prevalence in the lateral and upper regions of the breasts, radiating or not to the upper limbs. It is usually associated with breast thickening, constituting the group of benign alterations related to the functional response of the organ. In this case, the pain usually decreases in the beginning of menstruation, which is the most common characteristic recorded in women aged 30–40 years, in a period close to premenopause. Acyclic pain, in turn, may result from specific breast disorders or anatomical changes resulting from conditions such as breast inflammation, previous trauma, fibrosis, neuralgia, joint pain, dermatitis, and phlebitis.

In this situation, it is more localized, unilateral, and continuous, generally affecting women aged between 30 and 50 years. The extramammary classification refers to pain originating from structures outside the anatomy of the female and male breasts, whether or not arising from the heart, lungs, and esophagus[1,4].

Although the rates of breast cancer associated with mastodinia range from 0.5% to 3.3%, this differential diagnosis should be discarded since, in general, consultation with a specialist is

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mainly due to concern about the suspicion of malignancy, a determining factor for suffering psychological condition of the affected women. Other differential diagnoses are inflammation of extramammary tissues, intercostal neuralgias, and chest pain related to cardiac conditions[2].

The intensity of breast pain is characterized as mild when it does not change the patient's daily life, moderate when it bothers them but does not change their daily habits, and intense when it interferes with their tasks and prompts to use medication frequently. Its prognosis tends to be favorable with spontaneous resolution of the condition between 3 months and 3 years[5].

Breast tenderness should be considered more as a symptom than a disease. It is, without a doubt, the most frequent complaint of patients in relation to the mammary glands and the most common cause of consultations in mastology outpatients. Although very frequent, the fact of not knowing well its pathophysiology, as well as where hormonal, dietary, metabolic, and emotional factors interact, has generated uncertainty as to the type of preferential care conduct to be offered to these women[6].

Its correlation with psychological disorders, such as anxiety and depression, should also be taken into account in terms of quality of life. Thus, its early identification and treatment deserve special attention[7].

Therefore, this study aims to identify the incidence of breast pain in university students, classify its intensity, survey the main treatments used and the response rates, and assess the degree of interference of this condition in the daily routine of these women.

METHODS

This is a prospective and observational study conducted in the period from 2010 to 2019, totaling 10 years of analysis. The research project was carried out jointly by two faculties of medicine in the interior of São Paulo and approved by the respective ethics committees, under the numbers PIC 149 and 35/08.

Medical students from both institutions answered a specific questionnaire with the aim of characterizing breast pain. Only academics who met the following criteria were selected: having menstruated at least once, 18 years of age or older, and who agreed to voluntarily answer the questionnaire, after providing detailed information and signing the free and informed consent form.

The evaluation was applied in the classrooms of the respective courses throughout the period foreseen for the study. The questionnaire contained 24 questions on various topics, such as anthropometry, gynecological background, use of prostheses, smoking, characteristics and treatment of pain, physical activity, and ingestion of xanthines (e.g., coffee, tea, or refrigerant), so that standardized responses allowed for agility and speed in data collection and subsequent analysis. For statistical analysis, the JMP 9.0.2 software was used.

RESULTS

A total of 1,064 university students were interviewed, 580 from one institution and 484 from another, aged between 17 and 70 years, with an average of 22 years. Age at menarche ranged from 8 to 17 years, with a mean of 12 years. The body mass index (BMI) of the sample ranged from 15 to 44, with a mean of 22.

Of the 1,064 students, 107 were already pregnant (10.05%), 44 (4.13%) used silicone breast implants, and 55.02% wore a medium-sized bra. It was found that the size of the breasts did not show a direct relationship with the clinical presence or absence of mastalgia. Users of combined oral contraceptives had less breast pain compared to the other participants.

As for the intensity of the pain, 1,034 students reported bilateral mastalgia, in the majority, and in the lateral quadrants of the breast (p=0.0003) (Table 1).

It was observed that overweight and obesity (BMI>25) increased the relative risk (RR) for mastalgia by 4.3 times, compared to patients with adequate BMI (RR=4.3; p=0.001; 95%CI 2.5–6.73). A sedentary lifestyle was related to mastalgia in 65.81% patients who were at 10.82 times higher risk when compared to those who practiced physical activity at least once a week (p=0.02) (Table 2).

Breast pain was more common in the premenstrual period (60.46%) compared to the postmenstrual period (p=0.002). The greater the intensity of breast pain, the lower the number of students who performed breast self-examination (p=0.02) (Table 3), and the more intense the pain, the greater the chance of being absent from classes (RR=15.82; p=0.0003; 95%CI 13.23–17.3) (Table 4).

Of the total evaluated, 15.54% used nonsteroidal anti-inflammatory drugs (NSAIDs) for less than 3 months, with satisfactory results in 92.16% of cases (p=0.000004) (Table 5).

Table 1. Mastalgia intensity and the relationship between the breasts.

Intensity	Laterality				Total	
	Bilateral		Unilateral			
	n (%)	n	n (%)	n	n	n (%)
Severe	69.46	439	80.06	277	716	73
Moderate	2.69	17	0.87	3	20	2
Weak	27.85	176	19.08	66	242	25
Total	100.00	632	100.00	346	978	100

DISCUSSION

Mastalgia is predominantly a female symptom, and only 15% of affected women will need some therapeutic modality. The evolution of breast pain is important to determine its relationship with a natural process, such as hormonal or pathological changes. Usually, breast tenderness is linked to benign pathologies; however, the search for specialized care results from the concern with serious diseases, for example, breast cancer, even though it is a rare symptom of this disease[1-3,6].

Breast pain, in turn, is considered common, and about 70% of Western women will experience it at some point during menacme[5,8]. A study involving 1,700 women with a mean age of 34 years showed that about 52% had breast tenderness, especially those of advanced age, while 41% reported problems related to sexual health and another 35% to sleep[9].

In general, the response of non-cyclic breast pain to drug treatment tends to be less positive than its cyclic form; however, its resolution tends to be spontaneous[2]. Cyclic breast pain

Table 2. Intensity of pain related to physical activity.

Intensity × Physical activity		Physical activity						Total	
		None		1 × per week		2 × per week			
		n (%)	n	n (%)	n	n (%)	n	n (%)	n
Pain	Severe	72.23	502	92.89	196	70.83	85	74	756
	Moderate	1.44	10	2.37	5	4.17	5	2	20
	Weak	26.33	183	17.54	37	25.00	30	24	250
Total		100.00	100.00	100.00	695	100.00	211	100.00	120

Table 3. Link between pain intensity and self-examination.

Pain Intensity	Self Exam					
	Yes		No		Total	
	N (%)	N	N (%)	N	N (%)	N
Severe	62.50	200	78.66	542	73.54	742
Moderate	1.56	5	2.18	15	1.98	20
Weak	29.69	95	22.06	152	24.48	247
Total	100.00	320	100.00	689	100.00	1009

RR: relative risk. RR 10.82; p=0.02; 95%CI 6.32–15.23.

Table 4. Link between absence in class and intensity of pain.

Intensity	Absence In Class					
	Yes		No		Grand total	
	n (%)	n	n (%)	n	n (%)	n
Severe	73.77	748	33.33	1	73.65	749
Moderate	1.87	19	33.33	1	1.97	20
Weak	24.36	247	33.33	1	24.39	248
Total	100.00	1.014	100.00	3	100.00	1.017

RR: relative risk. RR 15.82; p=0.0003; 95%CI 13.23–17.3.

Table 5. Link between treatment time and pain intensity.

Intensity	Treatment Time									
	None		1 month		2 months		3 months		Grand total	
	n (%)	n	n (%)	n	n (%)	n	n (%)	n	n (%)	n
Severe	76	623	65	114	33	4	40	2	75	756
Moderate	1	11	3	6	17	2	20	1	2	20
Weak	21	171	32	56	50	6	40	2	23	235
Total	100	818	100	176	100	12	100	5	100	1.011

corresponds to 66% of all women consulted and is related to hormonal variation during the menstrual period. It is usually bilateral and has a premenstrual character, being more frequently referred to in the upper lateral quadrant of the breasts[10]. The acyclic type, in contrast, corresponds to the remaining 34% and is not related to the menstrual cycle, assuming a constant or intermittent character and, generally, unilateral and with a variable location. According to some studies, the etiologies are related to the volume of the enlarged breast, responsible for the distention of Cooper's ligaments, the diet rich in lipids, the lifestyle (sedentary lifestyle and smoking), and the presence of breast microcysts, mastitis, and hidradenitis suppurativa, but there is no consensus on the main etiology involved[10,11].

Appropriate assessment and adequate exclusion of the possibility of malignancy already reduce about 78%–85% of complaints, as reported by some studies. For a group of 10%–22% of women who reported persistent breast pain, conservative measures would suffice. Breast cancer rarely presents breast pain as a single finding, and it is present in 0.5%–3.3% of the time. If present, it manifests as localized acyclic mastalgia with nodulation associated with the condition[2,8].

The search for organic diseases in the context of breast pain is indicated when there is evidence of failure in behavioral therapy, which consists of changing the lifestyle and the patient's understanding of the symptom. The workup should be performed using screening mammography and breast ultrasound, when indicated. With benign findings and the persistence of symptoms, therapy should be initiated[12,13].

Verbal guidance as a form of treatment for cyclic breast pain should always be the first recommended option, considering the vast array of possible therapies for these cases, including the prescription of several drugs that are often expensive, some of which have not always been proven to be effective and others with significant side effects[7,14].

Treatment should only be proposed after the evaluation of each case, always followed by verbal guidance, thus avoiding drug treatment as a first approach. Only for persistent and unresponsive cases would drug therapy be indicated. Several drugs have been proposed, including placebos, whose response can reach 19%[15].

Although other drugs can be used, the first choice, both in the case of cyclic and acyclic breast tenderness, should be considered for a minimum period of 6 months and include the use of a topical NSAID such as diclofenac. Studies show significant improvement in up to 90% of patients, with minimal side effects[15].

The second line of treatment is indicated for patients with debilitating breast pain, resulting in significant impairment in their quality of life. The therapy consists of the use of tamoxifen 10 mg/day, an antiestrogen medication, with efficacy demonstrated in a meta-analysis, proving to be more effective than placebo, with statistical significance (from 71% to 96%). However, this medication is associated with numerous side effects, such as exacerbation of menopausal symptoms such as hot flashes, vaginal dryness, joint pain, and cramping in the lower limbs, in addition to severe events such as cerebrovascular accident, endometrial cancer, and cataract; therefore, it has been little used. Thus, the medication is not routinely used in therapy, although it is recommended in some studies. In turn, gamma-linolenic acid, present in evening primrose oil, has shown positive results in the management of breast pain[15,16].

As for the use of hormones in the treatment of patients with mastalgia, there are controversies, especially with regard to the cyclic nature, since it is not possible to know whether this breast pain is a consequence of the use of oral contraceptives[16]. The administration of isolated progesterone, especially medroxyprogesterone acetate, taken orally or topically, had a negative impact on the control of breast pain[17]. A double-blind study found that natural progesterone, in relation to placebo, administered vaginally, was proved to be beneficial, significantly reducing the pain and local sensitivity. After 6 months, sustained pain and tenderness suppression were observed, without relevant side effects, concluding the possibility of this being a safe alternative to hormonal treatment against breast pain[18,19].

It would also be important to change lifestyle habits, such as quitting smoking, as tobacco users had high rates of breast pain, although there is no robust data to support this statement. Dietary reduction of foods with methylxanthine-like components, such as coffee, tea, and chocolates, can reduce mastalgia, as the biochemical characteristics of these components are capable of increasing cell proliferation, stimulating fibrocystic changes, and causing mastalgia. However, studies have shown that reducing its consumption does not significantly reduce breast tenderness in practice[16,20].

CONCLUSIONS

We found that breast tenderness was a frequent symptom in medical students from the institutions studied and was related to a decrease in quality of life, work performance, and abstention from college classes. We observed that it was associated with a sedentary lifestyle, a fact that increased the risk of the symptom by 10 times compared to those who practiced physical exercise at least once a week. The risk of abstaining from classes was about 15 times higher in the group that reported breast pain compared to the group that did not have this symptom. Pharmacological treatment, for a period of less than 3 months, showed improvement in 92% of cases with this complaint.

AUTHORS' CONTRIBUTION

WL: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization,

Writing – original draft, Writing – review & editing. LBL: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft. FVS: Conceptualization, Data curation, Formal analysis, Investigation, Project administration, Visualization, Writing – original draft. NABA: Conceptualization, Data curation, Formal analysis, Investigation, Project administration, Visualization, Writing – original draft. ERMC: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing-original draft, Writing – review & editing. DGT: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Validation, Visualization, Writing – original draft, Writing – review & editing.

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