

## Original Research Article

# Role of vitamin E in management of mastalgia without a palpable lump

Manga Muralidhar<sup>1\*</sup>, Suneel Kumar Keerthi<sup>1</sup>, Sujatha Rani Akuri<sup>2</sup>, Swetha Dongari<sup>1</sup>

<sup>1</sup>Department of Surgery, <sup>2</sup>Department of Biochemistry, Gandhi Medical College, Secunderabad, Telangana, India

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**\*Correspondence:**

Dr. Manga Muralidhar,

E-mail: [mmanga007@gmail.com](mailto:mmanga007@gmail.com)

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### ABSTRACT

**Background:** Mastalgia also known as mastodynia/mammodynia/mazoplasia is defined as a dull ache or heaviness in the breast. It is a common and troubling condition occurring in about 60-70% of women at some stage of their lives. Mastalgia without a palpable lump poses a significant problem to the surgeons. Mastalgia can significantly affect the quality of life in some women. The major question that worries the patient is the risk of malignancy. Reassurance plays a key role. This study was done to assess the role of vitamin E in treating mastalgia.

**Methods:** 700 patients who presented to surgical OPD with chief complaint of mastalgia between August 2013 and August 2015 in a tertiary care hospital were examined. 660 of these patients had a palpable lump. 40 patients who complained of pain in one or both breasts but without a palpable lump were included in the study. Severity of pain was marked on pain grading scale. Biochemical tests for lipid peroxidation i.e., malondialdehyde (MDA) and superoxide dismutase (SOD) which are markers of oxidative stress were assessed on first visit. Women complaining of mastalgia but without a palpable breast lump were treated by administration of vitamin E (cap. evion) 200 mg once daily for 3 months and reassessed both clinically and biochemically.

**Results:** Women treated by vitamin E for 3 months showed a decrease in severity of pain as measured by numerical pain rating scale. Biochemical analysis showed significant decrease in oxidative stress markers MDA and SOD.

**Conclusions:** Oxidative stress is the primary cause for mastalgia without a palpable lump. Vitamin E at a dosage of 200 mg once daily for 3 months has a significant role in the management of such cases.

**Keywords:** MDA, Mastalgia without a palpable lump, Numerical pain grading scale, Superoxide dismutase, Vitamin E

### INTRODUCTION

Mastalgia is defined as dull ache or heaviness in the breast. It can be unilateral or bilateral. It is also known as mastodynia/mammodynia/mazoplasia.<sup>1</sup> Mastalgia can be due to various reasons like mastitis, breast abscess etc. conditions that mimic mastalgia include chest wall trauma, rib fractures, costochondritis, fibromyalgia, psychological causes etc. The most common cause of mastalgia is aberration of normal development and involution (ANDI) of breast tissue.<sup>1,2</sup> It can occur during adolescence, pregnancy and perimenopause. It can be cyclical and non-cyclical with peak incidence between 35-45 years.<sup>1,2,3</sup>

Obstetricians and gynaecologists of Canada (SOGC) in 2006 have considered the effect of various treatment modes and health practices including medications in the management of mastalgia. According to a double blinded randomized placebo controlled study conducted by Pruthi et al, daily doses of 1200IU, 3000 mg EPO, or vitamin E and EPO in combination at these same dosage taken for 6 months decreased the severity of cyclical mastalgia.<sup>4</sup>

According to the study done by Dr. Gen Gunter, there are 5 studies in the world literature addressing vitamin E and breast pain of which 3 are randomized double blind, placebo-controlled state that there is no effect of vitamin E on breast pain and 2 randomized double blinded

placebo controlled studies say that it is beneficial. Antioxidants act by preventing the formation of reactive oxygen species (ROS) and also scavenging reactive oxygen species.<sup>5</sup> Lack of ROS causes chronic granulomatous disease, autoimmune disorders and excess of production of ROS causes cardiovascular and neurodegenerative diseases. Vitamin E is an antioxidant and a peroxy radical scavenger.<sup>7</sup> Evaluation and management of mastalgia without a palpable mass poses a difficult situation to the surgeon. Hence this study was done.

This study is aimed to correlate oxidative stress as the causes of mastalgia in women presenting with breast pain due to various reasons of the excluding all other breast related conditions causing breast pain and breasts with palpable lesions. This study is also aimed to understand the effectiveness of vitamin E in the treatment of mastalgia and the correlation of it with biochemical markers for oxidative stress which are done after 3 months of starting vitamin E.

The objective of this study was to correlate oxidative stress as cause of mastalgia in women with clinically no palpable breast lump and to evaluate effectiveness of vitamin E in its treatment.

## METHODS

This study include 700 women attending to surgical OPD in a tertiary care hospital from August 2013 to August 2015 with chief complaints of pain in one or both the breasts within the age group of 15-65 years. Patients with complaints of breast pain without a palpable mass (40 out of 700) were included in the study. Patients with complaints of breast pain having clinically palpable lesions like fibro adenoma, fibro adenosis, breast cancer, antibioma (660 out of 700) were excluded from the study as shown in Table 1. Biochemical tests for lipid peroxidation i.e., malonaldehyde (MDA), and superoxide dismutase (SOD) which are markers of oxidative stress was carried out on 1<sup>st</sup> day.<sup>6</sup> Severity of pain measured on pain grading scale. Patient was started on vitamin E (capsule evion 200 mg once daily) for 3 months. Follow-up of each patient after 3 months was carried out by clinical examination comparing the change in the severity of breast pain and measurement of oxidative stress level

markers i.e., MDA and SOD. After obtaining detailed clinical history, clinical examination was done and recorded. Pain was marked on the pain grading scale.

Mastalgia patients with no palpable mass are evaluated further. Apart from routine investigations the following investigations are performed.

**Table 1: Various causes of mastalgia in this study.**

Disease (total 700 cases)	Number	Percentage (%)
Fibroadenoma	482	68.8
Fibroadenosis	78	11.1
Abscess	50	7.14
Cancer	28	4
Nipple discharge	8	1.14
Antibioma	4	0.57
Galactocoele	4	0.57
Eczema	2	0.28
Sebaceous cyst	4	0.57
Mastalgia without a palpable lump	40	5.71

- Malonaldehyde (MDA) was measured by chemical method using trichloroacetic acid for protein precipitation and thiobarbituric acid for colour development. The chromogen was measured using colorimetry at 530 nm
- Superoxide dismutase (SOD) test was done by using TRIS HCL buffer pyrogallol and normal saline. Quantity was measured by spectrophotometry. At 420 nm.

Patients were given vitamin E 200 mg OD for 3 months. Patients were followed by measurement of oxidative stress level markers after 3 months of vitamin E therapy.

## RESULTS

The average pain score as calculated by numerical pain rating scale there was a decrease in the severity of pain from average score of 5.4 to 3.6 and was shown to be statistically significant as calculated by paired T-test, P value <0.001. The average serum level of MDA was 1.97 micromoles/liter before starting treatment with vitamin E and 1.57 micromoles/litre after treatment with vitamin E.

**Table 2: Pain and biochemical markers.**

Observations	Before treatment	After treatment	p value
Pain	5.4	3.6	<0.001
Serum MDA	1.97 micromoles/lit	1.57 micromoles/lit	<0.001
Serum SOD	243.7 units/ml	227.2 units/ml	<0.001

The average serum level of SOD was 243.7 units/ml before treatment with vitamin E and 227.2 units/ml after

treatment with vitamin E. The results of biochemical markers showed decrease in oxidative stress markers

MDA, SOD after the use of vitamin E 200 mg for 3 months and was shown to be statistically significant by paired T test with P value <0.001.

## DISCUSSION

Mastalgia is a common and enigmatic condition which occurs in about 60-70% women at some stage of their lives.

Out of 700 patients who presented to surgery OPD from August 2013 to August 2015 with complaints of pain in one or both breasts due to various reasons only 40 cases had mastalgia without a palpable lump. In western societies mastalgia without underlying pathology is common complaint that may affect up to 60-70% of women in their lifetime. It is less common in Asian cultures, effecting as few as 5%<sup>7</sup>. This is seen in our study as out of 700 patients only 40 cases had mastalgia accounting to 5.7%. The most common cause of breast pain as seen by our study is fibroadenoma accounting to 68.8%. The least of number of cases of breast pain seen in our study was eczema of the breast, only 2 cases are seen.

The study showed that out of 40 patients 39 had breast pain alone as the chief presenting complaint. One case presented with nipple discharge as the presenting complaint along with breast pain.

The study showed that 34 patents had non-cyclical breast pain that 6 of them had cyclical mastalgia. Study conducted by Maddox PR, Harrison BJ et al showed that cyclical mastalgia was prevalent in 67% cases when compared to non-cyclical mastalgia.<sup>3</sup> In our study only 15% cases had cyclical mastalgia compared to 85% of cases having non-cyclical mastalgia. It is not unusual for women to have 2-3 days of mild breast pain pre-menstrually but 8-30% of women report moderate to severe breast pain with duration of 5 or more days each month.<sup>3</sup> But in our study relatively less number of cases was of cyclical mastalgia.

The study showed decreasing MDA, SOD levels in women after the use of vitamin E for 3 months. According to the study "therapeutic effects of vitamin E on cyclical mastalgia" by Parsya S, Olfati F, Nahidi S it was shown that there was no significant different in the received between treatment courses of 2 versus 4 months.<sup>8</sup> Given its lack of significant side effects, vitamin E, therefore, can be considered a safe alternative to hormonal therapies currently being used in the treatment of cyclical mastalgia. Meyer and associates randomized 105 women into a double blind placebo controlled crossover trial with vitamin E for 3 months and reported improvement with vitamin E as 37% compared to 19% on placebo.<sup>9</sup> In our study we gave vitamin E for women for a period of 3 months and all the patients had significant decrease in pain as measured by numerical rating scale.

This study also showed that the average pain score as calculated by numerical rating scale, there was a decrease in the severity of pain and it showed to be statistically significant as calculated by paired t-test, p value <0.001.

The results of the study showed significant decrease in oxidative stress markers MDA and SOD after the use of vitamin E 200 mg for 3 months. The results showed to be statistically significant as calculated by paired t-test with p value <0.001.

## CONCLUSION

The study is focused on cases of mastalgia with clinically no palpable mass. Among the cases presenting with breast pain 660 (94.3%) had a clinically detectable lesion while mastalgia with clinically no palpable mass accounted to 40 (5.7%) of all the cases of breast pain.

Oxidative stress is the primary cause for mastalgia as shown by increased levels of MDA and SOD in these patients. There is decrease in the MDA and SOD levels in the cases after using vitamin E for 3 months and the decrease in the serum levels of MDA and SOD are compared before and after vitamin E therapy by PAIRED t-test with p value <0.01.

Thus vitamin E is the safest line of treatment for mastalgia with negligible side effects when compared to side effects seen by other drugs like evening prime rose oil (EPO), pyridoxine hydrochloride and tamoxifen. The side effects of these drugs are varied, from gastro intestinal symptoms, headache, and sleep disturbances to thromboembolism and increased risk of endometrial carcinoma. The only side effect of vitamin E is its property of anti-coagulation seen at doss of 1000 mg/day. Thus the studies conclude that vitamin E in low doses of 200 mg/day for 3 months can be used to achieve favorable results in treatment of mastalgia.

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