

Special Article - Vitamin D Deficiency

Breast Pain and Vitamin D Deficiency

Sadaf Alipour^{1,2*}, Maryam Azari³, Hadith Rastad⁴, Ladan Hosseini⁴, Azin Saberi¹ and Akram Seifollahi⁵

¹Department of Surgery, Arash Women's Hospital, Tehran University of Medical Sciences, Iran

²Vali-e-Asr Reproduction Health Research Center, Tehran University of Medical Sciences, Iran

³Breast Clinic, Arash Women's Hospital, Tehran University of Medical Sciences, Iran

⁴Research Development Center, Arash Women's Hospital, Tehran University of Medical Sciences, Iran

⁵Department of Pathology, Arash Women's Hospital, Tehran University of Medical Sciences, Iran

*Corresponding author: Sadaf Alipour, Department of Surgery, Arash Women's Hospital, Tehran University of Medical Sciences, Shahid Baghdarnia (North Rashid) St, Ressalat St, Tehran, Postal Code: 1653915911, Iran, Tel: 0098 21 77883195; Fax: 0098 77883196; Email: sadafalipour@yahoo.com

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Introduction

While completing a clinical trial regarding effects of administration of vitamin D on mammographic density, we observed that several participants stated obvious decrease in their breast pain, which was not a study criterion in the trial. Therefore, we hypothesized that one of the etiologies of breast pain could be vitamin D deficiency. We had already performed a study assessing vitamin D levels in some breast pathologies and compared them with control groups [1]. In order to investigate the association of mastalgia with serum vitamin D levels, we retrospectively reviewed the breast clinic records about breast pain in the control group of the above study.

Methods

Participants had been selected among women attending the breast clinic of Arash Women's Hospital, a university hospital affiliated to Tehran University of Medical Sciences, for breast cancer screening or any breast complaint. We retrospectively reviewed the breast clinic records of women who had normal breasts in physical exam and imaging and whose serum vitamin D levels had been measured in our hospital during the last year. Exclusion criteria included chronic illness, history of cancer, pregnancy or lactation, malabsorption syndrome or gastric disorders, metabolic bone disease, renal or hepatic failure, recent history of therapeutic vitamin D consumption or osteoporosis treatment. Breast exam had been carried out by one of two breast surgeons in the clinic, mammography had been performed for all women above 40 years of age; and ultrasonography as indicated by the radiologist or the breast surgeon in this age group, and in all patients less than 40 years of age. Women who had complained of breast pain as recorded in datasheets were considered as the Case or Mastalgia group and those without pain as the Control or Normal Group. Exclusion criteria consisted of

Abstract

In order to investigate the association of breast pain with vitamin D deficiency, serum levels of vitamin D were compared between women with and without mastalgia. Levels of vitamin D >75, 50-75, 25-50 and < 25 nmol/L were respectively considered as normal, mild, moderate and severe deficiency. There were 166 and 114 women in the case and control groups respectively. Final analysis showed that vitamin D deficiency was more frequent in the mastalgia group but the difference was not significant. We believe that further prospective studies are needed to clarify the subject.

Keywords: Breast pain; Mastalgia; Vitamin D deficiency

consumption of any form of Vitamin D supplement in the last two years, recent treatment of osteopenia or osteoporosis, and history of any cancer or renal failure.

A 2 milliliters sample of blood had been taken by a laboratory technician from all the participants and refrigerated in -40 degrees centigrade for less than one month. Levels of vitamin D had been measured by the electrochemiluminescence method (Roche, Cobas e411, Germany) in all samples in the hospital laboratory.

Serum levels >75 and ≤75 nannomole per liter (nmol/L) were respectively considered normal and deficient. Degree of vitamin D deficiency was classified as mild deficiency in levels between 50 and 75 nmol/L, moderate deficiency if from 25 to 50 nmol/L and severe deficiency when serum levels were less than 25 nmol/L [2]. In this case-control study, we used simple logistic regression to assess the association between deficient or insufficient vitamin D levels — the exposure or independent variable — and the likelihood of having mastalgia — the outcome or dependent variable, among participants. We then used multiple logistic regression to assess the relationship after controlling for age as covariate; SPSS® 16.0 software (SPSS Inc., Chicago, IL, USA) was used for analyzing data. P. value <0.05 was considered significant.

Results and Discussion

Among the 316 women who could have been enrolled in the study, 284 had answered to the question about breast pain. From these, 166 had breast pain and were included as the case group, and 114 had no pain and constituted the control group. Age range was 42.89 ± 12 years overall, and 42.19 ± 11 years in the case and 46.6 ± 9 years in the control group. Numbers of patients with normal and low levels of vitamin D and those in each subgroup of vitamin D deficiency regarding mastalgia

Table 1: Mastalgia status in normal and deficient levels of vitamin D.

Mastalgia	Vitamin D status				
	Normal* Number (percent)	Deficiency** Number (percent)			All
		Mild*	Moderate**	Severe***	
No	45 (39.5%)	5 (4.4%)	13 (11.4%)	51 (44.7%)	69 (60.5%)
Yes	50 (30.1%)	13(7.8%)	24 (14.5%)	79 (47.6%)	116 (69.9%)
Total	95 (33.9%)	18 (6.4%)	37 (13.2%)	130 (46.4%)	185 (66.1%)

Serum vitamin D: * >75 nmol/L, ** ≤75 nmol/L, * = 50-75 nmol/L, ** = 25-50 nmol/L, *** < 25 nmol/L

Vitamin D deficiency was more common among those who had mastalgia compared with control group but this difference was not statistically significant (p-value= 0.10), this observation was the same in comparison of four groups of vitamin D levels (normal, mild, moderate and severe deficiency). After adjusting for age, there was still no significant difference between the two groups (case and control) in frequency of vitamin D deficiency [CI 95%, (0.67-1.97); p-value = 0.6].

Vitamin D deficiency can be regarded as a global health issue, more frequent in developing countries [3]. Receptors of vitamin D are present in many body tissues, and as a consequence this vitamin can have various influences on different organs. Vitamin D deficiency is recognized as the etiology of several chronic diseases such as cancers and autoimmune, cardiovascular or infectious diseases [2,4]; it is now inevitably been addressed in many studies as the triggering cause for many other disorders. One of the recently considered areas is the association of vitamin D deficiency with breast disorders. In this field, the issue that is mostly focused on, is the probable role of vitamin D in breast cancer pathogenesis, but benign disorders have also been considered. The Nurse's Health Study II showed an inverse association between vitamin D consumption and proliferative benign breast disorders [5], and Lopes et al detected some abnormalities in expression of vitamin D receptors in benign breast diseases [6]. Nevertheless, the National Breast Screening Study in Montreal, Canada detected a higher level of vitamin D intake in women affected by fibrocystic breast changes [7], Rohan et al found no difference in the incidence of proliferative breast disorders after seven years of vitamin D versus placebo consumption in their trial [8], and Alipour et al could not show any significant difference in serum vitamin D levels between women with normal breasts and those with benign breast mass [1].

Breast pain is a very frequent symptom in the female population [9,10] and can be a source of anxiety due to fear of cancer among women and in severe cases, it may even affect quality of life or disturb partnership. Breast pain can be classified as true breast pain or referred breast pain, mostly from the chest wall. True mastalgia can be cyclic and exacerbate with menstrual cycles, or be non-cyclic and constant. Etiology of mastalgia is uncertain; various factors such as hormonal or dietary issues have been implicated [11,12]. Because of the unknown origin of breast pain, treatment guidelines are not clearly defined. Various therapies have been suggested from old times till now, from reassurance to oral nonsteroidal analgesics, to hormone therapy [13-15]. Among vitamins, vitamins A, B₆ [15,16] and E have been prescribed for true mastalgia; the latter is widely used and is still recommended in treatment of this disorder [17-19]. Nevertheless, to

our knowledge, the association of deficient levels of vitamin D with mastalgia and its effect on pain improvement have not been studied.

In our study, the proportion of cases with vitamin D deficiency was higher in the mastalgia group (69.9% versus 60.5%), and this trend was seen in all three levels of deficiency (mild, moderate, and severe), although the differences were not significant.

Because data had been completed by patients in the breast clinic datasheets, true mastalgia had not been differentiated from referred breast pain (chest wall pain) and demographic data are not complete. This is one of the limitations of our study. As well, vitamin D is present in many foods, and the daily consumption of vitamin D in their regimens has not been considered in the study. In addition, severity of pain and its relation with menstrual cycles has not been defined, and because mild levels are not a problem and generally need no intervention, we believe that a prospectively-designed study which investigates levels of vitamin D in moderate or severe true mastalgia could better clarify the association of vitamin D and mastalgia.

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