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Original Research Article

Authenticity of vitamin D in modified vaginal health index in geriatric subjects

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ABSTRACT

Background: Role of vitamin D is very well known for the functioning of many body organs. But its role in the post menopausal women in relation to various genitourinary disorders has been recognized recently. The main objective of this study was to evaluate role of vitamin D in vaginal health.
Methods: This was a randomized controlled study in which 200 geriatric female patients of 65-78 years of age divided in to two groups comprising of study and control group with 100 subjects in each. Detailed obstetrical, gynecological and clinical history was elicited. Detailed local examination was done followed by follow up of 3 and6 months each. The Chi-square and independent t-test used for data analysis.
Results: There was a visible increasing trend in Vitamin D deficiency with increase in time since menopause p value 0.1193. With increase in vitamin D levels, MVHI was found to be better. MVHI was found to increase significantly with Vitamin D supplementation at 3 and 6 months follow up.
Conclusions: Intake of Vitamin D in older females led to improvement of MVHI in this study but further evaluation of the role of vitamin D as a modifiable causative factor in improving vaginal health is warranted.

Keywords: MVHI, Postmenopausal, Vitamin D

INTRODUCTION

People over the age of 65 have different degrees of disability and illness. Older persons may react to illness and disease differently than younger adults. Menopause is characterized by falling levels of estrogen and progesterone, which can lead to the development of symptoms including hot flushes, night sweats, and vaginal dryness. It is undisputed fact that increasing age effects consistency/moisture, rugosity, elasticity, length, epithelial integrity and vascularity of vagina.[1]

In a normal condition, the vaginal epithelium is moist, and thick, whereas in estrogen deficiency, it becomes dry and thin. So, external intervention is needed to reduce these symptoms. Although vaginal estrogens are an effective treatment for vulvovaginal atrophy, there are concerns in some women with a history of breast or endometrial hyperplasia. Therefore, safe treatment is desirable to enhance vaginal lubrication. Vitamin D is known to be involved in the regulation of growth and differentiation of body cells, especially squamous epithelium, present in the vagina.[2] Therefore, this vitamin could be effective in proliferation and repair of epithelial vaginal tissue.[3] Yildirim et al, have demonstrated that Vitamin D supplementation resulted in squamous maturation of the vaginal epithelium.[2] These findings suggest that there must be an intracellular receptor in vaginal epithelium. It has been documented that the vaginal epithelium becomes atrophic in the absence of estradiol. Use of calcitriol has a beneficial effect on vaginal atrophy in postmenopausal women and it could

be an alternative to estrogen therapy. Treatment with exogenous vitamin D3 in ovariectomized rats led to expression of vitamin D receptor in the superficial layers of the vaginal epithelium.[4]

Conflicting reports suggest that Vitamin D treatment following discontinuation of postmenopausal hormone therapy in osteoporotic women cause the worsening of vaginal atrophy symptoms.[3] This contrasting evidence created some questions about the beneficial effects of vitamin D on vaginal atrophy which are still unanswered. Therefore we decided to correlate MVHI, an index for post menopausal perineal changes and vitamin D.

METHODS

This study consisted of a total of 200 subjects divided into two groups of 100 cases each. Test group (group A) comprised of 100 patients having gynecological diseases associated with vitamin D deficiency and control group (group B) comprised of 100 subjects (normal subjects or having generalised non specific complaints). Females aged more than 65 years attending the OPD/ Indoor of Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar were enrolled in this study. Data thus obtained was statistically analyzed. Subjects of more than 65 years of age and those having chronic renal disease, already taking calcium and vitamin D were excluded from this study.

An informed written consent of the patient was obtained before inclusion. Clinical history and detailed general physical examination and local pelvic examination were performed as per predetermined parameters. Appropriate laboratory values as per clinical requirement, ultrasound examination for any pelvic pathology and other relevant investigations related to pelvic floor diseases and tumors were performed.

Table 1: Modified vaginal health index.

Parameters	1	2	3
pH	> 6.5	5 - 6.5	< 5
Moisture/consistency	No moisture	Minimal moisture/ superficial layer of scanty thin white mucous	Normal moisture/ with flocculent fluid
Rugosity	None	Minimum	Good
Elasticity	Poor	Fair	Excellent
Length of vagina	<4 cm	4 - 6 cm	>6 cm
Epithelium integrity	Petechiae present	Petechie after scraping	Normal, not friable
Vascularity	Minimal	Fair	Good

Modified vaginal health index was calculated. Seven parameters are included in modified vaginal health index. Each parameter is graded from 1 to 3 and total score ranges from 7 to 21. The lower score has greater vaginal atrophy and vice versa (Table 1).

pH was noted by litmus paper kept in the vagina for 1 minute and the colour compared to standardized colours . Moisture/consistency of the fluid was measured by putting the vaginal fluid on a clean glass slide for grading. Rugosity and elasticity was assessed by inspection and palpation of vaginal mucosa by the index finger. Length of the vagina was measured by the index finger and Ayre's spatula from the highest point in the vagina till the vulval outlet. The mean of the two measurements was taken as average length. Epithelial integrity was assessed by presence of petechiae on the vaginal wall by pressure of index finger. Vascularity was assessed by inspection of the colour of the vagina**.**

Serum 25-hydoxyVitamin D3 levels were measured using Enzyme Immuno Assay (ELISA Kits).

Evaluation of results

Staging of Vitamin D deficiency was done by criteria as follows:

- Deficiency (Seriously affected) <12ng/ml
- Insufficiency (Deficient) 12-30 ng/ml
- Sufficiency (Adequately supplied) >30ng/ml

The serum Vitamin D levels in geriatric females with gynecological diseases associated with vitamin D deficiency were compared with control group (normal subjects or having generalized non specific complaints) to determine the correlation undertaken in this study.

The Vitamin D deficiency was replenished by oral administration of weekly 60000 IU cholecalciferol granules or tablets in 10 weeks and then every 3 months and followed up till 6 months. The life style dietary modifications were advised. Calcium supplementation 1000-1200mg daily was advised. The repeat clinical examination, Vitamin D and other lab values were done after 3 and 6 months and improvement reviewed. Selectively the patients were subjected to other tests related to co-morbidities.

RESULTS

All the women in the study group had vitamin D insufficiency. Among study group, 30 women had vitamin D levels below 12ng/ml. In control group, 21 women had vitamin D levels below 12ng/ml (Table 2). Mean of vitamin D level in study group was 12.962±7.169. In controls the average mean of vitamin D level was 14.584±7.299. There was a statistically insignificant overall increase in vitamin D levels among controls, p value being 0.1145 (Table 3).

More subjects became deficient in vitamin D with increasing age (Table 4). The association was found to be

statistically insignificant, p value being 0.18315. There is a visible increasing trend in vitamin D deficiency with increase in time since menopause (Table 5).

Table 2: Level of vitamin D.

Vitamin D	No of patients in study group	No of patients in control group
<12ng/ml	30	21
12-30ng/ml	70	72
>30ng/ml	0	7

Table 3: Mean of vitamin D level.

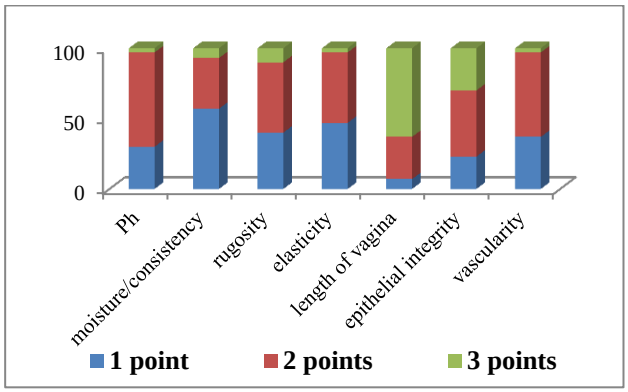
Group	Mean	Std deviation	Std error of mean	P value
Study group	12.962	7.169	0.716	0.1145
Controls	14.584	7.299	0.729	

Table 4: Correlation of vitamin D with age.

Age distribution	Vit D<12ng/ml	Vit D12-30ng/ml
65-69 yrs	9	42
70-74 yrs	18	50
≥75 yrs	24	50

Table 5: Correlation of vitamin D with menopausal age.

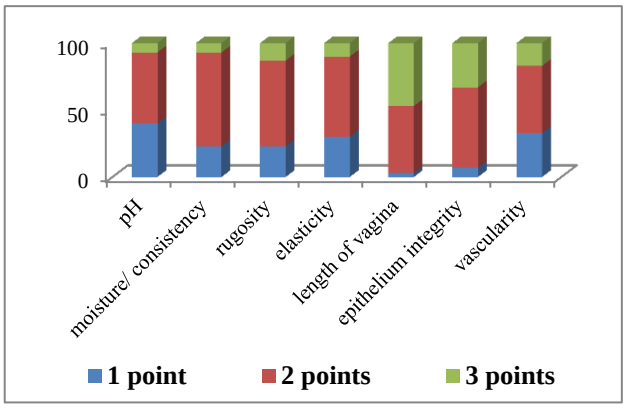
Time since menopause	Vit D<12ng/ml	Vit D12-30ng/ml
<15 yrs	18	70
15-20 yrs	24	59
>20 yrs	9	13



Number of subjects in study group with 1, 2 and 3 points in various parameters of modified vaginal health index

Figure 1: Modified vaginal health index in study group.

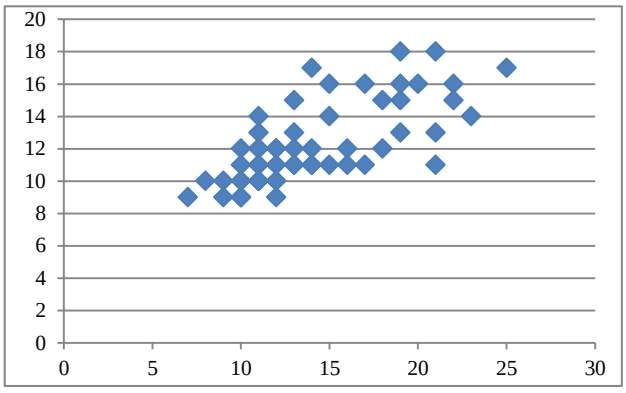
A statistically insignificant association was found with a p value 0.1193. As per Figure 1, age affected each parameter of MVHI variably. Out of all study groups, maximum affected parameters were moisture/consistency followed by elasticity, rugosity and vascularity. Length of vagina, pH and epithelial integrity were less affected parameters. Number of subjects in control group with 1, 2 and 3 points in various parameters of modified vaginal health index are depicted in Figure 2.



Number of subjects in control group with 1, 2 and 3 points in various parameters of modified vaginal health index

Figure 2: Modified vaginal health index in control group.

In the present study, mean vitamin D levels in overall study group was 12.962±7.169ng/ml. In the present study, with increase in vitamin D levels, modified vaginal health index was found to be better. There was positive association with correlation coefficient being 0.239. p value was 0.046 which was statistically significant. In the scatter diagram it is visible that women with vitamin D levels less than 12ng/ml have evidently less values of modified vaginal health index (Figure 3). MVHI was found to increase significantly with Vitamin D supplementation at 3 and 6 months follow up (Table 6).



Women with vitamin D level less than 12ng/ml have less values of MVIH.

Figure 3: Modified vaginal health index.

Table 6: MVHI at 3 and 6 months follow up.

MVHI	Study subjects	Controls
1st Visit	12.85±2.72 (n=100)	13.4±2.5 (n=100)
3 Months	13.12±2.63 (n=93)	13.64±2.58 (n=87)
6 Months	13.32±2.67 (n=82)	13.82±2.60 (n=70)

DISCUSSION

Most of the subjects were in the age group of 65-69 in contrast to 70-74 years category. In this study, mean MVHI was 13.12±2.72. Sharma P and colleagues found mean MVHI as 12.17 in post menopausal patients1.In a study by Swati Sharma et al, mean MVHI among cases with POP was 12.67±2.7215. Average MVHI among controls was 13.40±2.5.In the present study all the women had Vitamin D less than 30ng/ml. The result was in accordance with previous studies. In the study by Badalian and co-workers, 82% had vitamin D less than 30ng/ml.[6] The small difference could be accounted by the fact that nutrition status in our country is poor as compared to western countries. In the present study, mean vitamin D levels in overall study group was 13.7±7.169. In a study by Swati Sharma et al, the controls had a mean vitamin D level of 14.5 ng/ml compared to cases which had a lower mean of 11.8 ng/ml.[5] In our study, with increase in vitamin D levels, modified vaginal health index was found to be better. There was positive association with p value of 0.046 which was statistically significant. Similar results were shown in studies by Parastou Rad et al, and Swati Sharma et al, in which increase in vitamin D levels showed improvement in MVHI and vaginal pH.[3,5] In our study, vitamin D and calcium supplementation was given to all subjects with vitamin D insufficiency and deficiency and all biochemical parameters along with clinical response was noted on subsequent follow ups after 3 and 6 months. MVHI levels improved withVitamin D supplementation at 3 and 6 months follow up similarly Parastou Rad et al, in their study found Vitamin D to be effective in improving the maturation index and decreased the pH and dryness of the vaginal atrophy due to menopause.[3]

CONCLUSION

Present study showed very high prevalence of vitamin D insufficiency and deficiency in geriatric women population. Our findings suggest that treatment of vitamin D insufficiency and deficiency in geriatric women was seen to have positive impact on vaginal tissues as it improved MVHI. Given the increase in the number of patients with gynaecological disorders in geriatric age, further evaluation of the role of vitamin D as a modifiable causative factor in these diseases is warranted.

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