



EFFECTS OF VITAMIN D SUPPLEMENTATION ON UTERINE FIBROID-RELATED HEAVY MENSTRUAL BLEEDING

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Abstract

Objective: To evaluate the association between vitamin D deficiency and heavy menstrual bleeding in women with uterine fibroids and to determine the therapeutic effect of vitamin D supplementation alongside conventional therapy.

Methods: This randomized controlled interventional study was conducted at the Department of Pharmacology, BMSI, in collaboration with the Department of Obstetrics and Gynecology, Jinnah Postgraduate Medical Centre (JPMC), Karachi. A total of 111 premenopausal women (30–50 years) diagnosed with uterine fibroids (3–13 cm) were enrolled. Serum vitamin D levels were assessed, and transvaginal ultrasonography (TVS) was performed. Vitamin D-deficient patients received oral vitamin D supplementation (50,000 IU/week) in combination with tranexamic acid (500 mg) and dydrogesterone (10 mg) for 24 weeks. Pre- and post-intervention comparisons were performed using a paired t-test ($p \leq 0.01$).

Results: Among 111 patients, 81 (73%) were vitamin D deficient. Heavy menstrual bleeding was present in 95 patients. After 90 days, mean serum vitamin D levels significantly increased (22.56 ± 8.25 to 40.25 ± 7.48 ng/mL; $p=0.001$), while mean fibroid size significantly decreased (8.43 ± 1.95 cm to 3.55 ± 1.30 cm; $p=0.001$).

Conclusion: Vitamin D supplementation significantly improved serum vitamin D levels, reduced fibroid size, and decreased heavy menstrual bleeding. Vitamin D may serve as a safe, noninvasive adjunct therapy in women with uterine fibroids.

Key Words: Uterine fibroid, leiomyoma, vitamin D, heavy menstrual bleeding.

Introduction

Uterine fibroids (leiomyomas) are the most common benign tumors in premenopausal women and represent a leading indication for hysterectomy worldwide [1,2]. Heavy menstrual bleeding (HMB), pelvic pressure, pain, and infertility are common clinical manifestations [3,4].

The prevalence of uterine fibroids ranges between 54–77% globally, with a reported frequency of approximately 54% in Pakistan [2]. Heavy menstrual bleeding significantly affects quality of life and may lead to anemia and reproductive complications [4,5].

Emerging evidence suggests that vitamin D plays a regulatory role in cellular proliferation and apoptosis. Vitamin D receptors have been identified in uterine tissue, and deficiency has been associated with increased fibroid growth and volume [8,9]. Vitamin D may exert anti-fibrotic effects by suppressing transforming growth factor- β 3 (TGF- β 3) and collagen expression [1].

Conservative management options include hormonal contraceptives, GnRH analogs, selective progesterone receptor modulators, and tranexamic acid [5, 6]. However, growing evidence supports vitamin D supplementation as a potential adjunct therapy [11–13].

Material and Methods:

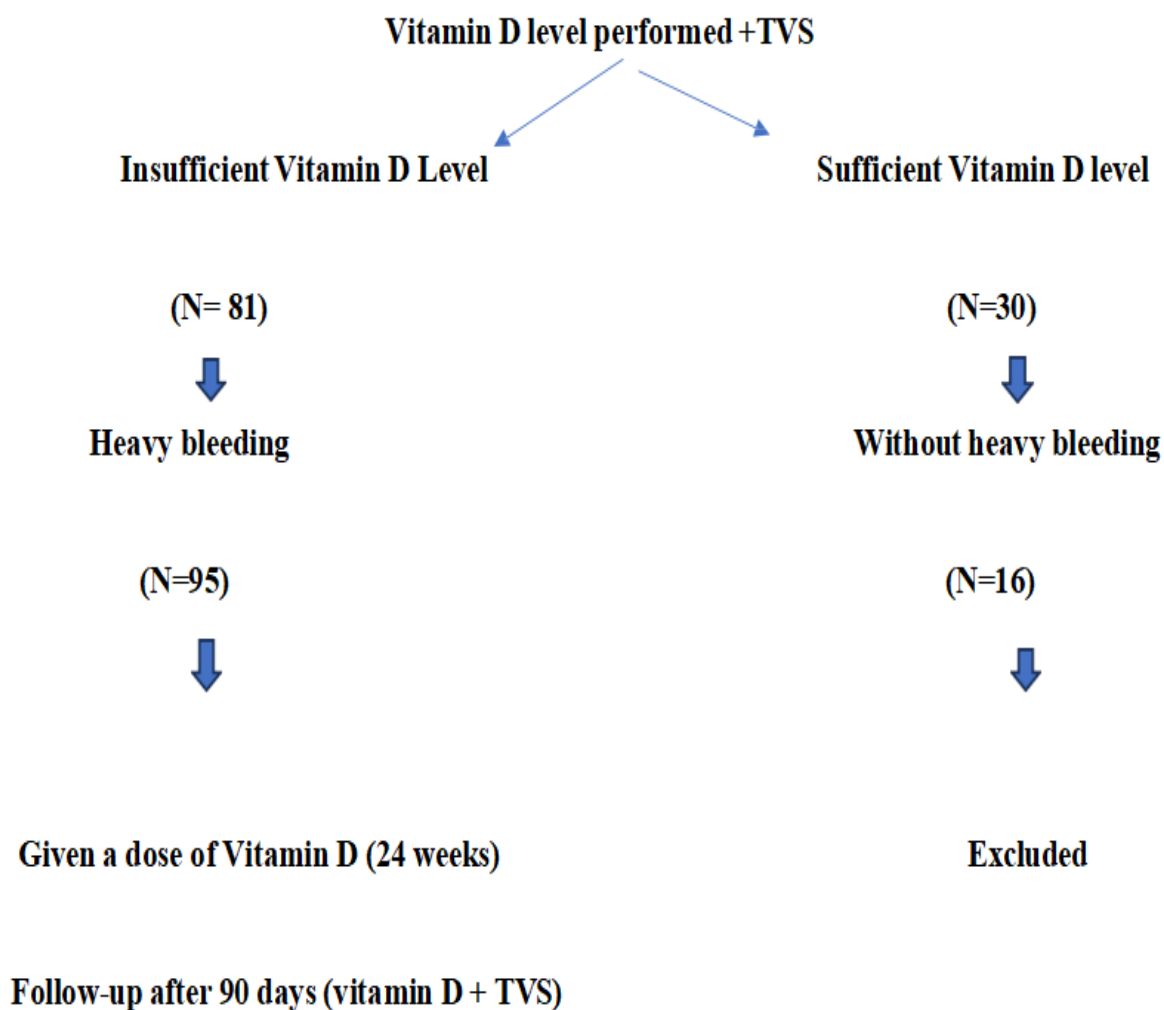
This randomized controlled interventional study was conducted at BMSI in collaboration with JPMC, Karachi. A total of 111 premenopausal women aged 30–50 years with uterine fibroids (3–13 cm) diagnosed via TVS were included [7].

Vitamin D status was assessed using standardized serum assays [10]. Patients with vitamin D deficiency received:

- ☐ Vitamin D 50,000 IU orally once weekly
- ☐ Tranexamic acid 500 mg
- ☐ Dydrogesterone 10 mg Treatment duration: 24 weeks.

Statistical analysis was performed using NCSS 2020 software. Paired t-test was applied, and $p \leq 0.01$ was considered statistically significant.

111

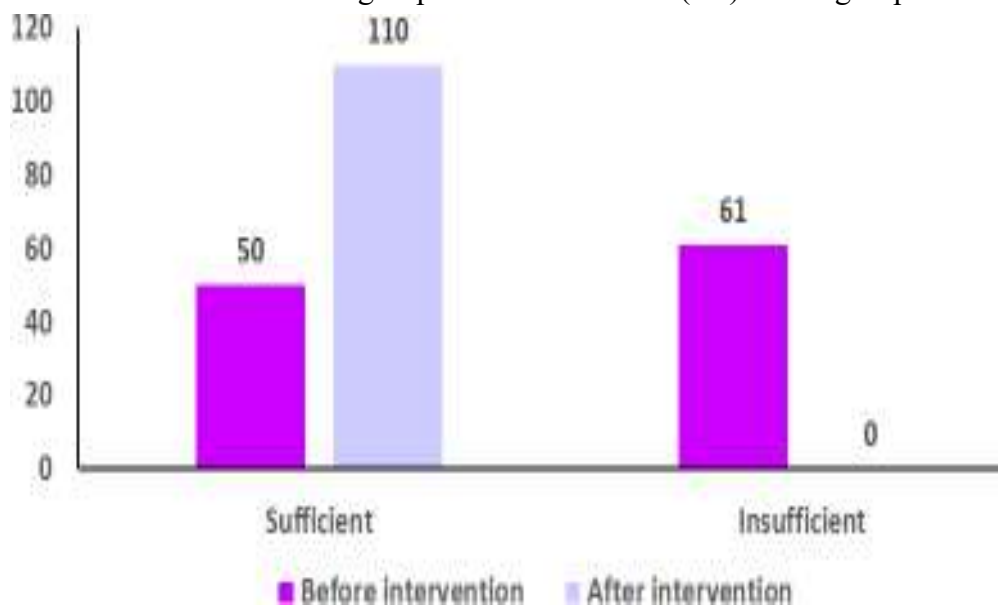


Result

Table: Comparison of Variables within Group A and Group B

Variables	Baseline Mean ±SD	Day 90 Mean ±SD	P-Value
Group A (Heavy Bleeding) (n=95)			
Serum Vit D (ng/dl)	22.56 ± 8.25	40.25±7.48	0.001
Fibroid Size (cm)	8.43 ±1.95	3.55 ± 1.30	0.001
Group B (Without Heavy Bleeding) (n=16)			
Serum Vit D (ng/dl)	19.10 ± 6.13	38.24 ± 5.27	0.001
Fibroid Size (cm)	8.79 ± 2.15	3.65 ± 1.10	0.001

The table displays the average uterine fibroid size with and without significant bleeding. The baseline means and standard deviation of the size of the uterine fibroid of group A was 22.56 ± 8.25 , and another group B had a baseline mean and standard deviation of the size of uterine fibroid in cm was 8.79 ± 2.15 . After the intervention, the size of the uterine fibroid regressed in Group A at about 3.55 ± 1.30 cm and the p-value was significant, meanwhile, vitamin D at the baseline in Group A was 8.43 ± 1.97 ng/dl, and in Group B the baseline level of vitamin D was 19.10 ± 6.13 ng/dl and at day 90 the size of uterine fibroid in group A was 3.55 ± 1.30 (cm) and in group B was



3.65 ± 110 cm respectively. Meanwhile, at day 90 the level of vitamin D in group A was 40.25 ± 7.48 ng/dl and the group B the level of serum vitamin D was 38.24 ± 5.27 ng/dl. And the p-value was significant.

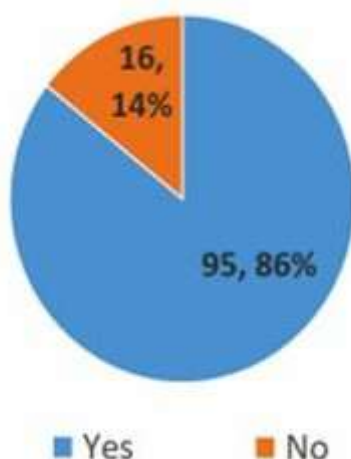
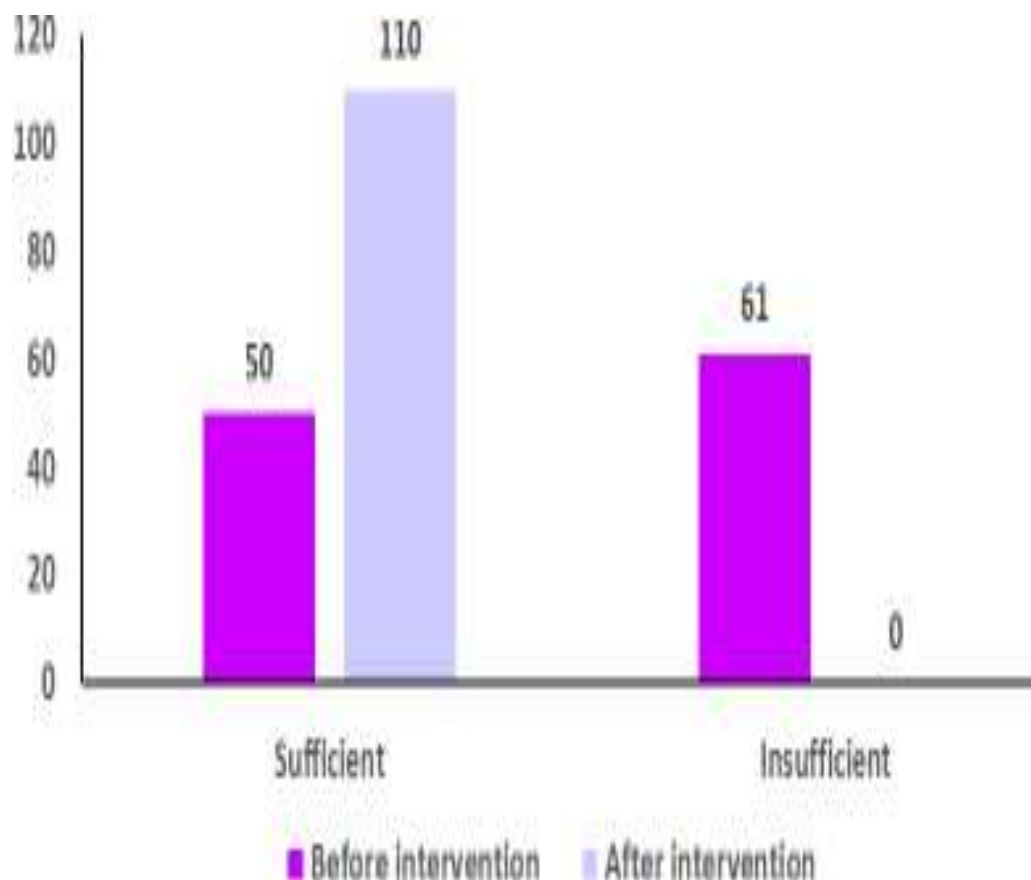


Figure1: Modification in the level of Vitamin D(ng/ml) between heavy uterine bleeding associated with uterine fibroid

Modification in serum Vitamin D (ng/ml) between cases with and without heavy bleeding

Figure 2: Modification in serum Vitamin D (ng/ml) among cases with and without heavy bleeding



Discussions:

The research was carried out at Jinnah Postgraduate Medical Center's Obstetrics and Gynecology Department, Karachi, which is Sindh's big tertiary care hospital. In our study, individuals with the most prevalent symptoms, such as uterine hemorrhage, were treated with vitamin -D in addition to standard treatment, and their symptoms improved in the meantime. Before given intercession, the mean difference in Vitamin D level (ng/dl) in group A was 22.56 ng/dl, and after the intervention, the mean difference in Vitamin D level was 40.25 ng/dl) Many investigations showed that severe menstrual bleeding was reduced by 29.89% ($p=0.003$), mean uterine volume was lowered by roughly 6%, and baseline vitamin D levels improved (17.44 to 39.38, $P=0.001$) [8]

In our trial, we gave uterine fibroid patients 50,000 IU of vitamin D orally once a week for ten months, which significantly improved their symptoms and quality of life. Another open-label clinical trial was undertaken on uterine fibroid and vitamin-D deficient women who received 50,000 IU per week for 8 weeks and 2000 IU per day for 12 months [9]. Many studies found that a loading dosage of vitamin D 50000 and 6000 IU thrice a week for 8 weeks was significant and relieved symptoms of vitamin D insufficiency [10].

Our study found that individuals who were given Tranexamic acid 500 mg and Dydrogesterone 10mg orally, combined with 50,000 IU of vitamin-D supplements, not only had a smaller uterine fibroid but also had fewer symptoms. Another study found that after 8 weeks of treatments, the mean fibroid size decreased from 47.98 to 41.81 mm [11]. Another research concluded that 96% of women with uterine leiomyoma should consider routine vitamin D supplements in addition to other medicines such as mifepristone, tranexamic acid, and mefenamic acid [12].

Conclusion:

Our research establishes and confirms the existence of a strong link between excessive vaginal bleeding in uterine fibroid patients and vitamin D insufficiency. In our research, we administered 50,000 IU of vitamin D, 500 mg of tranexamic acid, and 10mg of Dydrogesterone orally. During our trial period, the intervention promotes the decrease of excessive vaginal bleeding in leiomyoma among women with mild to severe symptoms. This study suggested that vitamin D supplements can minimize severe vaginal bleeding caused by uterine fibroid. In women bearing uterine fibroids with mild to moderate symptoms, a 40-week vitamin D supplement is adequate. It is a noninvasive agent and a safe acceptable way of innovative therapy.

Limitation of Study:

This investigation was carried out in a tertiary care hospital rather than a traditional government hospital. As a result, the findings of this interventional trial may not apply to a large population

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