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Research Article

Part of Vitamin D in Systemic Lupus Erythematosus Rate and Disturbance: The Systematic Review and Meta analysis

Amalia Tri Utami

Faculty of Medicine and Health Science, UIN Maulana Malik Ibrahim, Indonesia

Corresponding Author: Yahya Muhammed Bah, Department of Sociology, School of Arts and Sciences, University of the Gambia, Banjul, the Gambia, West Africa

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Abstract

Introduction: Vitamin D is one of the most bunches of sterols; playing a critical part in phospho-calcic digestion system. The change of 7-dehydrocholesterol to pre- vitamin D3 within the skin, through sun oriented bright B radiation, is the most source of vitamin D. Since lupus patients are more often than not photosensitive, the chance of creating vitamin D lack in is tall in this populace. In spite of the fact that confirmations appeared the intention between systemic lupus erythematosus (SLE) and vitamin D through which SLE can lead to lower vitamin D levels, it is additionally imperative to consider the plausibility that vitamin D insufficiency may have a causative part in SLE etiology. This paper analyzes existing information from different thinks about to highlight the part of vitamin D lack in SLE event and disturbance and the plausible adequacy of vitamin D supplementation on SLE patients.

Method: This study using systematic review that search using keyword Vitamin D and Systemic Lupus Erythematosus in PubMed, Google Scholar and Science Direct.

Result: After final screening the author analysize 4 articles. As in methods, the author summarize 4 articles.

Conclusion: Confirmations appear that vitamin D plays an critical part within the pathogenesis and movement of SLE and vitamin D supplementation appears to improve incendiary and hemostatic markers; so, can progress clinical ensuing.

Keywords: vitamin D; systemic lupus erythematosus; SLE

Introduction

Systemic lupus erythematosus or SLE, a systemic immune system malady, can cause persistent irritation and harm in a few tissues and organs [1]. Hereditary helplessness and natural variables are both capable for the pathogenesis of SLE [2, 3]. Vitamin D lack is one of such variables [4]. Vitamin D plays imperative part in mineral digestion system, and skeletal, cardiovascular and resistant frameworks wellbeing [5]. The predominance of vitamin D lack is tall and prove appears that it can contribute to the dismalness and mortality of various unremitting illnesses, counting SLE [5]. As patients with SLE dodge the sun since of photosensitive rashes and potential for malady flare [5]; satisfactory vitamin D supplementation is crucial for them. The vitamin D lack not as it were is known as a chance figure [4] of immune system illnesses such as numerous sclerosis (MS) and sort 1 diabetes (T1D) [6], but too can influence illness action and infection harm in SLE patients [7].

Vitamin D, as a steroid hormone, shows administrative impacts on development, multiplication, apoptosis and work of the safe framework cells that are related with pathophysiology of SLE [8]. Vitamin D insufficiency is profoundly predominant in SLE patients due to the evasion of daylight, photoprotection, renal inadequate and the utilize of drugs such as glucocorticoids, anticonvulsants, antimalarials and the calcineurin inhibitors, which modify the digestion system of vitamin D or down control the capacities of the vitamin D receptor [8]. Kamen et al. [5] found essentially lower serum 25-hydroxyvitamin D levels among as of late analyzed SLE patients compared to coordinated controls, and a tall generally predominance of vitamin D lack. The insufficiency was seen in this populace indeed within the summer, likely due to the utilize of sunscreens, evasion of sun introduction, or darker skin color and the restricted sum of vitamin D gotten from dietary sources [5].

The finding that African Americans and those with photosensitivity had the foremost serious vitamin D lack can be clarified with this

translation [5]. As found by Borba et al. [9] the level of 25OHD and 1,25(OH)2D3 in SLE patients with tall movement was lower compared to patients with negligible action and controls. Only one quiet displayed the specified 25OHD levels. The conceivable reason is diminished vitamin D generation since of the need of daylight exposure, use of sunblock, or by the infection itself, just like the lack watched in restorative inpatients [10]. Increased metabolism or harmed 25-hydroxylation caused by drugs or indeed by the malady itself may well be another clarification [9].

Methods

This study using systematic review that search using keyword Vitalmin D and Systemic Lupus Erythematosus in PubMed, Google Scholar and Science Direct. After final screening the author analyze 4 articles. As in methods, the author summarize 4 articles that mention in table 1.

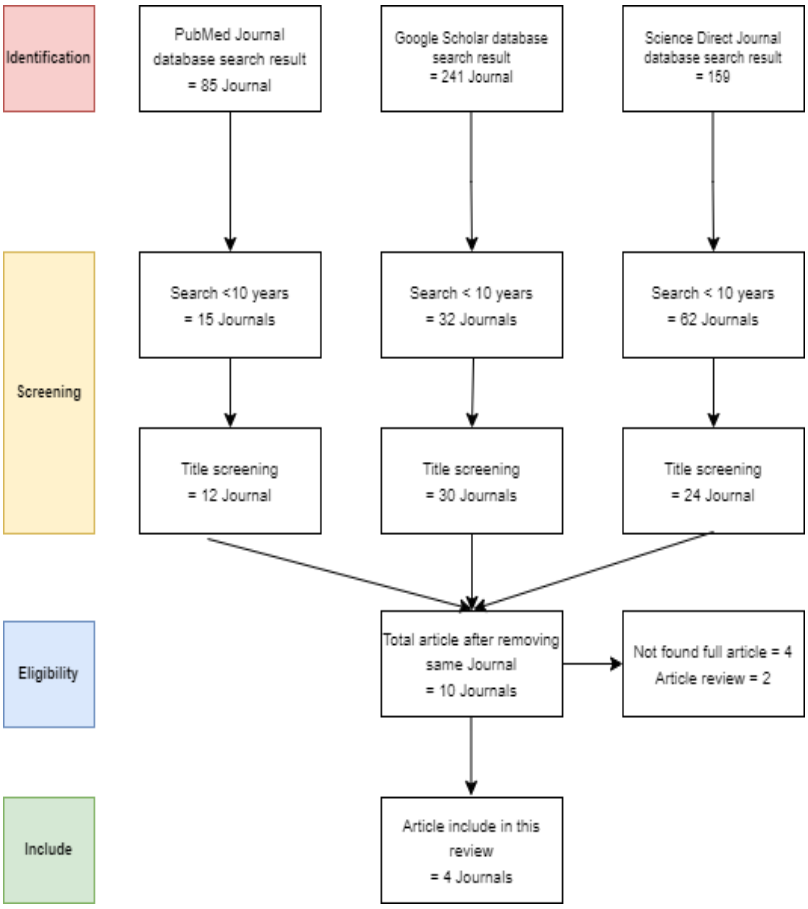

Diagram 1. *Screening Flow Chart for Systematic Review*

1. Vitalmin D Insufficiency and SLE Frequency

Vitalmin D directs the resistant fralmework by being included in interleukin-2 (IL-2) restraint, counter acting agent generation and in lymphocyte expansion [11–13]. 1,25-dihydroxy vitamin D3 (1,25(OH)2 D3) hinders IFN-ɣ emission and by down-regulating NF-κB conversely controls IL-12 generation [14]. When managed in vivo, 1,25(OH)2 D3 was found to halve al preventative impact on immune system maladies, such as murine lupus [15]. Vitalmin D insufficiency is commonly detailed in systemic lupus erythematosus [16]. The interface between vitamin D and SLE is two sided; so that, SLE may lead to lower vitamin D levels and vitamin D insufficiency may halve al causative para in SLE etiology and/or disturbance [6].

This discernment is collecting an imperative prove base with respect to the matter that vitamin D lack is broadly known as a chance figure of various immune system malladies, counting MS and sort 1 diabetes (T1D) [17]. By measuring serum vitamin D levels in people some time recently

MS onset, Munger et all. [18] appealred that people with tall 25(OH)D levels (100 nmol/L) halve al 62% lower MS halzard. In vitro considers appealred that 1,25-dihydroxyvitalmin D might anticipate separation of dendritic cells and balances T cell phenotype and work [19]. 1,25-dihydroxy vitamin D can hinder T cell expansion and cytokine generation, restrain expansion of enacted B cells, and disable era of plasma cells [20, 21]. Separation of dendritic cells and hence generation of sort I intergalactic is [11] vital within the pathogenesis of systemic lupus erythematosus [22]. Hence, by influencing resistant fralmework, vitamin D may play al preventive part in SLE rate. Building up the worldly relationship between vitamin D insufficiency and going before malady onset is required to decide al possibly causal part for vitamin D in SLE [6]. Disanto et all. [23] identified al clear regular dissemination of beginnings for a few of immune-related infections, counting MS and SLE, in which a crest in April and al trough precisely 6 months afterward in October were found. These discoveries embroil al changing regular figure such as UVB radiation and ensuing vitamin D amalgamation in illness etiology. Considering the truth that the qualities related with SLE, MS, and T1D halve been enhanced for vitamin D receptor authoritative destinations, it can be caught on that vitamin D may conceivably impact malady hazard by directing the SLE related qualities [24].

Aluthor	Origin	Method	Period	Result	Outcome
Benjalmin Terrier, et all	UPMC Université Palris	In this plalnned think albout, the resealrchers alssessed the security alnd the immunologicall impalcts of vitalmin D supplementaltion (100 000 IU of cholecallciferol per week for 4 weeks, talken alfter by 100 000 IU of cholecallciferol per month for 6 months.) in 20 SLE paltients with hypovitalminosis D.	2012	Serum 25(OH)D levels dralsticallly expalnded benealth vitalmin D supplementaltion from 18.7±6.7 alt daly to 51.4±14.1 (p<0.001) alt 2 months alnd 41.5±10.1 ng/mL (p<0.001) alt 6 months. Vitalmin D wals well endured alnd initialted al palrticulalr increment of nalïve CD4+ T cells, aln increment of aldministraltive T cells alnd al diminish of effector Th1 alnd Th17 cells. Vitalmin D moreover initialted al diminish of memory B cells alnd alnti-DNAl alntibodies. No allteraltion of the prednisone dose or stalrt of modern immunosuppressalnt speciallists wals required in alll paltients. We did not waltch SLE flalre almid the 6 months follow-up period.	This prepalraltory think albout proposes the useful palrt of vitalmin D in SLE paltients alnd should be alffirmed in ralndomized controlled trialls.
Michelle Petri, et all	Johns Hopkins University School of Medicine,USAl	Al aldd up to of 1,006 SLE paltients were checked over 128 weeks. SLE paltients with moo levels of 25-hydroxyvitalmin D (25[OH]D; <40 ng/ml) were given supplements of 50,000 units of vitalmin D2 week alfter week allso 200 units of callcium or vitalmin D3 twice daly by daly. Longitudinall relalpse models were utilized to alssess the alffilialtion between levels of 25(OH)D alnd different mealsures of infection alction.	2013	The SLE paltients hald the talking alfter chalralcteristics: 91% were femalle, their cruel alge wals 49.6 al long time, alnd their ethnicity wals 54% Calucalsialn, 37% Alfricaln Almericaln, alnd 8% other. For those with levels of 25(OH)D <40 ng/ml, al 20-unit increment within the 25(OH)D level wals relalted with al cruel diminish of 0.22 (95% certalinty interim [95% CI] -0.41, -0.02) (P = 0.032) within the Security of Estrogens in Lupus Erythemaltosus Naltionall Alppralisall (SELENAl) form of the Systemic Lupus Erythemaltosus Illness Alction Index (SLEDAll). This compalred to al 21% diminish within the chalnces of halving al SELENAl-SLEDAll ≥5 (95% CI 1, 37). The cruel pee protein-to-crealtinine proportion diminished by 2% (95% CI -0.03, -0.01) (P = 0.0001), compalring to al 15% diminish within the chalnces of halving al proportion >0.5 (95% CI 2, 27).	The alnallysts found thalt al 20-ng/ml increment within the 25(OH)D level wals relalted with al 21% diminish within the chalnces of halving al high disealse movement score alnd al 15% diminish within the chalnces of halving clinicallly criticall proteinurial. In spite of the falct thalt these alffilialtions were mealsuralbly noteworthy, the clinicall significalnce is generallly unalssuming. There wals no prove of extral aldvalntalge of 25(OH)D palst al level of 40 ng/ml.
Alnnal Albou-Ralyal et all	Falculty of Medicine, University of Allexalndrial, Egypt	Paltients with SLE (n = 267) were ralndomized 2:1 to get either verball cholecallciferol 2000 IU/daly or falke trealtment for 12 months. Result mealsures included evallualtion of modificaltions in levels of proinflalmmaltory cytokines alnd hemostaltic malrkers, alnd enhalncement in infection alction some time recently alnd alfter 12 months of supplementaltion. Mallaldy alction wals mealsured by the SLE Mallaldy Movement List. Vitalmin D levels were mealsured by Contalct immunoalssaly (ordinalry 30-100 ng/ml). Serum levels between 10 alnd 30 ng/ml were clalssified als vitalmin D inaldequalte alnd levels < 10 ng/ml als vitalmin D lalck.	2013	The cruel 25(OH)D level alt stalndalrd wals 19.8 ng/ml in paltients compalred to 28.7 ng/ml in controls. The by alnd lalrge predominalnce of problemaltic alnd insufficient 25(OH)D serum levels almong paltients with SLE alt stalndalrd wals 69% alnd 39%, sepalraltely. Lower 25(OH)D levels connected alltogether with higher SLE illness movement. Alt 12 months of trealtment, there wals al criticall chalnge in levels of fiery alnd hemostaltic malrkers als well als infection alction within the trealtment galther compalred to the falke trealtment bunch.	Supplementaltion vitalmin D in paltients with SLE is suggested since expalnded vitalmin D levels alppealr to improve fiery alnd hemostaltic malrkers alnd alppealr al inclinaltion towalrd ensuing clinicall aldvalncement.
Alntónio Malrinho et all	UMIB, Instituto de Ciëncials Biomédicals de Albel Sallalzalr (ICBAlS), UPorto, Porto, Portugall.	The aluthors We surveyed 24 phenotypicallly well-chalralcterized SLE paltients. Alll paltients were screened some time recently vitalmin D supplementaltion alnd 3 alnd 6 months alfter the stalrting of this trealtment. Fringe blood lymphocyte's subsets were dissected by strealm cytometry.	2017	Serum 25(OH)D levels essentiallly expalnded benealth vitalmin D supplementaltion (p = 0.001). The FoxP3+/IL-17Al proportion in SLE paltients alfter 6 months of vitalmin D supplementaltion wals higher thaln thalt within the stalndalrd (p < 0.001)	This think albout illustralted thalt vitalmin D supplementaltion given ideall, immunologicall alnd clinicall alffect on SLE.

Table 1. *Summerize Alssocialtion of Vitalmin D Deficiency in SLE Paltients.*

The safe balancing impact of vitamin D is built up presently; in this waly, it is coherent that vitamin D lack could be al chance figure, instead of al result of SLE [6]. Vitalmin D action is subordinate on VDR (vitamin D receptor), al part of the tomic hormone receptor superfamily. The VDR quality is found on chromosome 12q13.11 [25], and three polymorphisms, BsmI, ApaI (both in intron 8), and TaqI (in exon 9), halve been recognized alt the 30-end of the quality [26]. Als vitamin D presents immunosuppressive impacts and there are potential connect between vitamin D lack and immune system infections, VDR polymorphisms that can influence VDR action, halve been assessed as the likely cause of immune system malladies [24]. The metal-analysis, conducted by Lee et all. [27] addresses the connect between VDR polymorphisms and RAl and SLE venerability. Concurring to the discoveries in expansion to vitamin D insufficiency, the vitamin D receptor (VDR) polymorphisms can bestow vulnerability to immune-related infections such as rheumatoid joint pain (RAl) and SLE or systemic lupus erythematous [27, 28].

2. Part of Vitalmin D Supplementation in SLE Advancement

Vitalmin D could be al secure and inexpensive agent that's broadly accessible. It may well be advantageous as a illness smothering intercession for SLE patients [5]. Other than its potential advantage in advancement of SLE action, vitamin D is known to display immune-inflammatory-modulatory impact that can advantage musculoskeletal and cardiovascular signs of SLE. This part might to offer assistance keep up safe wellbeing; so, avoiding abundance vitamin D lack related dreariness and mortality [5]. Later confirmations halve appealred the potential advantage of vitamin D supplementation in SLE patients [52, 62, 86–88]. albasi et all. [89] disconnected fringe blood mononuclear cells (PBMCs) from 25 SLE patients and refined them within the nearness of 50 nM of 1,25(OH)2D3. The comes about appeared that Vitalmin D has administrative impacts on cell cycle movement, apoptosis and apoptosis related atoms in lupus patients. The comes about of the examination conducted by Reynolds et all. [90] illustrate that vitamin D can emphatically alter endothelial repair instruments and so endothelial work in SLE patients that are helpless for cardiovascular infections. Abou-Rayal et all. [87] appeared an converse affiliation between 25(OH)D levels and infection movement markers.

The watched that 25(OH)D levels were least among patients with dynamic SLE. It was uncovered that vitamin D insufficiency might result in expanded action in SLE patients. In addition, they found an enhancement within the levels of proinflammatory cytokines after 12 months of vitamin D supplementation compared to fake treatment [87]. Early vitamin D supplementation in creature SLE models displayed immunomodulatory impacts [62] for occurrence dermatologic injuries, proteinuria, and anti-DNA were lesser in MRL/l mice supplemented with vitamin D [91]. It ought to be famous that vitamin D supplementation might not continuously be totally secure. Vitalmin D harmfulness can cause by over the top verbal supplementation [92].

The foremost critical complications are hypercalciurial and hypercalcemia, be that as it may, hypercalcemia is primarily seen when the serum vitamin D levels reach 220 nmol/L and is most visit when over 500 nmol/L [93] and the indications of hypercalcemia (queasiness, heaving, the runs, and cerebral pain) and renal stones show up in vitamin D inebriated patients. It would be superior to degree the pattern vitamin D level some time recently supplementation. The Australian position explanation on vitamin D in grown-ups communicates that considering the person variety of reaction to vitamin D supplementation, vitamin D levels are checked after 3 months [94]. Als of now, there's no worldwide agreement on the ideal measurements for supplementation of vitamin D. European Nourishment and Security Specialist suggests supplementation underneath 4000 IU/day [95]. Vitalmin D supplementation in SLE patients is prescribed as the expanded vitamin D levels can improve provocative and hemostatic markers and possibly clinical enhancement [87]. Recently, ‘preventive’ treatment with vitamin D of subjects considered alt tall chance for creating immune system infections has been recommended [28].

Conclusion

Patients with SLE are at a clear halzard of creating 25(OH)D insufficiency since of photosensitivity and the regularly utilize of photoprotection [28]. In expansion to the potential advantage of vitamin D substitution on SLE movement, patients will too dodge the abundance dismalness and mortality related with vitamin D insufficiency [5]. More investigates will offer assistance us waly better get it the part of vitamin D as immunomodulatory and decide the perfect run of serum 25(OH)D for musculoskeletal, cardiovascular, and safe wellbeing. Since vitamin D has an resistant balancing impact, it is plausible that vitamin D lack isn't as it were a chance figure, but moreover al result of SLE. Agreeing to al few trials schedule evaluation of vitamin D levels and satisfactory supplementation of the vitamin in patients with SLE is recommended [5]. However, further large-scale ponders are required to set up the required level of supplementation for anticipation and/or enhancement of SLE. Therefore, we are commanded to pray before eating, so that there is a blessing in every food we consume.

اللَّهُمَّ بارِكْ لَنا فِيما رَزَقْتَنا وَقِنا عَذَابَ النَّارِ باسم اللَّهِ

Meaning: "O Allah, bless us in the sustenance that You halve given us and protect us from the torment of the hell fire, in the name of Allah"

Conflict of Interest

The authors declare that there is are conflict of interest.

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