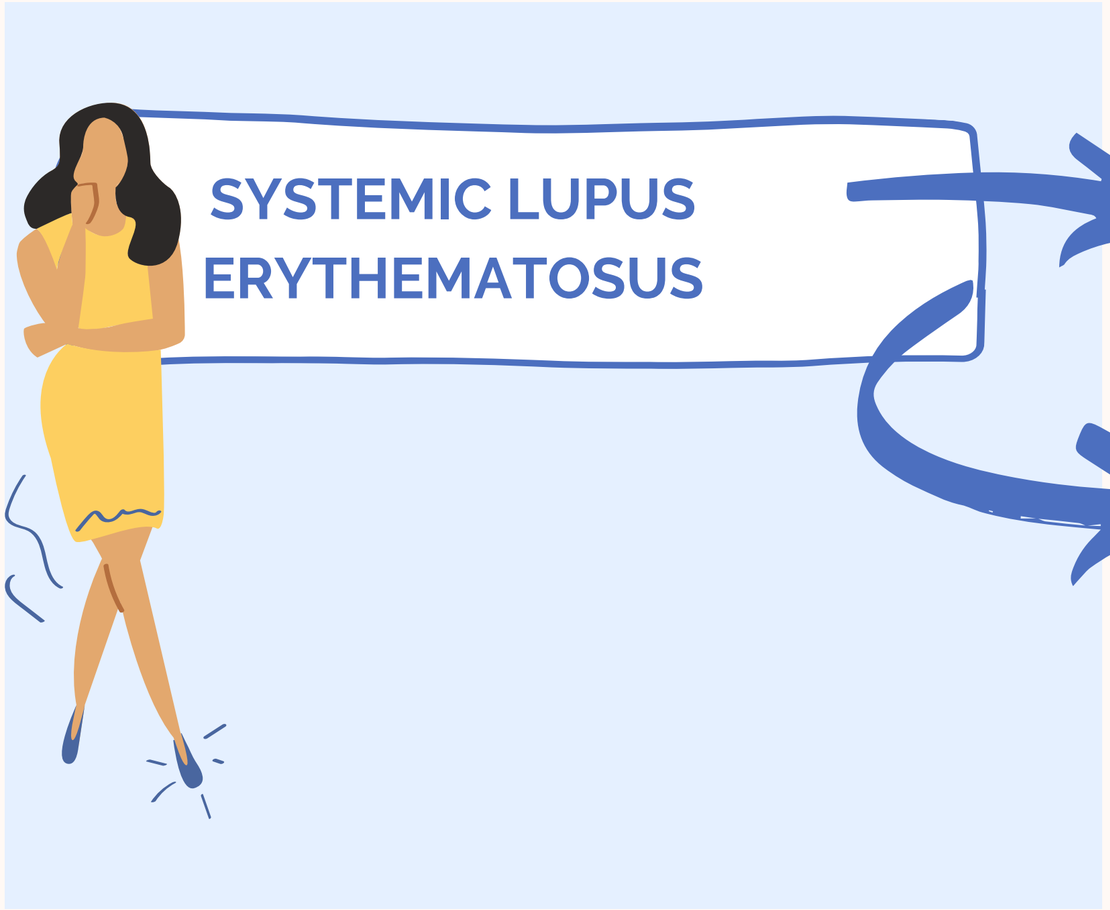
Vitamin D supplementation is associated with disease activity in system lupus erythematosus patients

The 1st International Electronic Conference on Nutrients - Nutritional and Microbiota Effects on Chronic Diseas

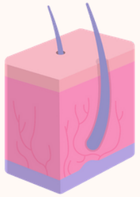
María Correa-Rodríguez, Gabriela Pocovi-Gerardino, Irene Medina-Martínez, Sara Del Olmo-Romero, Norberto Ortego-Centeno, Blanca Rueda-Medina

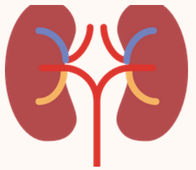
INTRODUCTION



Systemic **AUTOIMMUNE** disease characterized by the presence of autoantibodies directed against nuclear antigens.

Multisystem disease.
Heterogenous clinical manifestation including rash, arthritis, fatigue, nephritis, neurological problems, anemia and thrombocytopenia.





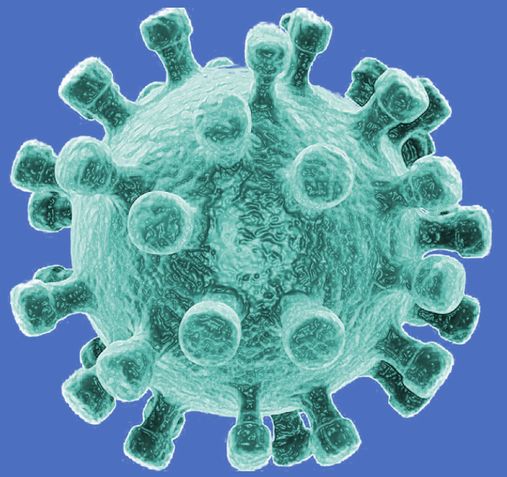
Fava, A.; Petri, M. Systemic lupus erythematosus: Diagnosis and clinical management. J Autoimmun 2019, 96, 1–13.

OBJECTIVE

Investigate the relationship between the dietary intake of vitamin D and supplementation of vitamin D and SLE disease in a cohort of patients with SLE.

- GENETIC
- INMUNOLOGICAL
- ENDOCRINAL
- ENVIROMENTAL

The AETIOLOGY of SLE is unknown. It has proposed that multiple factors might play a main role in development and activity



Rekvig, O. P. Systemic lupus erythematosus: Definitions, contexts, conflicts, enigmas. Front Immunol 2018, 9, 1, doi:10.3389/fimmu.2018.00387.

VITAMIN D

- Essential in **phosphorus-calcium metabolism** and it has **inmmunosupressive properties**

  Therapeutic option in AUTOINMMUNE diseases

- Vitamin D deficiency is high prevalence in SLE patients.
  Vitamin D intake might be liked to SLE.

- Vitamin D intake was found to be associated with decreased risk of other autoimmune diseases such as multiple sclerosis.

Yang, C. Y.; Leung, P. S. C.; Adamopoulos, I. E.; Gershwin, M. E. The implication of vitamin D and autoimmunity: A comprehensive review. Clin Rev Allergy Immunol 2013, 45, 217–226.

Hassanalilou, T.; Khalili, L.; Ghavamzadeh, S.; Shokri, A.; Payahoo, L.; Bishak, Y. K. Role of vitamin D deficiency in systemic lupus erythematosus incidence and aggravation. Autoimmun Highlights 2018, 9, 1–10,

Costenbader, K. H.; Feskanich, D.; Holmes, M.; Karlson, E. W.; Benito-Garcia, E. Vitamin D intake and risks of systemic lupus erythematosus and rheumatoid arthritis in women. Ann Rheum Dis 2008, 67, 530–535

Munger, K. L.; Zhang, S. M.; O'Reilly, E.; Hernán, M. A.; Olek, M. J.; Willett, W. C.; Ascherio, A. Vitamin D intake and incidence of multiple sclerosis. Neurology 2004, 62, 60–65.

METHODS

Cross-sectional study

258 patients SLE
Andalusian region of Spain

All statistical analyses were conducted using the SPPS Statistics version 21.0 software

METHODS

INCLUSION CRITERIA

SLE revised criteria

- American College of Rheumatology (ACR)
- Systemic Lupus Erythematosus International Collaborating Clinics Group (SLICC) criteria

METHODS

EXCLUSION CRITERIA

- Kidney involvement
- Cerebrovascular disease, ischemic heart disease
- Active infections
- Major trauma or surgery in the previous six months
- Pregnancy
- Presence of other autoimmune and/or chronic diseases not related with SLE

METHODS

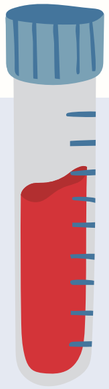
VARIABLES

CARACTERISTICS

Gender, age, energy (kcal), vitamin D intake

CLINICAL DATA

Time since diagnosis (years), number of complications, SLEDAI score, SDI score



LABORATORY MARKERS

hsCRP, Hcy, Anti-dsDNA, complement C3 and C4 levels.

MEDICATION USED

Vitamin D supplementation, antimalarial use, immunosuppressor use, corticoid use

RESULTS

Table 1. Descriptive of the main characteristics the study population

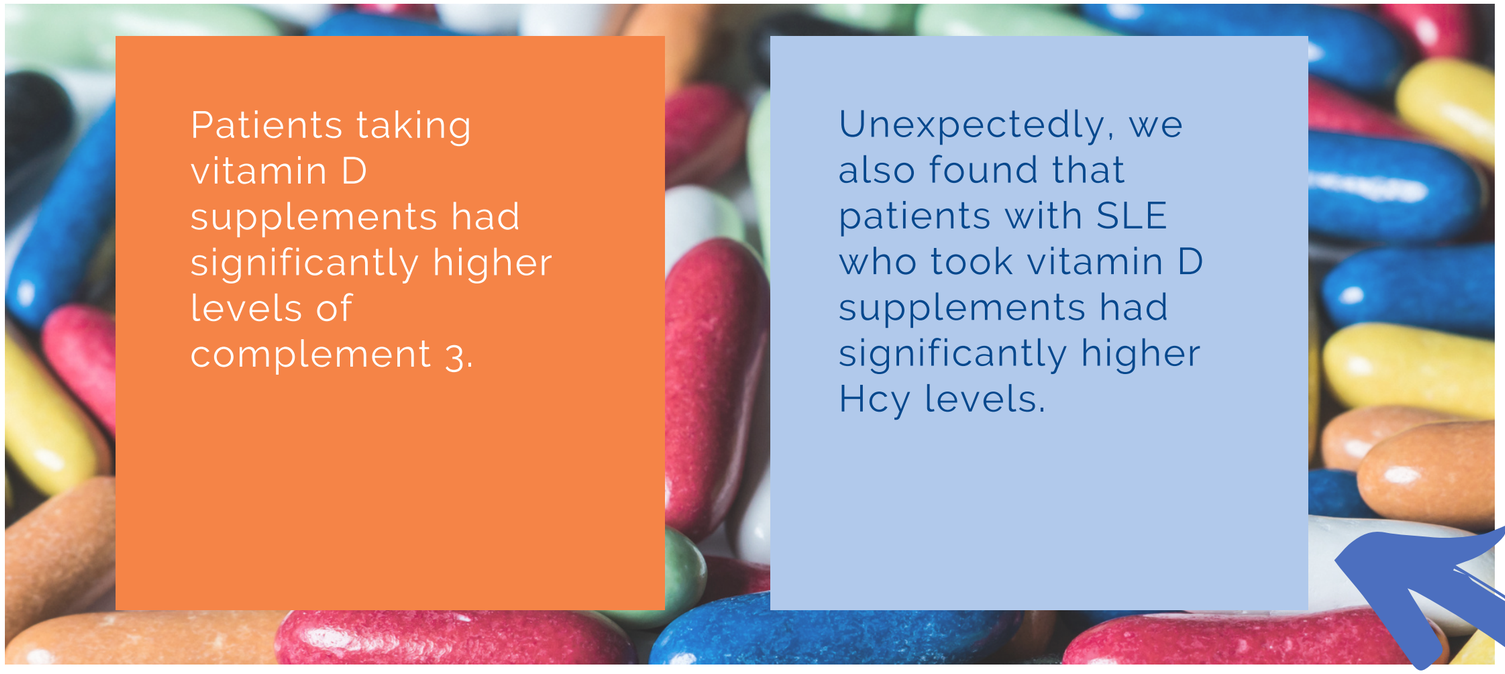
Characteristics	Total (n=193)
Female	248 (90.5)
Age (years)	46.99±12.89
Energy (kcal)	1775.03±507.69
Vitamin D intake (µg)	2.08±2.94
Clinical data	
Time since diagnosis (years)	9.11±6.64
Number of complications	3.38±1.34
SLEDAI[a] score	2.65±2.68
SDI score	0.97±1.23
Laboratory markers	
hsCRP (mg/dL)	3.17±4.81
Hcy (μmol/L)	12.48±7.45
Anti-dsDNA (IU/mL)	18.37±37.09
Complement C3 level (mg/dL)	109.17±28.25
Complement C4 level (mg/dL)	22.81±13.56
Medication used	
Vitamin D supplementation	156 (57.1%)
Antimalarial use	217 (79.5)
Immunosuppressor use	102 (37.4)
Corticoid use	108 (39.6)

RESULTS

Table 2. Beta estimates and confidence intervals fo e association between vitamin D intake, vitamin D supplementation and clinical disease activity parameters in SLE patients

	Vitamin D intake (µg)		**Vitamin D supplementation**		
Clinical parameters	β (95% CI)	*p* value	**Yes (n=156)**	**No (n=117)**	**P value**
Number of complications	0.004 (-0.049, 0.056)	0.895	3.53±1.44	3.17±1.18	0.922
SLEDAI score	0.015 (-0.092, 0.121)	0.784	2.68 ± 2.85	2.57 ± 2.40	0.229
SDI score	0.012 (-0.036, 0.060)	0.623	1.19 ± 1.35	0.66 ± 0.96	0.123
hsCRP (mg/dL)	-0.108 (-0.301, 0.086)	0.274	3.76 ± 5.54	2.29 ± 3.37	0.238
Hcy (µmol/L)	0.339 (-0.052. 0.731)	0.089	13.66 ± 9.50	11.05 ± 3.18	**0.016**
Anti-dsDNA (IU/mL)	0.493 (-1.013, 1.999)	0.520	21.33 ± 43.41	14.54 ± 26.12	0.938
Complement C3 level (mg/dL)	-0.759 (-1.869, 0.351)	0.180	110.28 ± 30.93	107.38 ± 24.18	**0.018**
Complement C4 level (mg/dL)	-0.433 (-1.128. 0.261)	0.220	22.53 ± 12.94	23.16 ± 21.41	0.894

DISCUSSION



Patients taking vitamin D supplements had significantly higher levels of complement 3.

Unexpectedly, we also found that patients with SLE who took vitamin D supplements had significantly higher Hcy levels.

Well-characterised cohort of population with SLE, including patients in a early-stage of the disease and excluding any with lupus severe complications or affected by other autoimmune diseases.

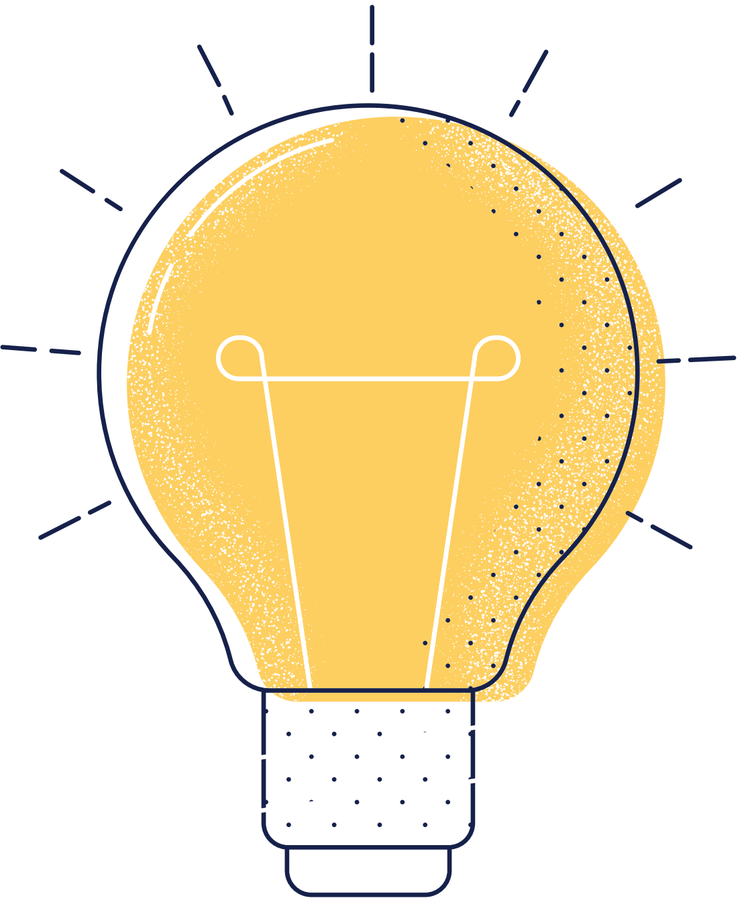
In contrast to our results, Mellor Pita et al reported no association between vitamin D supplement intake and SLE-related factors including Hcy in 46 females with SLE.
Constenbader et al conclude that vitamin D intake was not associated with risk od SLE in a large prospective cohort of women .

LIMITATIONS

Cross-sectional study, was subject to the limitations inherent to this type of design.

Use of the 24 hour diet recall technique because it is prone to under-reporting and relies on participant memory.

CONCLUSION



Patients taking vitamin D supplements had significantly higher levels of complement 3, supporting the potential effect of supplementation of vitamin D on the activity of SLE

The dietary intake of vitamin D are not associated with clinical and laboratory variables in women with SLE

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