

## VITAMIN D STATUS IN EGYPTIAN PATIENTS WITH PSORIATIC ARTHRITIS AND ITS RELATIONSHIP WITH THE DISEASE ACTIVITY AND SEVERITY.

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### ABSTRACT:

**Background:** Many studies proved high percentage of vitamin D deficiency in psoriatic arthritis patients. Different records about the possible link between vitamin D deficiency and state of inflammatory & disease activity in psoriatic arthritis patients)

**Aim of the work:** To evaluate the vitamin D level in Egyptian patients with psoriatic arthritis and its association with activity of the disease as well as disease severity

**Patients & Method:** 45 Psoriatic Arthritis Patients fulfilled the Classification Criteria for the diagnosis of Psoriatic Arthritis (CASPAR) and 50 healthy controls were included. Medical history was taken, general and musculoskeletal examination were done. Disease activity was assessed using the Disease activity in psoriatic arthritis "DAPSA" score. VAS, HAQ, ESR & CRP were done. Serum level of 25(OH) vitamin D was measured by ELISA for patients and controls.

**Results:** Serum vitamin D level in psoriatic arthritis patients ranged from 10-48 ng/mL, with mean  $\pm$ SD 32.844 $\pm$ 12.395. While in healthy controls it ranged from 15-50 ng/mL with mean  $\pm$ SD 33.940 $\pm$ 8.998, without statistical significant difference. Vitamin D deficiency was detected in 12 patients (26.6%) and 5 (10%) healthy participants with statistically significant higher frequency of vitamin D deficiency in patients than controls ( $P$ -value  $<0.034$ ). patients with vitamin D deficiency showed statistically significant longer disease duration, higher VAS, HAQ score, ESR, CRP titer and DAPSA score ( $P$ -value  $<0.001$ ). Also, they had statistically significant higher frequency of axial affection ( $P$ -value  $<0.001$ ). Vitamin D level was statistically negatively correlated with disease duration, VAS, HAQ, ESR, CRP and DAPSA score ( $P$ -value  $<0.001$ ).

**Conclusions:** We concluded that psoriatic arthritis patients had higher frequency of vitamin D deficiency than healthy individuals. And that patients with vitamin D deficiency had more active and more severe disease compared to those without deficiency.

**Keywords:** Vitamin D, psoriatic arthritis, disease activity

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### INTRODUCTION:

Psoriatic arthritis (PsA) is a chronic autoimmune disease manifested by arthritis, enthesitis, dactylitis, skin lesions and axial affection<sup>1,2,3</sup>.

Lower vitamin D level was related to autoimmune diseases<sup>4</sup>. Vitamin D appears to affect the immune system response, it prevents the production of some cytokines (interleukin 1, interleukin 6, interleukin 12, Tumor Necrosis Factor - $\alpha$ ), and suppress the

T helper 1 cells production of interleukin 2<sup>5&6</sup>. In fact, vitamin D had immunomodulating, anti-inflammatory, antifibrotic and anti-oxidant effects<sup>7</sup>.

Many previous studies proved high incidence of vitamin D deficiency in psoriatic arthritis patients<sup>8&9</sup>. Different records about the probable relationship between vitamin D deficiency and inflammatory status & disease activity in psoriatic arthritis<sup>10</sup>.

Several studies proved higher frequency of vitamin D deficiency in psoriatic arthritis patients and its relation with the disease activity and severity, while other many studies didn't found that. So, we found that was an interesting research subject to investigate.

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### **AIM OF THE WORK:**

To evaluate the vitamin D level in Egyptian patients with psoriatic arthritis and its association with activity of the disease as well as disease severity

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### **PATIENTS & METHODS:**

Ninety five individuals participated in this cross sectional study. Forty five of them were diagnosed as psoriatic arthritis and fulfilled the Classification criteria for the diagnosis of Psoriatic Arthritis (CASPAR)<sup>11</sup>. Patients were treated in internal medicine and Rheumatology clinics, Ain Shams University hospitals. Patients on vitamin D supplements were excluded. Another fifty healthy age and sex matched individuals participated as control group.

All participants gave an informed consent after explaining the purposes and the methodology of the study.

### **Ethical consideration:**

Ethical approval was obtained from Ethical Committee of Scientific Research, Faculty of Medicine, Ain Shams University (FWA000017585 FMASU R 114/2023).

Detailed medical history was taken from all patients. General and musculoskeletal examination were done. Assessment of the disease activity was done using the Disease activity in psoriatic arthritis DAPSA score<sup>12</sup>. Presence of axial affection (proved by MRI) was recorded. Assessment of pain intensity using the 0–10 visual analogue scale (VAS) as 0 = no pain; 10 = intense pain, and functional ability using health assessment questionnaire (HAQ) score was done as score less than 0.5 considered normal while score more than 1.5 considered severe disability<sup>13</sup>. Inflammatory markers were done included erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) titer.

Serum level of 25(OH) vitamin D was measured by ELISA for patients and controls. Results were interpreted as follows: deficiency (0–20 ng/mL); insufficiency (21–30 ng/mL); sufficiency (31–80 ng/mL)<sup>14</sup>. Comparison between patients and controls regarding vitamin D level was done. Patients were divided according to the serum level of vitamin D into, group I: patients with vitamin D deficiency and group II: patients without vitamin D deficiency. Comparison between both groups was done regarding demographic data, clinical and laboratory markers. Then vitamin D level was correlated with parameters of disease activity and severity.

Data were coded and entered utilizing the statistical package SPSS version 24. Comparisons between quantitative variables will be done using the nonparametric Kruskal-Wallis and Mann-Whitney tests. For comparing categorical data, chi-square ( $\chi^2$ ) test will be performed.

**RESULTS:**

Table (1): Descriptive data of studied psoriatic arthritis patients.

Patient		N		%
Sex	Male	14		31.11
	Female	31		68.89
Age (years)	Range	18	-	45
	Mean ±SD	31.933	±	7.650
Smoking	Yes	6		13.33
	No	39		86.67
Disease duration (years)	Range	2	-	14
	Mean ±SD	5.578	±	3.368
Axial affection	Yes	8		17.78
	No	37		82.22
VAS	Range	0	-	10
	Mean ±SD	4.289	±	2.744
HAQ	Range	0.2	-	3
	Mean ±SD	0.667	±	0.517
ESR (mm/h)	Range	12	-	70
	Mean ±SD	34.933	±	15.049
CRP (mg/L)	Range	4	-	48
	Mean ±SD	17.000	±	13.509
DAPSA score	Range	2	-	34
	Mean ±SD	11.178	±	9.803

There were 31(68.89%) females and 14 (31.11%) males, their ages ranged from 18 to 45 years with Mean ±SD 31.933 ± 7.650. (Tab 1)

Table (2): Comparison between healthy controls and psoriatic arthritis patients regarding vitamin D level.

		Group						T-Test	
		Patient			Control			t	P-value
VIT D (ng/mL)	Range	10	-	48	15	-	50	-0.496	0.621
	Mean ±SD	32.844	±	12.395	33.940	±	8.998		
Chi-Square		N		%		N		%	
VIT D	Deficient	12		26.67		5		10.00	
	Non deficient	33		73.33		45		90.00	
								X <sup>2</sup>	P-value
								4.478	0.034

Serum vitamin D level in psoriatic arthritis patients ranged from 10-48 ng/mL, with mean ±SD 32.844±12.395. While in healthy controls it ranged from 15-50 ng/mL with mean ±SD33.940±8.998, without statistical significant difference. (Tab 2)

Vitamin D deficiency was more frequent in patients than controls [12 patients (26.6%) Vs 5(10%)]. This higher frequency had statistical significance (P-value <0.034).(Tab 2)

Table (3): Comparison between patients with vitamin D deficiency and patients without vitamin D deficiency.

Patient		VIT D						T-Test	
		With deficiency			Without deficiency			t	P-value
Age(years)	Range	23	-	44	18	-	45	0.915	0.365
	Mean ±SD	33.667	±	7.572	31.303	±	7.695		
Disease duration (years)	Range	3	-	14	2	-	12	3.776	<0.001
	Mean ±SD	8.333	±	3.257	4.576	±	2.840		
VAS	Range	6	-	10	0	-	6	8.939	<0.001
	Mean ±SD	7.917	±	1.311	2.970	±	1.741		
HAQ	Range	0.9	-	1.6	0.2	-	3	4.669	<0.001
	Mean ±SD	1.158	±	0.202	0.488	±	0.479		
ESR (mm/h)	Range	39	-	70	12	-	51	6.978	<0.001
	Mean ±SD	52.917	±	10.808	28.394	±	10.289		
CRP (mg/L)	Range	28	-	48	4	-	20	21.242	<0.001
	Mean ±SD	38.167	±	5.875	9.303	±	3.157		
DAPSA score	Range	16	-	34	2	-	14	12.514	<0.001
	Mean ±SD	25.417	±	5.915	6.000	±	4.054		
Chi-Square		N		%	N		%	X <sup>2</sup>	P-value
Sex	Male	2		16.67	12		36.36	1.593	0.207
	Female	10		83.33	21		63.64		
Smoking	Yes	1		8.33	5		15.15	0.354	0.552
	No	11		91.67	28		84.85		
Axial affection	Yes	8		66.67	0		0.00	26.757	<0.001
	No	4		33.33	33		100.00		

Comparison between patients with vitamin D deficiency and those without vitamin D deficiency showed statistically significant longer disease duration, higher VAS, HAQ score, ESR, CRP titer and DAPSA score (P-value <0.001) in patients with vitamin D deficiency. Also they had statistically significant higher frequency of axial affection (P-value <0.001). (Tab 3)

Table (4): Correlation between vitamin D level and parameters of disease severity and activity in psoriatic arthritis patients.

	VIT D	
	r	P-value
Disease duration	-0.571	<0.001
VAS	-0.920	<0.001
HAQ	-0.524	<0.001
ESR (mm/h)	-0.829	<0.001
CRP (mg/L)	-0.934	<0.001
DAPSA score	-0.935	<0.001

Vitamin D level was statistically negatively correlated with disease duration, VAS, HAQ, ESR, CRP and DAPSA score (P-value <0.001). (Tab 4).

## DISCUSSION:

Frequency of vitamin D deficiency in PSA and its relationship with the inflammatory status and activity is an interesting topic to investigate, so current study was designed to assess level of vitamin D in Egyptian patients with PSA and its

association with activity of the disease as well as disease severity

In current study there was female predominance in our psoriatic arthritis patients as there were 31 females (68.89%) and 14 males (31.11%). These results are consistent with **El Helaly et al.**<sup>10</sup> who found that there was female sex predilection in

psoriatic arthritis. While disagree with **Vekić Mužević et al.**<sup>15</sup> who didn't observe that.

In our psoriatic arthritis patients, serum vitamin D level ranged from 10-48 ng/mL, with mean  $\pm$ SD 32.844 $\pm$ 12.395. Twelve patients (26.6%) were deficient. These findings are partially agree with those of **Urruticochea-Arana et al.**<sup>16</sup> who observed that vitamin D level in psoriatic arthritis patients ranged from 14.0 – 28.8 ng/ml with median 20.0 ng/ml, but they found higher frequency of vitamin D deficiency than our findings as they detected 40.9 % of their patients were deficient.

Our research didn't reveal statistically significant difference between patients and controls regarding vitamin D level that disagree with **Radić et al.**<sup>17</sup> **Mohammed et al.**<sup>18</sup>, **Ibrahim et al.**<sup>19</sup>, **Petho et al.**<sup>20</sup>, and **Touma et al.**<sup>21</sup> who detected lower Vitamin D levels in psoriatic arthritis patients rather than healthy participants. This disagreement could be explained by our small sample size.

Despite the fact that there was no statistically significant difference in vitamin D levels between patients and controls, there was no statistically significant difference between patients and controls regarding vitamin D level, but, there was statistically significant higher frequency of vitamin D deficiency in patients than controls. The same was recorded by **El Tawab et al.**<sup>22</sup> who found that vitamin D level didn't show significant difference in psoriatic arthritis patients and healthy participants and that their healthy participants had lower frequency of vitamin D deficiency than patients with psoriatic arthritis.

Similarly, **Gamonal et al.**<sup>23</sup> found that vitamin D deficiency was more frequently seen in patients with PsA (82.2%).

Vitamin D deficiency in psoriatic arthritis patients could be clarified by many causes such as less exposure to sun, taking drugs that interfere with Vitamin D metabolism like, steroids or

immunosuppressive drugs, and decreased Vitamin D intake **Filoni et al.**<sup>24</sup>. Also, chronic diseases lead to decreased synthesis or increased catabolism of vitamin D **Urruticochea-Arana et al.**<sup>16</sup>

While investigating the relationship of vitamin D with the disease severity, our results revealed that vitamin D deficiency was linked to more severe disease indicated by statistically significant longer disease duration, higher VAS and HAQ score in deficient patients and by presence of statistical negative correlation of vitamin D level with these parameters. Also, presence of higher frequency of axial affection in patients with vitamin D deficiency.

In line, Results of **Mohammed et al.**<sup>18</sup> showed that Vitamin D deficiency was linked to longer disease duration. And **Sag et al.**<sup>25</sup> found that the duration of psoriatic arthritis was inversely correlated with serum Vitamin D level.

In harmony, **Rotondo et al.**<sup>26</sup> noted a high frequency of axial affection in the psoriatic patients with vitamin D deficiency which go hand by hand with **Fernandes et al.**<sup>27</sup> who considered presence of axial affection as indicator of disease severity.

**Kincse et al.**<sup>28</sup> noticed that vitamin D level was significantly linked to the functional ability in psoriatic arthritis that supports our findings. While **Montolio-Chiva et al.**<sup>29</sup> didn't observe any relationship between vitamin D and HAQ score.

The link between VAS and vitamin D come in agreement with the theory of the relationship between vitamin D deficiency and musculoskeletal pain **Plotnikoff et al.**<sup>30</sup>. Also it may be due to the higher disease activity in the deficient patients.

Vitamin D level may be correlated with disease activity and inflammatory markers **Deng et al.**<sup>31</sup>, **Zhao et al.**<sup>32</sup> and **Cai et al.**<sup>33</sup>. In current study, vitamin D deficiency was linked to more active disease as we found that inflammatory markers and DAPSA score

were significantly higher in patients with vitamin D deficiency (P-value <0.001), also same parameters were negatively correlated with vitamin D level (P-value <0.001).

Our results agree with **Kincse et al.**<sup>28</sup> who confirmed negative correlation between serum vitamin D and DAPSA score in psoriatic arthritis. And **El Helaly et al.**<sup>10</sup> who found that patients with high CRP showed lower levels of vitamin D.

**Montolio-Chiva et al.**<sup>29</sup> observed inverse correlation between vitamin D level and number of tender joint and swollen joint and that patients with vitamin D deficiency had higher DAPSA score. On the other hand **Braun-Moscovici et al.**<sup>34</sup> didn't found Vitamin D to be correlated with disease activity scoring in psoriatic arthritis.

Furthermore, our results agree with **Mohammed et al.**<sup>18</sup> who found that Vitamin D level is lower in psoriatic arthritis with high disease activity score.

Our findings support those of **Pavlov et al.**<sup>35</sup> who found that vitamin D was significantly correlated with CRP and reported that vitamin D deficiency may be used as indicator of more active disease.

Current results partially agree with those of **El Helaly et al.**<sup>10</sup> and **El Tawab et al.**<sup>22</sup> who observed that vitamin D deficiency was frequent in psoriatic arthritis patients. However, they did not correlate vitamin D deficiency with the activity or severity in their patients.

On the contrary, **Rotondo et al.**<sup>26</sup> showed that vitamin D level was not correlated with inflammatory markers, furthermore, **Ibrahim et al.**<sup>19</sup> and **Sag et al.**<sup>25</sup> reported that vitamin D level was not correlated with CRP.

This study had some limitations such as being a single center study and small sample size and absence of follow up of deficient patients after giving vitamin D supplements.

This study had some limitations, including the fact that it was conducted in a single center with small sample size, and the lack of follow-up with patients who were vitamin D deficient after receiving supplements.

## **Conclusions:**

Finally we concluded that psoriatic arthritis patients had higher frequency of vitamin D deficiency than healthy individuals. And that patients with vitamin D deficiency had more severe and more active disease compared to those without deficiency.

## **Disclosure and Conflict of Interest:**

**Competing interests:** The authors declare that they have no competing interests concerning this article.

**Ethical approval:** All procedures performed in the study were in accordance with the ethical standards of the faculty of medicine, Ain Shams university research and ethical committee. We obtained approval from Research Ethics Committee (REC) No. FWA 000017585. FMASU R 114/2023, On 1/5/2023. Written informed consent was obtained from participants for participation in this study.

The FMASU REC is organized and operated according to guidelines of the International Council on Harmonization (ICH) and the Islamic Organization of Medical Sciences (IOMS), the United States Office for Human research Protections and the United States Code of Feral Regulations and operates under Federal Wide Assurance No. FWA 000017585. FMASU R 114/2023.

**Consent for publication:** Not applicable due to patients' privacy concern.

**Availability of data and materials:** The datasets generated and/or analyzed during this study are not publicly available due to patients' privacy, but are available from the corresponding author on reasonable request.

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**Authors contributions:**

All authors have participated in the concept, design, collect, analysis and interpretation of data, writing, drafting and revising the manuscript. FM: recruited patients, carried out clinical examination and assessment, and generated the result sheets. MAZ: underwent data tabulation and statistical analysis, and interpreted the patient's data and wrote the final results. MM: recruited patients, carried out clinical examination and assessment, and revised data interpretation and manuscript. NN: was the major contributor in writing and editing the manuscript, designed the protocol, carried out the Ethical approval, and data collection. All authors have agreed to conditions noted on the Authorship Agreement Form and have read and approved the final version submitted. The content of the manuscript has not been published, or submitted for publication elsewhere. All authors read and approved the final manuscript.

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**REFERENCES:**

1. **Rotondo C, Cici D and Cantatore FP.** Growth factors: Do they play a role in enthesal involvement in psoriatic arthritis and undifferentiated spondyloarthritis patients? *Reumatol Clin (Engl Ed)*. 2021; 17(6):369-370. doi: 10.1016/j.reuma.2020.01.002.
2. **Chimenti MS, Caso F, Alivernini S, De Martino E, Costa L, Toluoso B, et al.** Amplifying the concept of psoriatic arthritis: The role of autoimmunity in systemic psoriatic disease. *Autoimmun Rev*. 2019; 18(6):565-575. doi: 10.1016/j.autrev.2018.11.007. Epub 2019. PMID: 30959209.
3. **Rotondo C, Corrado A, Cici D, Berardi S, Cantatore FP.** Anti-cyclic-citrullinated-protein-antibodies in psoriatic arthritis patients: how autoimmune dysregulation could affect clinical characteristics, retention rate of methotrexate monotherapy and first line biotechnological drug survival. A single center retrospective study. *Ther Adv Chronic Dis*. 2021; 12:2040622320986722. doi: 10.1177/2040622320986722. PMID: 33796242; PMCID: PMC7970688.
4. **Murdaca G, Tonacci A, Negrini S, Greco M, Borro M, Puppo F, Gangemi S.** Emerging role of vitamin D in autoimmune diseases: An update on evidence and therapeutic implications. *Autoimmun Rev*. 2019; 18(9):102350. doi: 10.1016/j.autrev.2019.102350. Epub 2019. PMID: 31323357.
5. **Verway M.** Vitamin D Induces Interleukin-1 $\beta$  Expression: Paracrine Macrophage Epithelial Signaling Controls M. Tuberculosis Infection. *PLoS Pathog*. 2013; 9:e1003407.
6. **Khoo AL, Chai LY, Koenen HJ, Oosting M, Steinmeyer A, Zuegel U, et al.** Vitamin D (3) down-regulates proinflammatory cytokine response to Mycobacterium tuberculosis through pattern recognition receptors while inducing protective cathelicidin production. *Cytokine*. 2011; 55(2):294-300. doi: 10.1016/j.cyto.2011.04.016. Epub 2011 May 17. PMID: 21592820.
7. **Orgaz-Molina J, Buendía-Eisman A, Arrabal-Polo MA, Ruiz JC, Arias-Santiago S.** Deficiency of serum concentration of 25-hydroxyvitamin D in psoriatic patients: a case-control study. *J Am Acad Dermatol*. 2012; 67(5):931-8.

- doi: 10.1016/j.jaad.2012.01.040. Epub 2012. PMID: 22387034.
8. **Zhao SZ, Thong D, Duffield S, Goodson N.** Vitamin D Deficiency in Axial Spondyloarthritis is Associated with Higher Disease Activity. *Arch. Rheumatol.* 2017; 32:209–215.
  9. **Gula Z, Kopczyńska A, Hańska K, Słomski M, Nowakowski J, Kwaśny-Krochin B, et al.** Vitamin D serum concentration is not related to the activity of spondyloarthritis—preliminary study. *Rheumatology.* 2018; 56:388–391.
  10. **Elhelaly MA, El-Ashmawy AEA, Haseeb AA, Abd Allah HG, Abd-Alsamie HS.** Comparative Study of Vitamin D Level between Psoriatic Patients and Psoriatic Arthritis Patients. *The Egyptian Journal of Hospital Medicine* 2018; 72(4), 4300-4307.
  11. **Taylor W, Gladman D, Helliwell P, Marchesoni A, Mease P, Mielants H; CASPAR Study Group.** Classification criteria for psoriatic arthritis: development of new criteria from a large international study. *Arthritis Rheum* 2006; 54(8):2665-73.
  12. **Mulder M, Broeder A, Ginneken B, et al.** Implementing Psoriatic Arthritis Disease Activity Score-guided treat-to-target in psoriatic arthritis routine clinical practice: impossible? *Rheumatology* 2019; 58: 2330-1.
  13. **Fires HF, Spitz PW and Young DY.** The dimensions of health outcomes: The health assessment questionnaire, disability and pain scales. *J. Rheumatol.*1982; 9: 789-93, 1982.
  14. **Chernecky CC and Berger BJ.** Vitamin D (cholecalciferol) -- plasma or serum. In: Chernecky CC, Berger BJ, eds. *Laboratory Tests and Diagnostic Procedures.* 6th ed. St Louis, MO: Elsevier Saunders; 2013:1182-1183.
  15. **Vekić Mužević M, Biljan D, Šola M, Kuric I, Mužević D, Lazić Mosler E.** mineral bone density and vitamin d levels in patients with psoriatic arthritis. *Acta Clin Croat.* 2022; 61(1):70-78. doi: 10.20471/acc.2022.61.01.09. PMID: 36398080; PMCID: PMC9616022.
  16. **Urruticoechea-Arana A, Martín-Martínez MA, Castañeda S, Piedra CA, González-Juanatey C, Llorca J, Díaz-Gonzalez F, González-Gay MA; CARMA Project Collaborative Group.** Vitamin D deficiency in chronic inflammatory rheumatic diseases: results of the cardiovascular in rheumatology [CARMA] study. *Arthritis Res Ther.* 2015; 17(1):211. doi: 10.1186/s13075-015-0704-4. PMID: 26271333; PMCID: PMC4535672.
  17. **Radić M, Đogaš H, Kolak E, Gelemanović A, Nenadić DB, Vučković M, Radić J.** Vitamin D in psoriatic arthritis – A systematic review and meta-analysis. *Seminars in Arthritis and Rheumatism* 2023 Jun; 60:152200. doi: 10.1016/j.semarthrit.2023.152200.
  18. **Mohammed JQ, Mathkhor AJ, and Khudhairy AS.** “Vitamin d deficiency in patients with psoriasis and psoriatic arthritis”. *Asian Journal of Pharmaceutical and Clinical Research* 2020; 13(11): 168-70.
  19. **Ibrahim AM, Altamimy HM, Rayan MM, Abdul-Hamied HI.** Measurement of vitamin (d) and its relation to psoriatic arthritis patients. *Al Azhar Assuit Medical Journal* 2013; 11 (2):292-304.
  20. **Petho Z, Kulcsar-Jakab E, Kalina E, Balogh A, Pusztai A, Gulyas K, Horvath A, Szekanecz Z, Bhattoa HP.** Vitamin D status in men with psoriatic arthritis: a case-control study. *Osteoporos Int.* 2015; 26(7):1965-70.



- doi: 10.1007/s00198-015-3069-2. Epub 2015. PMID: 25693749.
21. **Touma Z, Eder L, Zisman D, Feld J, Chandran V, Rosen CF, Shen H, Cook RJ, Gladman DD.** Seasonal variation in vitamin D levels in psoriatic arthritis patients from different latitudes and its association with clinical outcomes. *Arthritis Care Res (Hoboken)*. 2011; 63(10):1440-7. doi: 10.1002/acr.20530. PMID: 22121512.
  22. **El Tawab S, Eldeeb ME, Abdel-Fattahah YH.** Vitamin D in skin psoriasis and psoriatic arthritis: where does it stand? *J Egypt Womens Dermatol Soc* 2021; 18:97-10
  23. **Gamonal SBL, Gamonal ACC, Marques NCV, Brandão MAF, Raposo NRB.** Is vitamin D status relevant to psoriasis and psoriatic arthritis? A retrospective cross-sectional study. *Sao Paulo Med J*. 2022; 141(3): e2022216. doi: 10.1590/1516-3180.2022. 0216. R1.01072022. PMID: 36214524; PMCID: PMC10065110.
  24. **Filoni A, Vestita M, Congedo M, Giudice G, Tafuri S, Bonamonte D.** Association between psoriasis and vitamin D: Duration of disease correlates with decreased vitamin D serum levels: An observational case-control study. *Medicine (Baltimore)*. 2018; 97(25): e11185. doi: 10.1097/MD.00000000000011185. PMID: 29924036; PMCID: PMC6023690.
  25. **Sağ MS, Sağ S, Tekeoğlu İ, Solak B, Kamanlı A, Nas K, Harman H, Kantar M.** Comparison of 25-hidroksi Vitamin D serum concentrations in patients with psoriasis and psoriatic arthritis. *J Back Musculoskelet Rehabil*. 2018; 31(1):37-43. doi: 10.3233/BMR-169617. PMID: 28946518.
  26. **Rotondo C, Cantatore FP, Cici D, Erroi F, Sciacca S, Rella V, Corrado A.** Vitamin D Status and Psoriatic Arthritis: Association with the Risk for Sacroiliitis and Influence on the Retention Rate of Methotrexate Monotherapy and First Biological Drug Survival—A Retrospective Study. *International Journal of Molecular Sciences*. 2023; 24(6):5368. <https://doi.org/10.3390/ijms24065368>
  27. **Fernandes S, Etcheto A, van der Heijde D, Landewé R, van den Bosch F, Dougados M, Moltó A.** Vitamin D status in spondyloarthritis: results of the ASAS-COMOSPA international study. *Clin Exp Rheumatol*. 2018; 36(2):210-214. Epub 2017. PMID: 29148411.
  28. **Kincse G, Bhattoa PH, Herédi E, Varga J, Szegedi A, Kéri J, Gaál J.** Vitamin D3 levels and bone mineral density in patients with psoriasis and/or psoriatic arthritis. *J Dermatol*. 2015; 42(7):679-84. doi: 10.1111/1346-8138.12876. Epub 2015 May 11. PMID: 25959376.
  29. **Montolio-Chiva L, Robustillo-Villarino M, Orenes Vera AV, et al.** AB0807 vitamin d role in vascular damage progression in patients with psoriatic arthritis. *Annals of the Rheumatic Diseases* 2020; 79:1705.
  30. **Plotnikoff GA and Quigley JM.** Prevalence of severe hypovitaminosis D in patients with persistent, nonspecific musculoskeletal pain. *Mayo Clin Proc* 2003; 78 (12):1463-1470.
  31. **Deng S, He Y, Nian X, Sun E, Li L.** Relationship between Vitamin D levels and pain and disease activity in patients with newly diagnosed axial spondyloarthritis. *Int J Nurs Sci*. 2019; 7(1):54-59. doi: 10.1016/j.ijnss.2019.12.005. PMID: 32099860; PMCID: PMC7031124.
  32. **Zhao S, Duffield SJ, Moots RJ, Goodson NJ.** Systematic review of association between vitamin D levels and susceptibility and disease activity of

- ankylosing spondylitis. Rheumatology (Oxford). 2014; 53(9):1595-603. doi: 10.1093/rheumatology/keu042. Epub 2014. PMID: 24706990.
33. **Cai G, Wang L, Fan D, Xin L, Liu L, Hu Y, Ding N, Xu S, Xia G, Jin X, Xu J, Zou Y, Pan F.** Vitamin D in ankylosing spondylitis: review and meta-analysis. Clin Chim Acta. 2015; 438:316-22. doi: 10.1016/j.cca. 2014. 08.040. Epub 2014. PMID: 25199851.
34. **Braun-Moscovici Y, Toledano K, Markovits D, Rozin A, Nahir AM, Balbir-Gurman A.** Vitamin D level: is it related to disease activity in inflammatory joint disease? Rheumatol Int. 2011; 31(4):493-9. doi: 10.1007/s00296-009-1251-6. Epub 2009 Dec 23. PMID: 20033415.
35. **Pavlov SI, Ivanova II, Gerova D.** Vitamin D status in patients with psoriasis. Scripta Scientifica Medica, 2016; 48:50–54.

### حالة فيتامين د لدى مرضى التهاب المفاصل الصدفي المصريين وعلاقته بنشاط المرض وشدته

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**الخلفية:** وصفت الكثير من الأدلة العلمية ارتفاع معدل نقص فيتامين (د) في مرضى الصدفية والتهاب المفاصل الصدفي. تم الإبلاغ عن بيانات متناقضة حول الارتباط المحتمل بين المستويات المنخفضة من فيتامين (د) وحالة الالتهاب أو نشاط المرض.

**الهدف من البحث:** الهدف من هذه الدراسة هو تقييم حالة فيتامين (د) في المرضى المصريين المصابين بالتهاب المفاصل الصدفي والتعرف على تأثير نقص فيتامين (د) على شدة المرض ونشاطه.

**الطريقة:** الدراسة شملت ٤٥ مريض التهاب المفاصل الصدفي تم تشخيصهم طبقاً لتوجيهات المنظمة الأمريكية للأمراض الروماتيزمية و تم جمعهم من عيادة الروماتيزم وقسم الباطنة العامة. و ٥٠ شخص اصحاء. تم فحص المرضى بعد اخذ التاريخ المرضي ثم عمل فحوصات شملت سرعه الترسيب و بروتين سى النشط تم قياس معدل فيتامين (د) في الدم لكلا من المرضى و الاصحاء.

**النتائج:** وجدنا ان معدل حالات نقص فيتامين (د) في المرضى اكثر من الاصحاء. بعد تقسيم المرضى الى مجموعتين, وجدنا ان المجموعه التي تعاني من نقص فيتامين (د) لديها مده مرض اطول و احساس بالالم اعلى و نسبه الاعاقه الحركيه اعلى و اصابه العمود الفقري اعلى و كذلك لديهم سرعه ترسيب و بروتين سى نشط اعلى من المجموعه التي لا تعاني من نقص فيتامين (د).

**الاستنتاجات:** نقص فيتامين (د) منتشر بين مرضى التهاب المفاصل الصدفي اكثر من الاصحاء. نقص فيتامين (د) مرتبط بزياده مده المرض و ارتفاع معدل نشاط المرض و شدته.