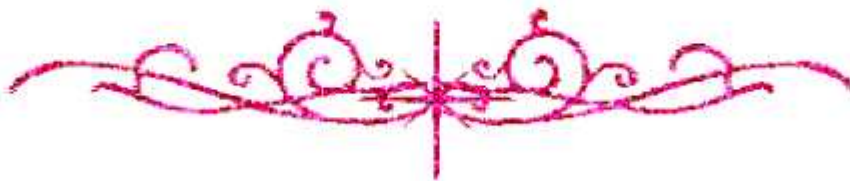


# بسم الله الرحمن الرحيم





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



# جامعة عين شمس

التوثيق الإلكتروني والميكرو فيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأقراص المدمجة قد أعدت دون أية تغييرات



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تحتفظ هذه الأقراص المدمجة بعيدا عن الغبار





# **Relation between hand bone mineral density, degree of joint destruction and hand function in adults rheumatoid arthritis patients**

Thesis

Submitted for Partial Fulfillment of the requirements of  
Master Degree  
**In Physical Medicine, Rheumatology and Rehabilitation**

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*Aya Nasreldin*

## **ABSTRACT**

**BACKGROUND:** Rheumatoid Arthritis [RA] is a chronic systemic disease that affects the functional capacity of the hand due to inflammatory arthritis and joint destruction. RA patients have difficulties with everyday life activities and daily living activities. The prevalence of osteoporosis is estimated to be about twice that of the general population. Dual-energy X-ray absorptiometry (DEXA) is the most precise tool for detecting loss in bone mineral density in RA. Aim of the study: This study aims to investigate the relation between generalized bone mineral density (BMD) and each of hand joint destruction and hand function in order to find out its possible role in assessment of rheumatoid hand disability.

**PATIENTS AND METHODS:** Fifty patients diagnosed as RA based on the 2010 ACR Rheumatoid Arthritis Classification Criteria were included in this study. All patients were subjected to the following scores: Duruöz Hand Index (DHI), Grip Ability Test (GAT), Grip strength test, and Pinch strength tests for assessing the function of the dominant hand of each patient. The participants were also subjected to plain x-ray evaluated by van der Heijde-modified total Sharp score (vdH-S) to assess the damage of the joints of the dominant hand, and Dual-energy X-ray absorptiometry (DEXA) to assess the Bone Mineral Density.

**RESULTS:** The current study showed that wrist BMD was correlated with grip strength, pinch strength, GAT, and van der Heijde modified sharp score of the dominant hand. Moreover, X-ray joint findings were significantly correlated with each of total grip ability test, grip strength, and pinch strength as the hand disability manifested more with joint damage.

**CONCLUSION:** In conclusion, Osteoporosis, hand function, and joint damage in RA are correlated suggesting related pathophysiological mechanisms. The Severity of RA could be related to osteoporosis as well as joint destruction and hand disability.

**KEYWORDS:** DEXA, hand function, Rheumatoid Arthritis [RA], van der Heijde-modified total Sharp score (vdH-S).

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## List of Abbreviations

<b>Abb.</b>	<b>Full Term</b>
<b>ACPA</b> .....	Anti-Citrullinated Protein Antibodies
<b>ADLs</b> .....	Activities of Daily Living
<b>AHFT</b> .....	Arthritis Hand Function Test
<b>anti-CCP</b> .....	Antibodies to Cyclic Citrullinated Peptides
<b>BBT</b> .....	the Box and Block Test
<b>BMD</b> .....	Bone mineral density
<b>CAD</b> .....	Coronary Artery Disease
<b>CBC</b> .....	Complete Blood Count
<b>CCP</b> .....	Cyclic Citrullinated Peptide
<b>CD40</b> .....	Cluster of Differentiation 40
<b>CDAI</b> .....	Clinical Disease Activity Index
<b>CHF</b> .....	Congestive Heart Failure
<b>CRP</b> .....	C-reactive Protein
<b>CT</b> .....	Computed Tomography
<b>CTLA4</b> .....	Cytotoxic T-lymphocyte Antigen 4
<b>DAS</b> .....	Disease Activity Score
<b>DXA</b> .....	Dual-Energy X-ray Absorptiometry
<b>DHI</b> .....	Duruöz Hand Index
<b>DIPs</b> .....	Distal Interphalangeal Joints
<b>DMARDs</b> .....	Disease-Modifying AntiRheumatic Drugs
<b>ESR</b> .....	Erythrocyte Sedimentation Rate
<b>FLS</b> .....	Fibroblast-Like Synoviocytes
<b>GAT</b> .....	Grip Ability Test
<b>GI</b> .....	Gastrointestinal
<b>GSTM1</b> .....	Glutathione S-Transferase Mu 1

## **List of Abbreviations (Continued)**

<b>Abb.</b>	<b>Full Term</b>
<b>GWAS</b> .....	Genome-Wide Association Studies
<b>HLA</b> .....	Human Leukocyte Antigen
<b>HS</b> .....	Highly Significant
<b>IFN</b> .....	Interferons
<b>Ig</b> .....	Immunoglobulin
<b>IL</b> .....	Interleukins
<b>ILD</b> .....	Interstitial Lung Disease
<b>IQR</b> .....	Interquartile Range
<b>ISCD</b> .....	International Society for Clinical Densitometry
<b>MCPs</b> .....	Metacarpophalangeal Joints
<b>M-CSF</b> .....	Macrophage-Colony Stimulating Factor
<b>MHC</b> .....	Major Histocompatibility Complex
<b>MIR 146A</b> .....	microRNA 146A
<b>MRI</b> .....	Magnetic Resonance Imaging
<b>MRM</b> .....	Minnesota Rate of Manipulation test
<b>NOF</b> .....	National Osteoporosis Foundation
<b>NS</b> .....	Non Significant
<b>OA</b> .....	Osteoarthritis
<b>OPG</b> .....	Osteoprotegerin
<b>PAS- II</b> .....	Patient Activity Scale-II
<b>PIPs</b> .....	Proximal interphalangeal joints
<b>pQCT</b> .....	Peripheral Quantitative Computed Tomography
<b>PRKCQ</b> .....	Protein Kinase C Theta Type
<b>PSI</b> .....	Pounds Per Square Inch

## List of Abbreviations (Continued)

<b>Abb.</b>	<b>Full Term</b>
<b>PSORS1C1</b> .....	Psoriasis Susceptibility 1 Candidate 1
<b>PTPN22</b> .....	Protein Tyrosine Phosphatase Non-Receptor Type 22
<b>r</b> .....	The Correlation Coefficient
<b>RA</b> .....	Rheumatoid Arthritis
<b>RANKL</b> .....	Receptor Activator of Nuclear Factor $\kappa$ B Ligand
<b>RAPID-3</b> .....	Routine Assessment of Patient Index Data 3 Measures
<b>RF</b> .....	Rheumatoid Factor
<b>S</b> .....	Significant
<b>SD</b> .....	Standard Deviation
<b>SDAI</b> .....	Simplified Disease Activity Index
<b>SNP</b> .....	Single Nucleotide Polymorphism
<b>STAT4</b> .....	Signal Transducer and Activator of Transcription 4
<b>TH</b> .....	T Helper Cells
<b>TNFAIP3</b> .....	Tumor Necrosis Factor Alpha-Induced Protein 3
<b>TNF<math>\alpha</math></b> .....	Tumor Necrosis Factor Alpha
<b>TRAF1</b> .....	Tumor Necrosis Factor Receptor Associated Factor 1
<b>UEFT</b> .....	the Upper Extremity Function Test
<b>ULN</b> .....	the Upper Limit of Normal Value
<b>US</b> .....	Ultrasound
<b>vdH-S</b> .....	van der Heijde-Modified Total Sharp Score
<b>WHO</b> .....	World Health Organization

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