EFFICACY OF PULSED MAGNETIC FIELD ON BONE DENSITY IN JUVENILE RHEUMATOID ARTHRITIS

A Thesis

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By

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فاعلية المجال المغناطيسى المتقطع على كثافة العظام فى الروماتويد المفصلى عند الأطفال/ محمد أحمد محمود عيد– **المشرفون** / أ.د. فاتن حسن عبد العظيم ، أ.د. هالة صلاح الدين محمد طلعت ، د. منال صلاح الدين عبد الوهاب ، د. رقية عبد الشافى سليمان البنا– جامعة القاهرة، كلية العلاج الطبيعى **القسم:** العلاج الطبيعى لاضطرابات مراحل النمو والتطور وجراحتها عند الأطفال، ٢٠٠٩ . ١٤٧ صفحة فى ترتيبات متعددة.

المستخلص

يهدف هذا البحث إلى دراسة فاعلية المجال المغناطيسى المتقطع منخفض التردد والشدة على كثافة العظام فى الروماتويد المفصلى عند الأطفال وقد أجرى هذا البحث على ٣٠ مريض تم تقسيمهم عشوائيا إلى مجموعتين متساويتين وهما المجموعة الحاكمة وتضم ١٥ مريض والمجموعة التجريبية وتضم ١٥ مريض أيضاً وشمل البرنامج العلاجى لمرضى المجموعة الحاكمة مجموعة من التمارين العلاجية المختارة وهى(تمرينات الإطالة – تمرينات التقوية). اما المجموعة التجريبية فقد شمل البرنامج العلاجى نفس مجموعة التمارين المختارة التى خضعت لها المجموعة الحاكمة بالاضافة الى المجال المغناطيسى المتقطع منخفض التردد والشدة على منطقتى اسفل الظهر والحوض. وقد أجريت القياسات لهاتين المجموعتان قبل وبعد الفترة العلاجية والتى امتدت إلى ستة أشهر وقد أثبت التحليل الإحصائي وجود تحسن ذو دلالة إحصائية واضحة لمرضى المجموعتين ولكن ذو دلالة إحصائية عالية في نتائج المجموعة التجريبية عند مقارنة نتائج ما قبل وبعد العلاج لكل مجموعة.

الكلمات الدالة : المجال المغناطيسى – الروماتويد المفصلى عند الأطفال– كثافة العظام.

Efficacy of Pulsed Magnetic Field on Bone Density in Juvenile Rheumatoid Arthritis/ Mohamed Ahmed Mahmoud Eid*; **Supervisors**: Prof. Dr. Faten Hassan Abd Elaziem*. - Prof. Dr. Hala Salah El- Din Mohamed Talaat**.- Dr. Manal Salah El-Din Abdel-Wahab*.- Dr. Rokia Abd El-Shafy Soliman El-Banna***, Faculty of Physical Therapy, Cairo University, Doctoral Thesis.
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Abstract

The purpose of this study was to examine the effect of low frequency and low intensity pulsed magnetic field (LFLIPMF) therapy on bone mineral density in children with polyarticular JRA. Thirty children with polyarticular JRA were assigned randomly into two groups of equal number. Each patient of the two groups was evaluated before and after six months of treatment by using dual energy x-ray absorptiometry (DEXA). The evaluation procedure involved measurement of bone mineral density of the femur, lumbar spine, arms and total body. Control group (n = 15) that were treated by the selected physical therapy program (stretching exercises and strengthening exercises in the form of bicycle ergometer and treadmill training) for one hour. Study group (n = 15) that were treated by the same exercise program given to the control group in addition to low frequency and low intensity pulsed magnetic field therapy with a frequency of 33 Hz, intensity of 20G for 30 minutes duration, three sessions were conducted per week (each session lasted one and half hour) for successive six months (24 weeks). **Results:** The collected data was processed and statistically analyzed using paired and unpaired t-test. The results showed a statistically significant improvement in all parameters in both control and study groups but still significant difference were recorded in favor of study group. **Conclusion**: it is possible to conclude that (LFLIPMF) is an effective modality in increasing bone mineral density in juvenile rheumatoid arthritis (JRA).

Key words: Magnetic Field, Juvenile Rheumatoid Arthritis, Osteoporosis.

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Contents

List of Abbreviations

A	**:**	Ampere
ACR	**:**	American College of Rheumatology
ANA	**:**	Anti Nuclear Antibodies
BAP	**:**	Bone-specific Alkaline Phosphatase
BMC	**:**	Bone Mineral Content
BMD	**:**	Bone Mineral Density
CBC	**:**	Complete Blood Count
CRP	**:**	C- Reactive Protein
CT	**:**	Computed Tomography
DEXA	**:**	Dual Energy X-ray Absorptiometry
DPA	**:**	Dual Photon Absorptiometry
DPD	**:**	Deoxypyridinoline
EF	**:**	Electric Field
ELF		Extremely Low Frequency
ELFMF	**:**	Extremely Low Frequency Magnetic Field
EMF	**:**	Electromagnetic Field
ESR	**:**	Erythrocyte Sedimentation Rate
F	**:**	Frequency
G	**:**	Gauss

Hgb	**:**	Hemoglobin
Hz	**:**	Hertz
JCA	**:**	Juvenile Chronic Arthritis
JRA	**:**	Juvenile Rheumatoid Arthritis
KV	**:**	Kilo Volt
LFLIPMF	**:**	Low Frequency and Low Intensity Pulsed Magnetic Field.
Lymph	**:**	Lymphocytes
mA	**:**	Milli Ampere
MF	**:**	Magnetic Field
mG	**:**	Milli gauss
MD	**:**	Mean Difference
MRI	**:**	Magnetic Resonance Imaging
NS	**:**	Non Significant
NSAID	**:**	Non-Steroidal Anti-Inflammatory Drugs
PEMF	**:**	Pulsed Electromagnetic Field
PMF	**:**	Pulsed Magnetic Field
PGE2	**:**	Prostaglandin
PROM	**:**	Passive Range of Motion
P value	**:**	Probability value
RA	**:**	Rheumatoid Arthritis

RF	**:**	Rheumatoid Factor
ROM	**:**	Range Of Motion
SEF	**:**	Static Electric Field
SD	**:**	Standard Deviation
SMF	**:**	Static Magnetic Field
SPA	**:**	Single Photon Absorptiometry
T	**:**	Tesla
TENS	**:**	Transcutaneous Electrical Nerve Stimulation
VAS	**:**	Visual Analogue Scale
WHO	**:**	World health organization

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