Determined the Biological Changes in the Head of the Rats Consumed Magnetically affected Water by Body Scan Devise

Manar Abd Alrazaq Hassan

Assistant Lecturer, University of Diyala, College of Medicine, Department of Anatomy

Abstract

Background: the electromagnetic field that affected on the drinking water cause significant changes in the quality of drinking water, these changes occur within the minerals and organic component of its composition. Therefore, facilitated penetration into cell wall in all body and make the water racy for growth and development of different organs. DXA is a distinct imaging modality it was offered with general uses X ray systems, because of the necessity for distinct beam filtering and near perfect spatial discography of the two attenuations. Used this devise able to measure the weight and area of all head compartment of rats that take magnetized water every day.

Objectives: evaluation the beneficial effects of magnetized water on the soft head component of the rats. whether assessed the changes in soft tissue mass measured using DXA in the head regions of rats.

Methods: thirty adult male rats were examined in this study. The rats age about 6weeks. Then divided all rats randomly to two group:

1. Control group: 15 rats
2. Experimental group: 15 rats

Each rat in experimental and control group examined former to drinking water and then the experimental group consumed on the magnetized water and control group consumed on the ordinary water regularly for 30 days and then examined the head of each rate by DXA scan and show the differences among the value (weight and area to each lean and fat of rats head). Data were analyzed statistically by P vale ($P \leq 0.05$).

Results: High significant differences in the area and weight of the head (lean and fat) of rats that consumed magnetically affected water when compared the result values statistically

Conclusion: The current study represented increase the weight by grams and area by cm^2 for the head compartment when consumptions daily magnetized water.

Keywords: *Bone, Fat, Lean, Magnetized Water, DXA.*

Introduction

Body composition mentions to the total lean and fat tissues in the body[1]. Bone of the head that act as hard compartment give protection and support to the soft compartment, it was basically highly living, mineralized, vascular connective tissue. It was remarkable for its pliancy, hardness and capability to furbishing[2,3] Although body mass and body weight index were well known evidence of health fettle[1].

Yardsticks the body composition are important and basal for an exhaustive assessment for nutrition status[1,4]. Estimating the change in body weight "predominantly weight loss" during the path of a clinical condition has

Corresponding Author:
Manar Abd Alrazaq Hassan
Assistant Lecturer, University of Diyala,
College of Medicine, Iraq, Diyala – Baqubah.
E-mailID: manar.hito99@gmail.com
Contact No: 07700140388

been a dominant finish point for the assessment the status of nutrition. In fact, useful when fundamental changes are noticed[4]. The terms Lean Body Mass (LBM) and Fat Free Mass (FFM) are often used in determined body weight compartment interchangeably, although they delineation different structures of the body compartments. "Lean Soft Tissue (LST)" value used to anticipate nutrition fettle and estimated the clinical risk situations. While it is significant for the bibliophile to understand exact body compartment (i.e., muscle, LST, or FFM) is being gauged in a detailed deliberating, decrease or increase of these compartments follow in parallel to each other[1].

1.1. Magnetized Water:

The interest in the bio-effects of electromagnetic field interactions with living organisms has been growing in recent decades. All living things are still subjected to industrial and electromagnetic fields. The interaction mechanisms of biological systems and electromagnetic fields are only partly understood by domestic sources induced by "ELF-MF" on cell activity[5,6].

The Magnetized System important for create magnetic field makes the water magnetize[5]. The beneficial results that are studied in magnetized water for humans and animals are improvement in water excellence, which is observed after subjected to the magnetic field with major changes in pH of dissolved solids, total hardness, salinity, conductivity, dissolved oxygen, vaporized temperature, minerals, organic matter and total bacteria count[7].

It will then promote cell wall penetration, which can speed up ordinary penetration. The magnetized water diffusion is important for the production of various organs. "Magnetic water implies water elapse from magnetic tubes and insertion the magnet in water, so that water's properties developed to very active and yielded, resulting high ratio of oxygen, velocity of dissolved salts and amino acids in water"[5,7]. Fresh water is called "dead water" later sterilization and magnetization water conveys from dead to live[8,7,5]. In order to become more energized, dynamic, and high pH towards mild alkaline and germ-free, so the treated water properties could be modified[9].

1.2. Dual-Energy X-ray Absorptiometry:

DXA (Dual-Energy X-ray Absorptiometry) is the simplest way to calculate body weight and area composition, making it the best fracture risk predictor available[10,11] Figure (1).

DXA is a commonly used technique that at the molecular level tests body composition. Full-body and district levels the mass, area and density of bone, fat and fat-free soft tissues, as well as and at which can be evaluated Figure (2)[12,13]. The facility to measure appendicular skeletal muscle (ASM) mass by arithmetic the extent of LST in structures and the brain, which is predominantly muscle, is a significant benefit of the use of DXA (except for a slight amount of connective tissue and skin)[14]. ASM has been broadly used in the study of sarcopenia and the institution of final points for the definition of this pattern[15,16].

Little-radiation x-rays with 2 unlike photon energy levels travel through the body during a DXA scan and are detected by a photon detector that calculates the amount of energy taken (attenuation) at each pixel by soft and hard tissue[5]. Soft tissue is further sectioned into fat and lean on the origin of both pure fat and bone-free soft tissue empirical attenuation[17]. DXA is also an actual accurate tool for body structure quantification; its whole accuracy tops that of any other technique for body structure[18]. The body's thickness will influence the outcome of DXA[19]. Increased tissue thickness more than 25 cm contributes to increased photons of energy attenuation, initiating a disproportionate change to great-energy photons, which can contribute to fat mass irony in stocky patients[20].

DXA Uses x-rays of very low radiation from 2 energy beams. To distinguish between soft tissue and bone, the production of a great and short energy emission by used x-ray source. Significant benefit of DXA Distinguishes fat, lean, and bone tissue, local measurements of body structure can be gained. Secure for frequent interventions; fast and non-invasive. Strong accuracy and exactness. Therefore, there are variations inside and between producers and versions of software. Failure to separate compartments in fat and lean tissues. Quantities are affected by tissue wideness and hydration

of lean tissue[21, 22].

Finally, DXA's inability to read the various forms of fat if it visceral or subcutaneous, and intramuscular fat and LST includes muscle and organs can also be a functional weakness in clinical settings for this modality[23]. In totaling, orthopedic implants may produce pieces that affect DXA capacities, leading to the inexact distinguish the parameters of soft tissue[24]. While minute is recognized about the overall impact of same objects on measurements of whole-body conformation[25, 26, 27].

Figure 1. Dual-energy X-ray Absorptiometry DXA

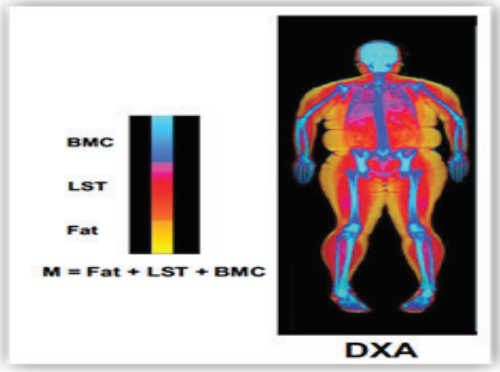

Figure 2. Selected body composition components measured by dual-energy X-ray absorptiometry.

1.3. Soft Tissue Mass (STM):

It is well known that about 40 % of the fat-free mass of skeletal muscle mass (SMM) is (FFM)[28, 29]. And the mass of fat tissue (FTM). In addition, FFM has been consistently documented to be closely correlated with SMM in these former trainings, FFM has been used as a guide of the improvement in SMM succeeding workout training. However, it is regularly unclear if the alteration in FFM subsequent training is related to the alteration in SMM[30, 31, 32].

In a single evaluation, DXA allows concurrent estimate of total and district lean soft tissue mass (LSTM) and fat mass. It is therefore theoretically possible that the LSTM calculated using DXA represents the SMM measured using MRI after exercise training, and the first phase in this research was to investigate this chance. Alternatively, because the body contains internal organs, it is not just the SMM that represents the LSTM of the trunk area. In addition, it is difficult to measure accurately[33, 34].

Material Methods

Thirty adult male rats were examined in this study. The rats age about 6 weeks. Then divided all rats randomly to two group:

1. Control group: 15 rats
2. Experimental group: 15 rats

Each rat in experimental and control group examined former to beginning the experiment and then control group consumed on the ordinary tap water regularly for 30 days, and the experimental group consumed on the magnetized water for 30 days, and then examined the head of each rate by DXA scan and show the differences among the value of head compartments (weight and area of each lean and fat of rat's head).

2.1. Magnetic Exposure:

The water is put in the open side of magnetized device and making sure the tap water container connected closely to the other side and open the electric continuous power point and adjust the voltage regulator and timer to calculate the magnetization cycle Timing. The exposure time was 60 seconds and the water was collected by the magnetically exposed water to be ingested by the rats[5].

2.2. Statistical Analysis:

The mean of each quantities for each rat was linked

with the mean of the control values. And set the level of significance at $P \leq 0.05$. Corresponding values were measured for all scanned heads of rats for minimized interaction with the statistical results. ANOVA test were used for each numbered gage of head compartment to evaluate the average differences between the control and experimental rats of the study[35].

Results

Amounts of biological characteristics was changes in soft composition of the head subsequent to magnetized water consumption for a mean length of 30 days reveled the soft tissue component in the head of present rats has increased significantly in weight and area of lean tissue the results were managed and analyzed using SPSS 20.0. For total values of the variables, the means and standard deviation were centered quantitative variables (area and weight of lean and fat tissue of rat head) as in tables number 1, 2, 3 and 4). The spreading of (head fat and lean tissue of head) was analyzed for normality using the post-hoc Tukey's test. The ANOVA test was used where fitting the examiner difference in means among the variables. P-values was determining the difference between lean and fat area and weight in both control and experimental group before and after the daily consumption of normal and magnetized water respectively.

Table 1. Descriptive Statistics for Lean area and Lean weight

Source			Lean area		Lean weight	
Groups	**Assaying**	**No.**	**Mean**	**Std. Deviation**	**Mean**	**Std. Deviation**
Control Group	Before Treatment	6	237.66667	23.209194	638.33333	34.511834
	After Treatment	6	261.50000	22.331592	677.16667	34.394282
Experimental Group	Before Treatment	6	236.83333	9.579492	735.16667	39.463485
	After Treatment	6	385.33333	11.147496	1027.00000	52.295315

The table 1. Reveled increased the mean value of the lean area and weight in experimental group after consumption the magnetized water for 30 days when we compared with the same rat before the consumption the magnetized water. On the other hand, the table showed highly increased the mean value of the lean area and weight in experimental group after consumption the magnetized water when we compared with the control group rate after the consumption the normal water at same condition (Age, sex and 30 days of different water types consumption).

Table 2. Descriptive Statistics for Fat area and Fat weight

Source			Fat area		Fat weight	
Groups	**Assaying**	**No.**	**Mean**	**Std. Deviation**	**Mean**	**Std. Deviation**
Control Group	Before Treatment	6	243.0000	7.40270	188.8333	6.30608
	After Treatment	6	251.5000	10.82128	199.6667	4.92612
Experimental Group	Before Treatment	6	244.8333	7.93515	187.8333	6.17792
	After Treatment	6	388.3333	8.98146	249.0000	17.81011

The table 2. Reveled increased the mean value of the fat area and weight in experimental group after consumption the magnetized water for 30 days when we compared with the same rat before the consumption the magnetized water. On the other hand, the table showed highly increased the mean value of the fat area and weight in experimental group after consumption the magnetized water when we compared with the control group rat after the consumption the normal water at same condition (Age, sex and 30 days of different water types consumption).

Inferential statistic by ANOVA test for lean area and lean weight table 3. And fat area and weight table 4. reveled highly significant difference among the variables when compared between control and experimental group, and showed highly significant difference among the variables when compared the values of area and weight for lean and fat after and before treated the rat with normal water in control group and magnetized water in experimental group for 30 days.

Table 3. Group and Assaying difference by ANOVA test for Lean area and Lean weight

Source		Lean area		Lean weight	
		Std. Error	Sig.	Std. Error	Sig.
Group difference	Control Group	10.834	.001	22.656	.000
	Experimental Group	10.834		22.656	
Assaying difference	Before Treatment	10.834	.000	22.656	.000
	After Treatment	10.834		22.656	

Table 4. Group and Assaying difference by ANOVA test for Fat area and Fat weight

Source		Fat area		Fat weight	
		Std. Error	Sig.	Std. Error	Sig.
Group difference	Control Group	10.712	.000	4.838	.000
	Experimental Group	10.712		4.838	
Assaying difference	Before Treatment	10.712	.000	4.838	.000
	After Treatment	10.712		4.838	

Discussion

The exposure of water to powerful magnetic fields has changed its effects Today, the use of magnets to enhance quality of normal water was important because of the little cost of the water treatment compared to treatments by chemical and physical methods[9].

On the other hand, there were high-significant improvements in water consumption, although the metabolic factor improved by magnetization and increased fat and lean weight only among animals of magnetized water group that were consumed water magnetically treated, the highest improvement was proof of water consumption in water groups that were magnetically treated. Magnetically treated water that makes animals thirstier may be planned use to improve body and immune system hygiene and increase the health level of the body[36].

At present, the improvements in LST and FST after daily drinking of magnetized water are easily estimated. This crow sectional analysis showed that the results calculated using DXA scan for the head field, although this result was higher in area and weight than in the control group after 30 days from the beginning of the experiment, this agreed with the results[37].

When we assessed after 30 days of drinking magnetized water, LST and FST of the head showed a highly significant improvement in area and weight about 35 % -40 % than the control group, this magnetic field for 30 days offered an effective way to increase fat and lean density in Wistar rats[38, 39].

Conclusion

The adduce study shown that DXA allows for an accurate, reliable and secure estimate of head SMM changes following the intake of magnetized water. The use of DXA is particularly useful for medical, scientific and research environments, such as in the fields of medicine and physiology, as the measurement of SMM by using DXA has the benefit of including a limited period of scan and image examination. The current study showed an empirical increase in weight and area for the head portion of soft tissue, which includes fat and lean tissue mass, when magnetized water is ingested daily.

Conflict of Interest: None

Source of Support: Self

Ethical Clearance: Ethical clearance and funding were not necessary as it was a retrospective study which included only collection of data.

Reference

1. Carla M. M. Prado and Steven B. Hempfield. Lean Tissue Imaging: A New Era for Nutritional Assessment and Intervention, Journal of Parenteral and Enteral Nutrition Volume 38 Number 8November 2014 940–953
2. Abd Alrazaq H. Manar, Histological and Immunohistochemical Evaluation for Bone Morphogenic Protein-2 on Healing Process of Extracted Tooth Socket Treated by Grape Seed Oil in Rabbits. Thesis, College of Dentistry, Baghdad University, department of the Oral Histology, 2019. pp:1,
3. DASMAH A. On Remodeling and Function of Autogenous Bone Grafts in Maxillary, Head and Face Medicine, 2013; p:30-49
4. Prado CM, Siervo M, Mire E, et al. A population-based approach to define body-composition phenotypes. Am J Clin Nutr. 2014;99(6):1369-1377.
5. Abd Alrazaq H. Nour, Hussain M. Tahseen and Fadhel G.Nameer. Evaluation the Effect of Magnetized Water on The Bone Density and Osteoporosis In The Experimental Rats By DXAScan. Diyala Journal of Medicine, April 2019, Vol.16.Issue 1, pp:70-80.
6. Ikezoe, N.; Hirota, J.; Nakagawa, S. and Kitazawa, K. (1998). Making water levitate.Natural, 393: 749-750.
7. Al-Nuemi SH, Al-Badry KI, Atteyh AJ, Al-SabeeaWS, Ibrahim FF, and Rajab BA (2015). Effect of magnetic water drinking on testis dimension, scrotal circumference and blood parameters of holstein bulls born in Iraq. AdvAnim Vet Sci 3(7): 413-417.
8. Batmanghelidj F. Diamagnetic water. Is it just water Biomagnetizerbiophysics institute? Canada2005.
9. Yacout M. H., Hassan A. A., Khalel M.S., Shwerab A. M. and Abdel-Gawad. E. I.,

2015. Effect of Magnetic Water on the Performance of Lactating Goats. J. Dairy Vet. Anim. Res., 2(5): 00048

10. Yates AJ, Ross PD, Lydick E, Epstein RS. Radiographic absorptiometry in the diagnosis of osteoporosis [review]. Am J Med 1995;98(2A): S41-7.
11. Genant HK, Engelke K, Fuerst T.Noninvasive

assessment of bonemineral and structure: state of the art. IBoneMinerRes,1996:11;707-30.

12. Heymsfield SB, Wang Z, Baumgartner RN, Ross R. Human body composition: advances in models and methods. Annu Rev Nutr. 1997;17: 527-558.
13. Heymsfield SB, Adamek M, Gonzalez MC, Jia G, Thomas DM. Assessing skeletal muscle mass: historical overview and state of the art. J Cachexia Sarcopenia Muscle. 2014;5(1):9-18.
14. Heymsfield SB, Smith R, Aulet M, et al. Appendicular skeletal muscle mass: measurement by dual-photon absorptiometry. Am J Clin Nutr. 1990;52(2):214-218.
15. Prado CM, Wells JC, Smith SR, Stephan BC, Siervo M. Sarcopenic obesity: a critical appraisal of the current evidence. Clin Nutr. 2012;31(5):583-601.
16. Cruz-Jentoft AJ, Baeyens JP, Bauer JM, et al. Sarcopenia: European consensus on definition and diagnosis: report of the European Working Group on Sarcopenia in Older People. Age Ageing. 2010;39(4):412-423.
17. Roubenoff R, Kehayias JJ, Dawson-Hughes B, Heymsfield SB. Use of dual-energy x-ray absorptiometry in body-composition studies: not yet a "gold standard." Am J Clin Nutr. 1993;58(5):589-591.
18. Pritchard JE, Nowson CA, Strauss BJ, Carlson JS, Kaymakci B, Wark JD. Evaluation of dual energy x-ray absorptiometry as a method of measurement of body fat. Eur J Clin Nutr. 1993;47(3):216-228.
19. Lohman TG, Chen Z. Dual-energy x-ray absorptiometry. In: Heymsfield SB, Lohman T, Wang Z, Going S, eds. Human Body Composition. 2nd ed. Champaign, IL: Human Kinetics; 2005;63-78.
20. Genton L, Hans D, Kyle UG, Pichard C. Dual-energy x-ray absorptiometry and body composition: differences between devices and comparison with reference methods. Nutrition. 2002;18(1):66-70.
21. Madsen OR, Egsmose C, Lorentzen JS, Lauridsen UB, Sorensen OH. Influence of orthopaedic metal and high-density detection on body composition as assessed by dual-energy x-ray absorptiometry. Clin Physiol. 1999;19(3):238-245.
22. Hangartner TN, Warner S, Braillon P, Jankowski L, Shepherd J. The official positions of the International Society for Clinical Densitometry: acquisition of dual-energy x-ray absorptiometry body composition and considerations regarding analysis and repeatability of measures. J Clin Densitom. 2013;16(4):520-536.
23. Eijden TM, Korfage JA, Brugman P. Architecture of the human jaw-closing and jaw-opening muscles. Anat Rec. 1997; 248:464–474.
24. T. Abe, C.F. Kearns, T. Fukunaga Sex differences in whole body skeletal muscle mass measured by magnetic resonance imaging and its distribution in young Japanese adultsBr J Sports Med, 37 (2003), pp. 436-440.
25. T. Midorikawa, M. Kondo, M.D. Beekley, et al. High REE in Sumo wrestlers attributed to large organ-tissue mass Med Sci Sports Exerc, 39 (2007), pp. 688-693.
26. S.B. Heymsfield, D. Gallagher, D.P. Kotler, *et al.*Body-size dependence of resting energy expenditure can be attributed to nonenergetic homogeneity of fat-free mass Am J Physiol Endocrinol Metab, 282 (2002), pp. 132-138.
27. T. Midorikawa, O. Sekiguchi, M.D. Beekley, *et al.*A comparison of organ-tissue level body composition between college-age male athletes and nonathletes Int J Sports Med, 28 (2) (2007), pp. 100-105.
28. Alhammer AH, Sadiq GT, and Yousif S. Effect of magnetized water on several biochemical and physical properties in mice. J Babylon Univ Pure ApplSci, (2013). 21(3):910-916.
29. Neto GB, EngraciaFilho JR, de Oliveira BRSM, Coelho CMM,de Souza LFA, and Louzada MJQ. Water treatment bymagnetic field increases bone mineral density of rats. J ClinDensit. DOI: (2017);9:1137-41.
30. Pooja Joshi, Hardeep Kaur. A Descriptive Study to assess the knowledge regarding ill effects of excessive usage of computers and mobile phones on the health of adolescents studying in Sacred Light Senior Secondary School Fatehpur, Rajputan, Amritsar, Punjab. Asian J. Nursing Education and Research. 2019; 9(4):477-482.
31. Rahamat Unissa, Bayyaram Monica, Sowmya Konakanchi, Rahul Darak, Sandagalla Lipi Keerthana, Saranya Arun Kumar. Thalassemia: A Review . Asian J. Pharm. Res. 2018; 8(3): 195-202.
32. Lakshmi Prasanna J., Deepthi B., Rama Rao N.. Rectal drug delivery: A promising route for enhancing drug absorption. Asian J. Res. Pharm.

Sci. 2(4): Oct.-Dec. 2012; Page 143-149.

33. Salma Shaheen, Safia Sultana, Mohammed Nayeem Uddin, Abdul Saleem Mohammad. Principles of Toxicology: A Clinical Review. Asian J. Res. Pharm. Sci. 2018; 8(3):145-150.
34. Amallia Rachmasari, Rafidha Aisyah Kartini, Gita Alviani, Indah Solihah. Healing effect of Spray gel collagen extract from Channa striata bone on burn in rats. Res. J. Pharma. Dosage Forms and Tech.2019; 11(4):275-279.
35. Radhakrishna B, Ashok M, Harish PL, Veera Jyothsna M, Shivalinge Gowda KP. Current and Future Trends of Drugs Used in Osteoporosis. Research J. Pharmacology and Pharmacodynamics. 2011; 3(6): 329-333.
36. Kadiri Sunil Kumar, R. Suthakaran, Ravindar Bairam. Influence of dietary substances on recognition memory in Albino mice. Res. J. Pharmacology & Pharmacodynamics.2018; 10(4): 156-158.
37. Tushar M. Patel, Mukesh C. Gohel, A. Ramkishan. Continuous Tablet Manufacturing Process: As a Part of Lean Thinking. Research J. Pharm. and Tech. 5(10): October 2012; Page 1316-1319.
38. Niveditha, Srikanth, Singh H., Srinivasa R. Antiepileptic drug use and risk of development of fracture - A case control study. Research J. Pharm. and Tech. 6(11): November 2013; Page 1237-1239.
39. Uma Sankarviriti, Swarna Latha Surakala, Arun Satyadev Sidhanadam, Neelima Peela. Influence of HIV, Malnutrition and Patient Non-Compliance on the Prevalence and Prognosis of Tuberculosis: A Fatal Infectious Disease. Research J. Pharm. and Tech. 8(10): Oct., 2015; Page 1365-1368.