Evaluation of Bone Mineral Density and Body Composition in 7-8 years Old Egyptian Males

Thesis

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List of Tables

List of Figures

List of Abbreviations

aBMD	Areal bone mineral density
ALP	Alkaline phosphatase
ATP	Adenosine triphosphate
BA	Bone age
BMC	Bone mineral content
BMD	Bone mineral density
Bmus	Bone multicellular units
C S F	Colony stimulating factor
Calci	Calcitonin related polypeptide alpha
cAMP	Cyclic adenosine monophosphate
DABAS	Dual action bone agent
DEXA	Dual energy X-ray absorptiometry
DRIS	Dietary reference intake
FFM	Fat free mass
FNB	Food &nutrition board
IGF	Insulin growth factor
IL	Interlukin
IOM	Institude of medicine
LBM	Lean body mass
LDL	Low density lipoprotein
LRP5	Low-density lipoprotein receptor related protein 5
M-CSF	Macrophage colony stimulating factor
MEPE	Matrix extracellular phosphoglycoprotein
MK	Menatetrenone
NHANES	National health &nutrition examination survey
OP	Osteoprosis.
OPG	Osteoprotegrin

Pdc	Position development conference
PDGF	Platlet derived growth factor
PGE_2	Prostaglandin E_2
Pi	Inorganic phosphate
PKC	Protein kinase C
PKC	Protein kinase C
PMCA1	Plasma membrane calcium ATPase
Ppar	Peroxisome proliferator activated receptor gamma
PQCT	Peripheral quantitative computed tomography
PTH	Parathyroid hormone
RANK	Receptor activation of nuclear factor kappa
RANKL	Receptor activator of nuclear factor κappa B Ligand
RDA	Recommended dietary allowance
RDI	Recommended daily intake
RGD	Arginin, glycin and asparagines
rhPTH	Recombinant human parathyroid hormone
ROIs	Regions of interest
SD	Standard deviation
SDS	Standard deviation score
SES	Socioeconomic scoring
SIBLING proteins	Small integrin Binding Ligand N – glycosylated proteins
TGF β	Transforming growth factor beta
TNF	Tumer necrosis factor
TRPV6	Transient receptor potential vanilloid6
vBMD	Volumetric bone mineral density
vBMD	lumetric bone mineral density
VDR	Vitamin D receptecepor

Contents

Introduction

Introduction

Bone densitometry is a widely used and universally accepted tool for the assessment of bone mass in adults. In the last two decades, however, interest in bone densitometry in children has increased. This can be explained first by the introduction of more effective treatment regimens aimed at increasing and maintaining bone density in a variety of diseases influencing bone development and or growth and secondly, by the fact that several reports have indicated the importance of peak bone mass in relation to future development of osteoporosis ***(Van Rijn et al., 2006).***

There are 2 main reasons for measuring bone mineral content (BMC) in children: to quantify the deficits in bone mineral associated with the various disorders that cause osteopenia in children and to improve our understanding of the childhood antecedents of osteoporosis, a condition that happens to manifest itself in elderly subjects. Available data suggest that the genetic susceptibility to osteoporosis may be detectable in early childhood ***(Gilsanz and Wren, 2007).***

Measurement of bone mineral density (BMD) by dual – energy x-ray absorptiometry (DEXA) is viewed widely as the preferred method for clinical use in children because of its speed, precision, safety, and wide spread availability. The radiation exposure is comparable to that received during a round trip transcontinental airplane flight ***(Bachrach, 2005).***

DEXA is an attractive option for clinical use that gives estimates of bone mineral mass, fat free mass (FFM), which is approximately equivalent to lean body mass (LBM), and total fat mass (TFM). DEXA exploits the fact that the energy dependency of the strength of interaction between X-rays and bone mineral differs from that for soft tissue. At low energies, bone dominates the attenuation process while, at higher energies, X-rays interact to about the same extent with bone and soft tissue ***(Sala et al., 2006).***

The 3 main limitations of DEXA measurement in children are: (1) the current lack of a standardized pediatric normative database, (2) the lack of a meaningful clinical outcome measure related to DEXA values in children, and (3) inaccuracies resulting from growth -related variations in bone and body size and composition ***(Gilsanz and Wren, 2007).***

Aim of the Work

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The aim of this work is to set a standardized pediatric normative database for BMD and body composition in a representative sample of healthy Egyptian male children aged 7-8 years by DEXA scanning.

Review of Literature