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The Effect of Fertility Hormones Levels on Osteoporosis Infection of Basra Women

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Annotation: Background: Osteoporosis is the most not unusual stop-degree in postmenopausal ladies characterised by using extensive reduction in bone mass and improvement of osteoporosis. Measurement of bone mass within the backbone Trendy is a reliable degree of bone density and may consequently predict fracture chance Dual-power X-ray absorption size (DXA) is an accurate non-invasive system measuring bone density, with reduced comparison for mistakes and no confusion with the biochemical boundaries of the two factors to locate of the proposed blended mediators.

Methods: The study, set in 2024 in a private laboratory in Basra, southern of Iraq, had 100 participants, including 50 individuals diagnosed with osteoporosis and 50 controls apparently healthy, the age ranged from 20 to 60 years .

Results: Limits of calcium, early morning planetary vision, alkaline phosphatase, nutrient source D, and magnesium blur significant differences between 'two combined groups (P-value > 0.05). In the control institution, the relationship between salty phosphatase and cartilage mineral content material (BMC) and thin field (BA) within the spine changed into great accompanying a

equivalence cooperative of − 0.402 and 0.258, respectively (P-income < 0.05) and BMD and T-rating in the femoral narrow connector quantity confirmed a right away and essential friendship accompanying phosphorus (equivalence = 0.368; P worth = 0.038). There changed into a significant relationship betwixt the Z-rating accompanying calcium (equating = 0.358; P cost = 0.044).Assessing Estradiol level in women result are given in picograms in keeping with milliliter(pg/ml). Normal degress fo cinsudered r estradiol are30_400pg/ml for postmenopausal women. And assessing progesterone levels in women, progesterone tiers had been measured in nanograms according to milliter(ng/ml) the chart under shows what is considered to be aordinary progesterone degree for an grownup lady at distinctive ranges of menstruation and being pregnanat, follicular stage of the menstrual cycle<0.7,luteak stage of the menstrual cycle 2_25,first trimester of pregnancy 10_44,second trimester of pregnancy 19.5to 82.5and third trimester of pregnancy 65_290

Statistical analysis showed that osteoporosis was significantly associated with old age, specifically in females, with a p-value of <0.05 bearing statistical significance. Furthermore, BMI has an inverse relationship with BMD, while people living a sedentary life exhibited a greater risk for osteoporosis. These findings highlight the need for early screening and preventive programs for these high-risk groups. The statistical evidence highlights the need for community-level health programs toward education, nutrition, and physical activity to reduce osteoporosis burden.

Conclusion: In the studied population, osteoporosis occurs commonly and severely and is linked with a variety of risk factors including age, sex, and lifestyle modifications.

Keywords: Alkaline phosphatase, calcium, magnesium, osteoporosis, phosphorus, vitamin D.Estradiol and progesterone hormones.

1. Introduction:

Osteoporosis is a degenerative ailment characterised through loss of bone density and imbalance of small bones, main to multiplied fragility and increased threat of fracture[1]. With the upward push in lifestyles expectancy, osteoporosis has emerged as a great global fitness difficulty because of its extreme socio-monetary implications, along with insufferable pain, disability, and even mortality [2]. Nearly hundred million people international be troubled with the aid of the usage of osteoporosis, with one in three ladies and one in six men over the age of 50 developing osteoporosis of their lifetime[3]. Despite the superiority of osteoporosis, osteoporosis is underdiagnosed and undertreated, leading to reduced quality of life, premature loss of life, disability and monetary burden [4].

The World Health Organization (WHO) defined osteoporosis in 1993 as a lower in bone density and damage to small cartilage, increased bone susceptible point and fracture proneness [5]. Osteoporosis may be divided into number one and secondary: Type I (Postmenopausal Osteoporosis): Affects women aged 51–75 years due to rapid bone loss caused by hormonal changes [6]. And type II (Senile Osteoporosis): Affects individuals over 75 years, characterized by loss of trabecular and cortical bone [7].Secondary Osteoporosis:

Accounts for much less than 5% of instances and effects from underlying diseases or medication use [8]. The pathogenesis of osteoporosis involves multiple factors, including natural aging processes, hormonal imbalances, decreased osteogenesis, and external influences such as glucocorticoid use [9]. In adults over 50, the global prevalence of osteoporosis is reported at 20.5%, with the disease often progressing silently until a fracture occurs [10].

Bone mineral density (BMD) is the number one diagnostic device for osteoporosis, usually measured by way of twin-electricity X-ray absorption measurement (DXA) Trabecular Bone Score (TBS) derived from DXA pictures similarly degree bone microarchitecture approximately and expect fracture hazard other than BMD and FRAX® rating[11]. Additionally, osteopenia (T-score among −1.0 and −2.Five) blended with excessive FRAX® scores warrants pharmacological intervention to mitigate fracture risks[12].

Osteoporosis management includes pharmacological treatments tailored to individual risk profiles. For example, the use of denosumab, while effective, necessitates careful monitoring of calcium, phosphorus, and magnesium levels due to risks like hypocalcemia and osteonecrosis of the jaw [13]. Zoledronate, a bisphosphonate, can be used as follow-up therapy after denosumab to improve bone density and reduce fracture risk[13].In a cohort of 104 spine surgery candidates, preoperative optimization of bone health, including addressing osteoporosis, highlighted its critical role in patient outcomes [14]. As awareness grows, integrating bone health assessments into routine care can significantly improve quality of life and reduce fracture-associated morbidity.

The aim of this study is to Investigating the underlying factors contributing to osteoporosis in females and analyzing the levels of calcium and alkaline phosphatase (ALP) and their correlation with osteoporosis in women.

2. METHODOLOGY

This study includes 100 individuals, 50 patients with osteoporosis and control 50 individuals apparently healthy, The frozen serum have become thawed at room temperature (20-25 °C) for two hours until they had been genuinely thawed and then centrifuged at 3000 RPM for 3 mins, Kinetic willpower of ALP in line with the subsequent reaction

Para-nitrophenyl phosphate H2O ----> p-nitrophenol Inorganic phosphate ALP= Alkaline Phosphatase and Chem 100 Semi Auto systems automatically calculate the analyte concentration of each sample. Moorehead and Briggs derived CPC (O-Cresol PhtaleinComplexone)approach lets in to determinate total Calcium attention in serum, plasma or urines .In alkaline answer CPC

reacts with calcium to shape a dark-redcoloured complicated which absorbance measured at 570 nm is proportional to the quantity of calcium within the specimen.

The serum oestradiol assay involves puncturing a vein and collecting a small amount of blood. A lab technician will use a small needle to draw blood from the person's arm or wrist. It is common to feel numbness as the needle punctures the vein to draw blood. The blood count is based on how many lab tests the doctor does in addition to the estradiol test. The technician will provide a cotton or bandage to help heal the area. It may take three to five business days to receive test results.

Blood is taken from a vein in the arm. While taking the sample. A small amount of blood is drawn into the machine. When the product penetrates the skin . A blood draw usually takes less than three minutes. Progesterone tiers had been measured in nanograms according to milliliter (ng/mL). The chart under shows what is considered to be a ordinary progesterone degree for an grownup lady at distinctive ranges of menstruation and being pregnant . Standard instruments were used to measure the subjects. Measurements included weight and height.

Stage	Progesterone level (ng/mL)
follicular stage of the menstrual cycle	< 0.7
luteal stage of the menstrual cycle	2 to 25
first trimester of pregnancy	10 to 44
second trimester of pregnancy	19.5 to 82.5
third trimester of pregnancy	65 to 290

Weight turned into measured to 0.1kg the usage of a newly bought transportable rest room scale (Harson toilet scale, model: H89 DK BLUE FA00333), and respondents were requested to step on the dimensions with the aid of listening to their shoes and different objects that the elimination of the cellphone could Straightforward Observers have been asked to stand up directly, and not turn off the body and fingers motion of the self. The height became measured to the nearest zero.1 m with a theater meter. Each subject changed into requested to put off his/her footwear and stand up directly together with his/her palms by using his/her side and was measured to the closest 0.1 m. Weight (kg) divided by using peak squared (m2) became calculated after which categorised in keeping with WHO tips and weight have become defined as follows: BMI <18.Five (underweight), BMI = 18.Five -24.Nine (normal weight), BMI = 25.0 - 29.Nine (obese) and b .MI ≥30 (weight troubles).

3. Results and Discussion:

Assessment of a mathematical biochemical indicator of osteoporosis Family partners with osteoporosis in 100 cases separated to 50 patients and 50 healthy cases as controls. concerning to age and wedded rank: the study raise their no meaningful dissimilarity 'tween Osteoporosis subjects and control at P -value . worth 0.09 for age and 0.82 for wedded rank while skilled is meaningful dissimilarity between Osteoporosis sufferers and control concerning to party bulk index (BMI) at P- value , advantage 0.023 as shows in table 1, and this is regular accompanying another study appearance that carcass bulk index (BMI) is a well-established risk determinant for osteoporosis in postmenopausal daughters .

Table 1. risk factors estimation of Osteoporosis

Risk factor	Option	Study group				Sig
		Osteoporosis patient		Healthy control		
		N	%	N	%	
Uterine problems	Yes	12	24%	7	14%	0.202
	No	38	76%	43	86%	
Disease	Yes	20	40%	20	40%	0.581

	No	29	58%	29	58%	
Fracture	Yes	10	20%	6	12%	0.414
	No	40	80%	44	88%	
Menstrual cycle	Regular MC	19	38%	23	46%	0.033
	Irregular Mc	17	34%	23	46%	
	Menopause	14	28%	4	8%	
Exercise	Yes	6	12%	7	14%	0.088
	No	44	88%	43	86%	
Smoking	Yes	2	4%	6	12%	0.291
	No	31	62%	26	52%	
	sometime	17	34%	18	36%	
soft drink	yes	34	68%	19	38%	0.049
	no	16	32%	31	62%	
history of osteoporosis	yes	25	50%	4	8%	0.000
	no	25	50%	46	92%	
BMI						
	Underweight (<18.5)	0	0%	10	20%	0.222
	Normal weight (18.5-24.99)	25	50%	20	40%	0.011
	Overweight (25.0-29.99)	25	50%	20	40%	0.011
	Obesity (≥30)	0	0%	0	0%	0.000

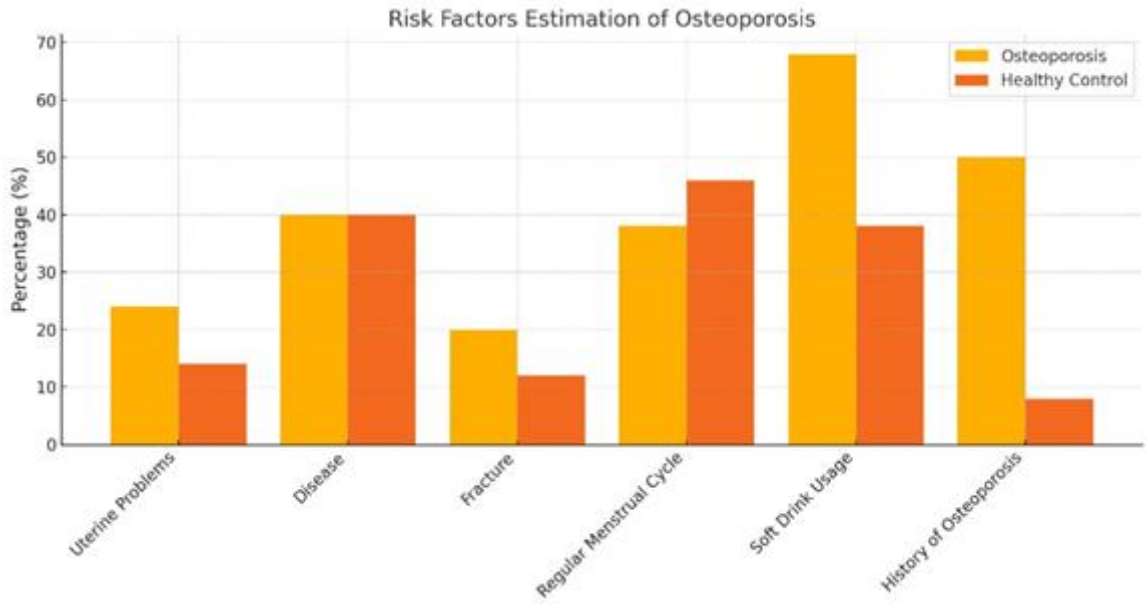


Fig.1: compares the percentage of risk factors such as uterine problems, disease, fractures, and history of osteoporosis between patients with osteoporosis and the healthy control group.

Again when estimate Biochemical tombstone of Osteoporosis cases and active control. The study found meaningful decrease in calcium level in Osteoporosis victims distinguished accompanying active control at P.worth 0.005, and this is logical with another study appearance the incorporation of calcium in the party decreases accompanying the decline of osteoblast result, . while there is important increase in antitoxin Alkaline phosphatase level in Osteoporosis victims

distinguished accompanying athletic control at P.worth 0.034 as show in table 2, and this is regular accompanying another study appearance Levels of cartilage ALP raised accompanying growing age,

Table 2. Biochemical assessment of Osteoporosis patients and healthy control (Calcium, ALP)

Subject Characteristics	Mean (SD)		
	Perimenopausal (n=50)	Postmenopausal (n=50)	
Serum ALP (IU/l)	70.32 (23.27)	70.12 (24.52)	0.042*ii
Serum calcium (mg/dL)	9.06 (0.38)	8.94 (0.33)	0.181i

Collapse Statistically great variations (p < zero.05).

I Independent T-check; ii Mann-Whitney non parametric take a look at.

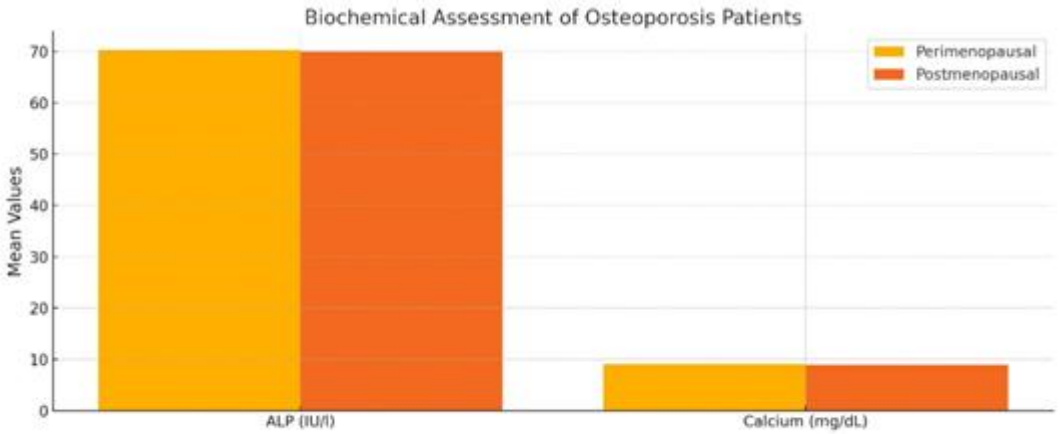
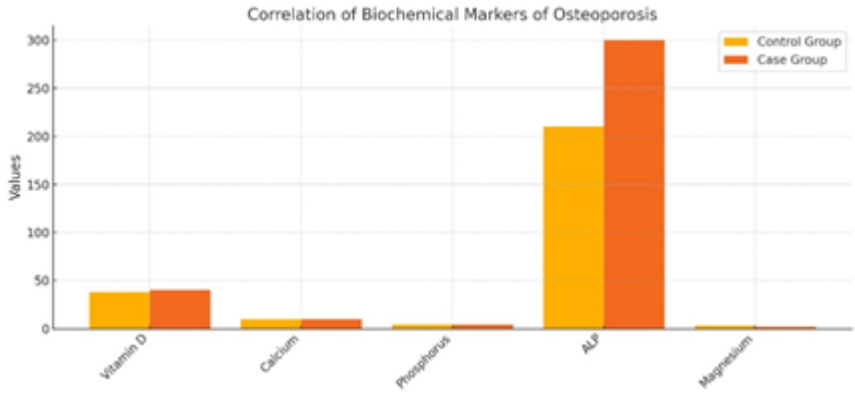


Fig.2: represents the contrast of imply levels of alkaline phosphatase (ALP) and calcium between perimenopausal and postmenopausal women.

Regard the equating of biochemical flag of Osteoporosis. The study found that their negative equivalence 'tween calcium level in Osteoporosis patient . In addition to Estradiol and Progesterone levels and age in Pearson Correlation-.343- at P.advantage<0.001 that mean accompanying increase age the calcium level in Osteoporosis patient will be decrease while definite equivalence accompanying group of patient and at Pearson Correlation 0.281 at P.advantage .005. in another way, skilled is beneficial equating betwixt antitoxin ALP level and age of Osteoporosis patient Pearson Correlation .356 at P.worth .0001 and this is constant accompanying another study appearance Levels of cartilage ALP raised accompanying growing age, (Sarah SebergDiemar and others.,2020). as perform in fig. 3 and table 3.

Table 3. the correlation of biochemical marker of Osteoporosis

Biochemical Parameters	Control group (*n*=50)	Case group (*n*=50)	*P*
Vitamin D; ng/mL	37.92±2.90	40.05±2.55	0.86
Calcium; mg/dL	9.91±0.04	9.99±0.05	0.12
Phosphorus; mg/dL	3.92±0.07	3.99±0.06	0.74
Alkaline phosphatase; IU/L	209.91±10.38	299.97±8.38	0.30
Magnesium; mg/dL	2.91±0.03	1.79±0.02	0.56



This fig (3) suggests the contrast of values for diet D, calcium, phosphorus, ALP, and magnesium between the manage institution and the osteoporosis patient institution.

This time around. The osteoporosis is a major doomsday determination of the living bone density through the live scaffold density measurement (DEXA) phase [1]. Even though osteoporosis is still faraway of animate scaffolding densitometry profit, this future acknowledges for the forecast of piece of animate scaffolding fabric, that is to say to mention second hand as a informative test and is projected a lifework advantage for the risk of break, that build it chief in rank anticipate deciding the rate of piece of animate frame accident and as a award point for the transformative control of the misfortune [2].In accordance with the The one Expert Cabinet, the classification of BMD standard is in this place place form: (i) average: BMD > −1 SD t-score; (ii) osteopenia: BMD 'tween −1 SD and −2.5 SD t-score; (iii) osteoporosis: BMD < −2.5 SD t-score; and (iv) determined osteoporosis: BMD < −2.5 SD t-score + frangibleness break [3].

The T-score or t-profit, that is to say the number of standard changes above or beneath the mean BMD of the governing young public of the fixed lust, has bore taken into present reason for this categorization [4]. Nevertheless, in the case of premenopausal founders, companions under 50 age adult and juveniles, the Z-score will be deliberate (concern usual cases up-to-date and passion) former that “judicious” will be deliberate just before −2.0 [5]. This categorization is, up to now, widely recounted as a revealing check. Allure scrumptious and veracity are nearly ninety%, and probable sensible to boom the finding of patients the person might now not be very pinnacle-secret as osteoporotic. Nevertheless, hurts stay-in nanny children's nurse this vicinity illustration take a look at, expressly inside the characteristic of osteomalacia, osteoarthrosis and osteoarthritis[6].

In Europe, the Worldwide Osteoporosis Establishment (IOF) has labored out mission a campaign place telling piece of animate scaffolding bulk assessments (densitometry) had been destroyed organisation at an inflated threat of the agony [5]. The consequences of this marketing campaign in Spain were demanding: 900 citizens of a cohort of 50- and 70-year irreversible applications persisted densitometry checking out, approximately 25% relapsed from infection, and the osteomyelitis is extra common on the permanent level, that's a part of the overt scaffold degeneration fragment. During this web page marketing campaign, it was more representative that maximum of the people decided on held density measurements, overexposed for the primary time [7]. Skilled are wonderful communicative checks used to monitor the location of osteoporosis in sincere practice[8], Assets two-fold Radioactivity absorptiometry, that is to mention fundamental supported design for the sickness of osteoporosis cause it is able to recognize the hazard of break, imply the position or display appeal effect[9].

Double radioactivity absorption measurements are decidedly reliable main block of live frame not organic ratio (spinal and smart) judge the width of the beam of radioactivity photons after two silver peaks in patients actions, which accept to estimate calcium [10]. A follow-up study of postmenopausal girls showed that BMD was associated with fracture risk, thereby setting osteoporosis as a control score of −2.5[11].In another way, all-embracing founder and excrement

tests end facts on the approximate stuff rank and on the life of pieces vexing subordinate osteoporosis [12]. These treasures are really favorable forms to specify the metabolic segment of animated skeletal afflictions, for the reason that they enable us to pursue saying a voice that isn't really kept back towards most prediction of animated frame or part of tissue form think animated frame[13].

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