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Assessment of hormonal profile and diet in relation with primary infertile females in Baghdad City- 2019 --Manuscript Draft--

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Abstract:	<p>Diet, stress, exercise and smoking affect female fertility, Mediterranean healthy diet has a success rate among woman is attempting fertility. Assessment of hormonal balance and dietary pattern among primary infertile women in Baghdad City- 2019 In this study, 200 of early primary infertile women (12-18) months of marriage were interviewed and hormonal assessment was done at (4) and (21) days of the cycle, in Baghdad City-2019The study revealed that most of females were between 18-30 years, 30% were over 30 years, half of them were housewives, from urban areas but less than half were graduated. Mean of body mass index was (32±3) that 40% was overweight and 20% was obese. Half of them had anxiety and irregular intake of supplements. About 20% of them were smokers and all of them had no exercise. Forty percent of them had increased in the level of FSH, LH; within mean average was (15±2.7), (10±2.8) respectively and strong correlation according to age, education, BMI while there was average correlation according to diet and supplements for FSH hormone and poor correlation for LH hormone. Fifty percent of females had increased in the level of prolactin with mean average was (24±2.50 while 40% had increased in the serum level of AMH with mean average was (5±2) ml/dl that both hormones had strong correlation with age, education, BMI, diet and supplements. 70% of them had decreased in the level of DHEA and D3 with mean average was (40±5 ml/dl), (28±5ml/dl) respectively, with poor correlation with age and strong correlation with education, diet and supplements while according to BMI, there was strong correlation with D3 and moderate correlation with DHEA . There was normal level of testosterone and TSH with average mean was 35±0.5 ml/dl and 1.7 ±0.5ml/dl respectively</p>

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Assessment of hormonal profile and diet in relation with primary infertile females in Baghdad City- 2019

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Abstract

Diet, stress, exercise and smoking affect female fertility, Mediterranean healthy diet has a success rate among woman is attempting fertility. Assessment of hormonal balance and dietary pattern among primary infertile women in Baghdad City- 2019 In this study, 200 of early primary infertile women (12-18) months of marriage were interviewed and hormonal assessment was done at (4) and (21) days of the cycle, in Baghdad City-2019 The study revealed that most of females were between 18-30 years, 30% were over 30 years, half of them were housewives, from urban areas but less than half were graduated. Mean of body mass index was (32±3) that 40% was overweight and 20% was obese. Half of them had anxiety and irregular intake of supplements. About 20% of them were smokers and all of them had no exercise. Forty percent of them had increased in the level of FSH, LH; within mean average was (15±2.7), (10±2.8) respectively and strong correlation according to age, education, BMI while there was average correlation according to diet and supplements for FSH hormone and poor correlation for LH hormone. Fifty percent of females had increased in the level of prolactin with mean average was (24±2.50) while 40% had increased in the serum level of AMH with mean average was (5±2) ml/dl that both hormones had strong correlation with age, education, BMI, diet and supplements. 70% of them had decreased in the level of DHEA and D3 with mean average was (40±5 ml/dl), (28±5ml/dl) respectively, with poor correlation with age and strong correlation with education, diet and supplements while according to BMI, there was strong correlation with D3 and moderate correlation with DHEA . There was normal level of testosterone and TSH with average mean was 35±0.5 ml/dl and 1.7 ±0.5ml/dl respectively

Key Words: Primary infertile women, Hormonal assay, Dietary pattern. **relation with primary, infertile females**

Introduction:

Dietary factors are the major health significance, which influence female fecundity. (3) Healthy food is a guideline for fertility as intake of 1,000 kc, green vegetables, whole beans in state of legumes, seafood and plant origin proteins in state of animal protein, olive oil in states of gee. (4) Mediterranean food (whole grains, dairy

products, soy- bean, seafood, green vegetables omega-3 and olive oil) are important to avoid anovulation. High dose of supplementary folic acid, vitamin D and B12 have positive effects and assist fertility outcomes, (5) while rich diet in CHO, sweets, red meats and saturated fat have negative effects on fertility. (6), (7) Intake of caffeine more than 200ml/day may has effect on fertility, (8) that intak caffeine and infertility is still unclear. (9) Intake of high doses of supplements that contain 1.0 mg of folic acid for many months pre- conception, increase the chance of fertility, (10) with maintenance of healthy food rich in folate and supplements reduce the defect of neural tube. (11) Many recommendations are noted to avoid food contamination with pesticides that effect fertility. (12)Vitamin D supplements effect on endometrial thickness and lipid profile in women with poly cystic ovary syndrome and decrease incident of endometriosis. (13)

Objectives of the study: Assessment of hormonal assay and dietary pattern among primary infertile women in Baghdad City- 2019

Materials &methods: In this study, 200 of primary infertile women (12-18) months of marriage were interviewed and hormonal assessment was done during (4) and (21) days of the cycle.

- Sampling was chosen by using convenience non- probability sampling.
- Mean, standard deviation (SD) and correlation coefficient was calculated by using SPSS Version 26. Confidence level was 99% and p value was 0.01 [17-25] .
- Researchers had designed an interview questionnaire form that contains demographic characteristics as age, education, marital and job status.
- TOSOH AIA 360 Immunoassay Analyzer Machine used to assess blood level of hormones.
- Reference range of hormones: - FSH (Follicular Stimulating Hormone) is (3-10) IU/L and LH (Luteinizing Hormone) ,[35-41] is (2-8) IU/L (during early follicular phase).
- Estradiol: level is 30-40 pg/ml (4 day of cycle). Progesterone: if the range is <10 nmol/L means unlikely ovulation (20-23 day of cycle). Prolactin: level is <25 ng/L
- Testosterone: level is 15-70 nmol/dl. DHEA sulfate: At age (20-29), the level is (65-380) (µg/dL), at age (30-39) is 45 to 270 µg/dl. Vitamin D3: level is >30 ng/ml. TSH (Thyroid Stimulating Hormone): level is 0.5-5 u IU/dl. (14) (15)

Results:

Table (1): Distribution according to socio- demographic characteristics showed that 70% were between 18-30 years, 30% were over 30 years, 30% completed 2nd school and graduated, 50% was from urban areas, housewives and anxious . Mean of body mass index was 32. ±3 that (40 %) was overweight and (20%) was obese. About 20% were smokers and all of them were lack of exercise. 50%hadsupplements

Table (1) Distribution of patients according to socio demographic characteristics

Characteristics	Groups	No. (total=200)	
		%	
1.Age	<30years	140	70
	>30 years	60	30

2.Education	Primary school	80	40
	secondary school	60	30
	graduated	60	30
3.residence	Urban	100	100
	rural	100	100
4.Occupational status	Work	100	50
	Housewife	100	50
Body mass index	<u>Normal</u>	80	40
	<u>over weight + obesity</u>	120	60
6.Anxiaty	<u>Present</u>	100	50
	<u>Absents</u>	100	50
7. 5.Smoking cigarette	<u>Yes</u>	40	20
	<u>No</u>	160	80
8.exercise	<u>Yes</u>	----	-----
	<u>No</u>	200	100
9. Supplements	<u>Yes</u>	100	50
	<u>No</u>	100	50

Table (2): Distribution of hormonal assay showed that forty percent of them had increased in the level of FSH, LH, within mean average was 15 ± 2.7 , 10 ± 2.8 respectively. Forty percent had increased of prolactin level with mean average was 24 ± 2.5 [42-43] . For AMH, 40% had increased level with mean average was 5 ± 2 m/dl. There was normal level of testosterone with mean average 35 ± 0.5 ml/dl. The mean of DHEA was 40 ± 5 ml/dl, D3 was 28 ± 5 ml/dl, estradiol average mean (at 4 day of cycle) was 40 ± 5 ml/dl, and progesterone mean (at 21 of cycle) was 10 ± 3 ml/dl. For TSH the average mean was 1.7 ± 0.5 ml/dl.

Table (2) Distribution of hormonal analysis

Hormones	Mean	SD	Average	No.	%
FSH	15	2.7	Normal	120	60%
			Increase	80	40
LH	10	2.8	Normal	120	60%
			Increase	80	40%
AMH	5	2	Normal	120	60%
			Increase	80	40%
Testosterone	35	0.5	Normal	200	100%
DHEA	40	5	Normal	60	30%
			Decrease	140	70%
D3	28	5	Normal	60	30%
			Decrease	140	70%
TSH	1.7	0.5	Normal	200	100%
Prolactin	24	2.5	Normal	100	50%
			Increase	100	50%
Estradiol	40	5	Normal	100	50%
			Decrease	100	50%
progesterone	10	3	Normal	100	50%
			Decrease	100	50%

Table (3): correlations between age, education, diet, supplements and **hormonal**

		FSH	LH	PROLACTIN	AMH	D3	DHAE
AGE	Pearson Correlation	.782**	.841**	.732**	.732**	.434**	.423**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	69.000	57.000	60.000	60.000	18.300	17.700
	Covariance	.347	.286	.302	.302	.092	0.089
	N	200	200	200	200	200	200
EDUCATION	Pearson Correlation	.856**	.822**	.942**	.942**	.718**	.701**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	137.000	101.000	140.000	140.000	54.900	53.100
	Covariance	.688	.508	.704	.704	.276	.267
	N	200	200	200	200	200	200
BMI	Pearson Correlation	.860**	.831**	.896**	.896**	.708**	.692**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	124.000	92.000	120.000	120.000	48.800	47.200
	Covariance	.623	.462	.603	.603	.245	.237
	N	200	200	200	200	200	200
DIET	Pearson Correlation	.691**	.487**	.732**	.732**	.988**	.988**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	61.000	33.000	60.000	60.000	41.700	
	Covariance	.307	.166	.302	.302	.210	.208
	N	200	200	200	200	200	200
SUPPLEMENT	Pearson Correlation	.691**	.487**	.732**	.732**	.988**	.988**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	61.000	33.000	60.000	60.000	41.700	41.300
	Covariance	.307	.166	.302	.302	.210	.208
	N	200	200	200	200	200	200

** Correlation is significant at the 0.01 level (2-tailed).

Table (3): correlations between age, education, diet, supplements and hormonal assay showed that the correlations coefficient between age and hormonal profile was 0.782 for FSH, 0.841 for LH, 0.732 for Prolactin and AMH, 0.434 for D3 and .423 for DHAE. According to education, the correlations coefficient was .856 for FSH, 0.822 for LH, 0.892 for Prolactin and AMH, 0.718 for D3 and .701 for DHAE. According to BMI, the correlations coefficient was .860 for FSH, 0.831 for LH, 0.896 for Prolactin and AMH, 0.708 for D3 and .692 for DHAE. According to diet and supplements, the correlations coefficient was .691 for FSH, 0.487 for LH, 0.732 for

Prolactin and AMH, 0.988 for D3 and .988 for DHAE.

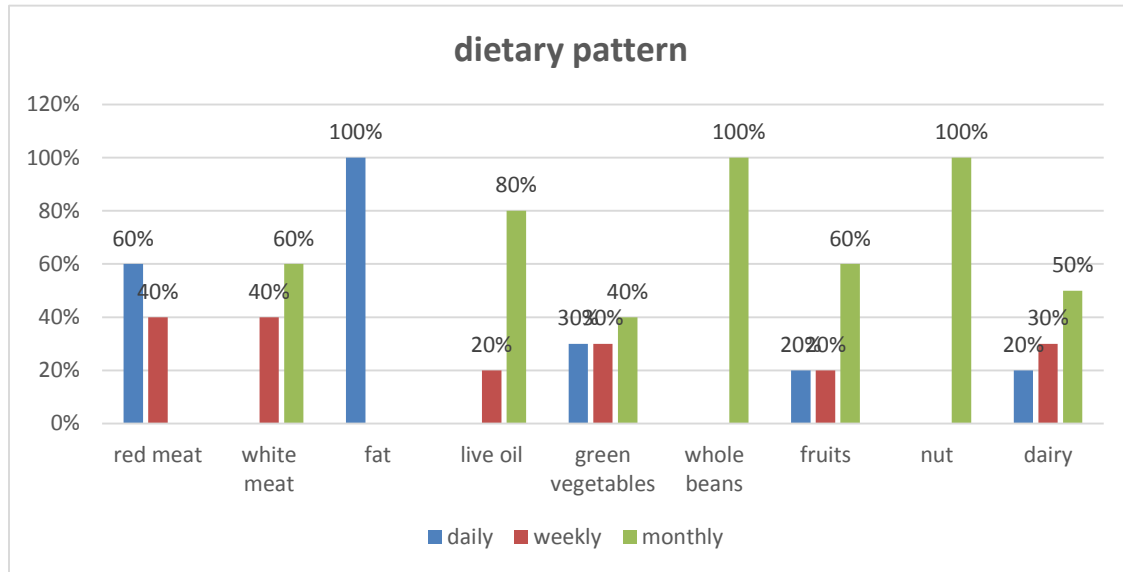


Figure 1 : Distribution of dietary pattern

Figure: Distribution of dietary pattern showed that 60% had red meat daily and 40% weekly. 40% had white meat weekly and 60% monthly. 100% had fat daily and gee weekly. 20% had olive weekly and 80% monthly. 20% had intake of green vegetables daily and weekly. 100% had whole grains and nuts monthly. 20% had dairy daily and 30% weekly while 50% was monthly. For tea intake of them had it more than 3 times/day.

Discussion: Half of the studied women were from urban regions, workers and less than half of them were graduated, this agreed with other studies that 50% of women were educated from urban regions and (44.3-50%) were workers. (16). Statistical results showed that there was a positive correlation between the level of hormones and the aging which could disturb the function of ovary and fertility. (17) Body mass index was 32.3 that more than half of them were overweight and obese with strong correlation with hormonal imbalance, this agreed with other study showed that there was an association between obesity and infertility with high prevalence of obesity among infertile women. (18) High body mass index will increase the production of estrogen and reduce the chance of pregnancy.(19) The study showed that there was a correlation between hormonal imbalance – diet and supplements, in another study they found that supplements improved sex desire, orgasm and sexual intercourse, (20),(21) others found that supplements increased in the mean of progesterone level from 8.2 to 12.8 ng/mL during mid luteal phase. (22) In this study there was high percentage of vitamin D deficiency which might effect on fertility that calciferol decreases the incidence of endometriosis, primary hypogonadism, myoma, and reduces serum lipids in females with polycystic ovary syndrome. (23), (24) Even of high dietary intake of fat, there was imbalance of the level of DHEA, estradiol and prolactin, that fat has an influence effect on the concentration of these hormones , (25), this might be due to intake of poly-unsaturated fatty acids and gee. (26) DHEA supplementation has a positive effect on hormonal balance, endometrium, and the number retrieval of ova. (27) before 12 weeks of IVF protocol, now a day gives of 25 mg micronized DHEA/day to success of pregnancy. (28) The study showed that less than half of females had

high level of AMH and prolactin that Anti-Müllerian hormone is the best marker for age assessment of the ovarian pool and predicts the lifespan of reproduction. (29) High prolactin level might stop or slow ovulation process or could effect on progesterone level which was responsible for endometrial thickening after ovulation. (30) The study showed that there was poor intake of healthy reproductive food and part of them were smokers, this agreed with other study showed that more than half of infertile females had poor intake of healthy reproductive diet , had intake of tea more than 3 times/day and were smokers. (31), while intake of Mediterranean reproductive diet achieves pregnancy successfully. (32)

Conclusion: Most of females had poor healthy reproductive diet and less than half of them had hormonal imbalance with positive correlation with aging, BMI, diet, and supplements. . Progesterone level (at 21 of cycle) was 10 ± 3 nm/dl while estradiol level (4 days of the cycle) was 40 ± 5 pg/dl. For dietary pattern, the study showed that there was poor intake of healthy reproductive food, as high intake of carbohydrate, sweets and gee with poor intake of seafood, fruits, vegetables and other reproductive food. There was high intake of tea for several times with sugar. Inclusion criteria: primary infertile women during (12-18) months of marriage. Exclusion criteria: chronic disease, male infertility Most of females had poor healthy reproductive diet and less than half of them had hormonal imbalance with positive correlation with agingBMI, diet, and supplements.

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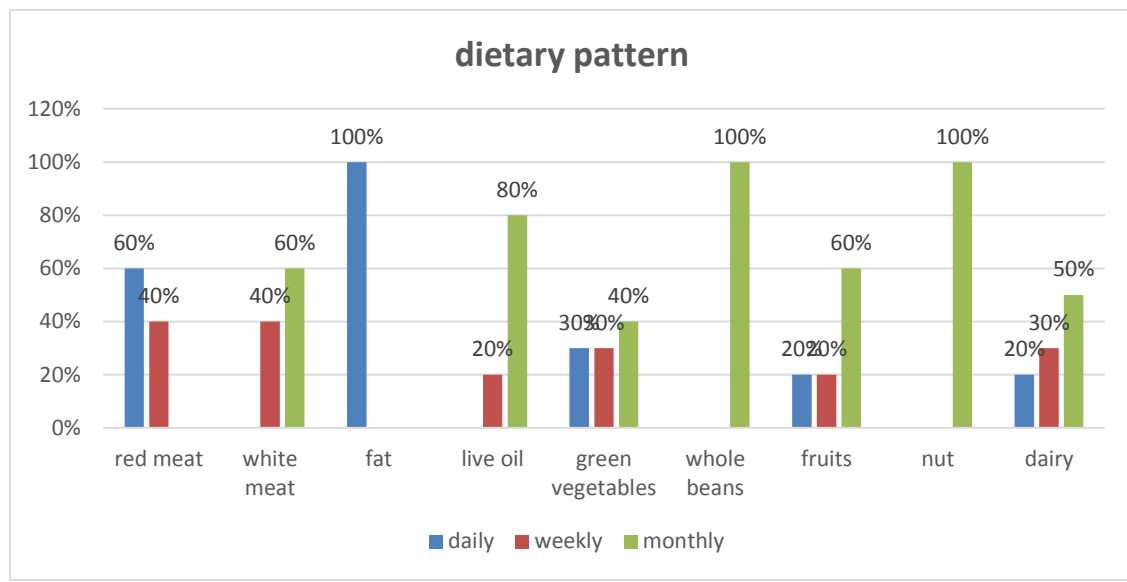


Figure 1 : Distribution of dietary pattern

Credit Author Statement

Ban Nadhum Abdul Fatah : Conceptualization, Methodology, Software ,Data,
curation.Investigation ,Supervision , Software,

Badeae Thamer Yahya : Validation , Writing- Reviewing , Editing.Writing- Original draft
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Declaration of interests

The authors declare that they have no known competing financial interest or personal relationships that could have appeared to influence the work reported in this paper.

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