ASSESSMENT OF POST COITAL TEST IN FEMALES WITH UNEXPLAINED INFERTILITY IN BAGHDAD CITY 2018-2019

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ABSTRACT

About 200 to 300 million of sperms transverse from vagina to the cervix, only few hundreds of them can achieve the oocyte.

The aim is the assessment of post coital test in females with unexplained infertility.

In this study, 260 infertile women during 14-16-day of the cycle were considered. The women were subjected to the post-coital test at 2 hours after intercourse. The study was conducted in Baghdad during the period from January – April, 2018-2019.

The study revealed that less than half of females were over 35 years and more than half were educated from urban areas and housewives while half of them had recurrent urinary tract infection, vaginitis, diabetes mellitus and less than that had positive family history, anxiety and hypertension. About interventions, 30% of females had cautery, D&C, IUI and less had IVF. 100% had taken clomiphene drug. The mean of BMI was 32.5±2.5. Ultrasound monitoring was done, there were normal findings with patent tubes except part of cases had picture of polycystic ovarian syndrome and ovarian failure. For post coital test, small percentage was with normal amount and consistency (score 3) and high percentage was with abnormal spinnbarkheit and ferning tests, (mostly score 0 & score 1). 75% of cases had acidic vagina with dead non motile sperms while 25% with alkaline vagina with average of 40% progressive active sperms, 30% Moderate progressive Liner motility with highly significance (P value<0.05). For cellularity 70% was less than 6-8/HPF. For sperm activity only 30% were motile sperms. For sperm count (3 days’ absence), 30% had mild oligospermia, 20% had moderate oligospermia and 10% had severe oligospermia. Most of females had normal hormonal assay but there was gross deficiency in the level of DHEA and D3 (average mean was 90±5µg/dl, 25±2 IU respectively) with small part of them had elevation in FSH and Testosterone hormones. For dietary pattern, most of females had dairy product, salt, tea with sugar daily, more than half of them had acidic food, fast food, dried food, gas drinking daily while part of them had intake of fruit weekly and vegetables monthly. Half of them were smoking cigarette weekly.

High vaginal acidity, impairment of cervical mucous with deficiency of DHEA and D3 in the females and oligospermia in the males should be considered in case of unexplained infertility.

Keyword: Post coital test, female with unexplained infertility, spermatozoa

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INTRODUCTION

Examination of cervical mucus and vaginal pH are necessary during evaluation of infertility, because they respond for 5–10% of all infertility cases (1,2) that abnormalities of cervical mucus can cause unexplained infertility (3). When pH of the vagina is less than 6.0, there will be severe reduction in sperm motility. Infections, polycystic ovarian syndrome, interventions (cauterization, D&C) can cause cervical constriction, impair mucus production and reduce mucosal receptivity of cervix (5,6). There are hormonal fluctuations during the cycle which effect the composition and production of that effect on sperm penetrability (7). Clomiphene citrate intake and smoking can effect on receptivity of mucus to sperm (8). By sexual excitement, the vagina produces a transudate and lubricates which elevate the vaginal pH to 7.0 within few seconds, spermatozoa are taken by the cervical mucus and leaving behind the plasma (10). Sperm movement is passive due to the coordination of contractions between vagina, cervix, and uterus (11) even are of short duration, they are believed to be the responsible for the sperm progression into female reproductive system (12,13). Motility of most vaginal sperm is diminished within about 30 minutes, and almost all sperm motility has been lost within 2 hours (14). With polycystic ovary, there is difficulty to produce stretchy watery mucus for sperm penetrability (15). Clomiphene citrate has anti-estrogenic action with adverse effects on the cervical mucus (16,17). Even of passive smokers, nicotine can be found in the mucus (18). Prostaglandins have variation in the cervical mucus during the menstrual cycle, so evaluation of PGE2 levels in cervical mucus with female has unexplained miscarriages is important (19). A high intake of vegetables and fruits with drinking a lot of water with decrease intake of acidic food, processed and dairy food, sugar, soda and meat will lead to more alkaline vagina and healthy cervical mucus (20). The post-coital test examines the interaction between sperm and mucus of the cervix that examines sperm survival in cervical mucus migration into the reproductive system. The test is done in 2 days before ovulation and after 2 days of sexual abstinence. The presence of any for-ward motile sperm suggests mucus–sperm interaction and normal cervical mucus (21). During ovulation the estrogen stimulates mucin components by producing of abundant, watery, thin mucus with ferning capacity and possesses a high spinnbarkheit (22).

The objectives of the study: Assessment of post coital test in females with unexplained infertility.

MATERIALS AND METHODS

Population & Sample size

An interview had done by using convenience non probability sampling. An interview questionnaire form had been designed by researcher that bases on: 1. Demographic characteristics that include age, education, job status. 2. History of diseases, family history, smoking status, stress. 3. History of operations, infection, medication. Post Coital Test

Total 260 infertile women with 14-16 day of cycle were considered. The women were subjected to the Sims-Hunter post-coital test at 2 hours after intercourse. During the ovulatory period. Each couple was instructed to abstain from sexual intercourse for 3 days prior to the test. Several hours later (usually 2), the woman was examined by us, the mucus was aspirated from cervical canal and spread on a glass slide. Cervical mucus was examined for amount, consistency, spinnbarkheit, ferning, cellularity, pH, and the post-coital status of the spermatozoa that (10-50) motile sperms/HPF are considered normal. This study was done in Baghdad during the period from January – April, 2018-2019.

Scores : 0 1 2 3

Amount: 0 ml 1 ml 2 ml 3 ml
Consistency: Thick mucus moderate M. thin M. watery M.

Spinnbarkheit: Less than 11-4 cm 5-8 cm more than 9 cm

Ferning: No crystals A typical C 1-2 stem 3-4 stem

Cellularity: more than 11 / HPF 6-8 / HPF 1-5 / HPF 0 cell (24)

For sperm count

Mild oligospermia: concentrations 10 million – 15 million sperm/ml
Moderate oligospermia: concentrations 5 million – 10 million sperm/ml
Severe oligospermia: concentrations less than 5 million sperm/ml (25).

Body Mass Index

A tape measure and a weighing scale used to estimate the height and weight and calculated the BMI for each female according to the formula: BMI = Weight / Height² (Kg/m²). BMI ranges as the following: underweight < 18.5 kg/m², normal weight: 18.5-25, overweight: 25-30, obese > 30. (26) WHO cut-off point for overweight is 25 kg/m² (26).

Statistical Applications

Statistical tests were applied by using SPSS Version 22 that measured mean, standard deviation, x². Confidence Level was 95%.

RESULTS

Table 1 shows the distribution according to socio demographic characteristics, showed that 65% were between age 18-35 years, 35% were over 35 years, 65% were educated and housewives. 69% was from urban areas.

Table 1: Distribution of patients according to socio demographic characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Groups</th>
<th>No. (total=260)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Age</td>
<td>&lt;35 years &gt;35 years</td>
<td>17090 6535</td>
</tr>
</tbody>
</table>

Table (2) shows the distribution of risk factors and diseases showed that 50% of females had recurrent urinary tract infection, vaginitis and diabetes mellitus, 30% had hypertensive, Family history and anxiety. 20% had normal and overweight while 60% had obesity.

**Table 2: Distribution of risk factors and diseases**

<table>
<thead>
<tr>
<th>Risk factors and diseases</th>
<th>Groups</th>
<th>No.(total=260)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hypertension</td>
<td>Present/Absent</td>
<td>78182</td>
<td>30/70</td>
</tr>
<tr>
<td>2. Diabetes Miletus</td>
<td>Present/Absent</td>
<td>130130</td>
<td>50/50</td>
</tr>
<tr>
<td>3. Family history</td>
<td>Present/Absent</td>
<td>78182</td>
<td>30/70</td>
</tr>
<tr>
<td>5. Anxiety</td>
<td>Present/Absent</td>
<td>78182</td>
<td>30/70</td>
</tr>
<tr>
<td>6. Urinary tract infection</td>
<td>Present/Absent</td>
<td>130130</td>
<td>50/50</td>
</tr>
<tr>
<td>7. vaginitis</td>
<td>Present/Absent</td>
<td>130130</td>
<td>50/50</td>
</tr>
<tr>
<td>6. Bodymass index</td>
<td>Normal/overweight/obesity</td>
<td>5252156</td>
<td>20/20/60</td>
</tr>
</tbody>
</table>

Table (3) shows the distribution of clinical characteristics showed that 70% had infertility for more than 5 years and age of menarche ≥ 12 years, 20% had polycystic ovary and ovarian failure, 30% had D&C, cautery, IUI and 20% had IVF.

**Table 3: Distribution of clinical characteristics**

| 1. Infertility            | 1-5 years>5 years | 78182 | 30%70% |
| 2. Age of menarche        | <12 years≥ 12 years | 78182 | 30%80% |
| 5. Polycysticovarian syndrome | Present/Absent | 52208 | 20%80% |
Table (3) reveals the observed frequencies and percentage of the clinical characteristics for the studied infertile women including: duration of infertility, age at menarche, body mass index (BMI), polycystic ovarian disease.

Table (4) shows distribution of patients according to post coital test, for amount, 10% was 0ml (score 0), 30% was 1ml (score 1), 40% was 2ml (score 2), 20% was 3ml (score 3), for consistency, 60% was thick mucus (score 0), 20% was moderate and thin mucus (score 1, 2). For spinnbarkheit, 20% was <1 cm (score 0), 60% was 1-4 cm (score 1), 20% was 5-8 cm (score 2). For ferning test, 20% was 3-4 stem (score 3), 40% was atypical and non-crystals (score 0, 1). For cellularity 30% was > 11/HPF (score 0), 40% was 6-8/HPF (score 1), 30% was 1-5/HPF (score 2). For pH 77% was acidic with 100% dead sperms, 23% was alkaline with average of 40% active sperms, 30% moderate active, 20% non-forward and non-active respectively. For sperm motility, 70% was <10/HPF, 20% was 10-50/HPF and 10% was >50/HPF.
Table 5: Association between vaginal acidity and spermatozoa

<table>
<thead>
<tr>
<th>PH</th>
<th>Acidic</th>
<th>Alkaline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progressive rapid</td>
<td>Zero</td>
<td>30</td>
</tr>
<tr>
<td>Moderate prog. Liner motility</td>
<td>Zero</td>
<td>20</td>
</tr>
<tr>
<td>Non motile</td>
<td>196</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>196</td>
<td>64</td>
</tr>
</tbody>
</table>

$x^2 = 189.7$ highly significance

Table (6) shows the distribution sperm count after 2 hours of intercourse (3 days’ absence) showed that 40% had normal sperm, 30% had mild oligospermia, 20% had moderate oligospermia, 10%, had severe oligospermia.

Table 6: Distribution sperm count

<table>
<thead>
<tr>
<th>Sperm count</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;15 million</td>
<td>104</td>
<td>40%</td>
</tr>
<tr>
<td>10-15 million</td>
<td>78</td>
<td>30%</td>
</tr>
<tr>
<td>5-10 million</td>
<td>52</td>
<td>20%</td>
</tr>
<tr>
<td>&lt;5 million</td>
<td>26</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>260</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table (7) shows distribution of hormonal analysis showed that 20% increase of FSH (picture of ovarian failure) and Testosterone (poly ovarian syndrome) with average mean 15±2.5, 0.9±0.82 respectively. There was normal level of LH, TSH and prolactin with mean average 12±2.8, 0.7±0.42, 1.7±0.92, 17.4±4.4 respectively. 80% had decreased DHEA and D3 with mean average 90±5, 25±2 respectively.
Figure (1) shows the distribution of dietary pattern showed that 100% of female had dairy product, salt and tea with sugar daily, 60% had acidic food, fast food, dried food, gas drinking daily, 20% weekly and monthly, 20% had fruit with vegetables daily and weekly while 60% had vegetables monthly. About 50% of female smoking cigarette weekly.

**DISCUSSION**

The study revealed that less than half of infertile females were over 35 years. Infertility increases with aging. More than half of them were educated, from urban areas, housewives, this was agreeing with another study showed that the most of the females were housewives and from urban areas (81.18%) while was disagreeing with another study in Alexandria City showed that (42.4%) of them were workers, (31.4%)

<table>
<thead>
<tr>
<th>Hormones</th>
<th>Mean</th>
<th>SD</th>
<th>Average</th>
<th>No. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSH</td>
<td>15</td>
<td>2.5</td>
<td>Normal Increase</td>
<td>20852 80% 20%</td>
</tr>
<tr>
<td>LH</td>
<td>12</td>
<td>2.8</td>
<td>Normal</td>
<td>260 100%</td>
</tr>
<tr>
<td>Testosterone</td>
<td>0.9</td>
<td>0.82</td>
<td>Normal Increase</td>
<td>20852 80% 20%</td>
</tr>
<tr>
<td>TSH</td>
<td>1.7</td>
<td>0.92</td>
<td>Normal</td>
<td>260 100%</td>
</tr>
<tr>
<td>Prolactin</td>
<td>17.4</td>
<td>4.4</td>
<td>Normal</td>
<td>260 100%</td>
</tr>
<tr>
<td>DHEA</td>
<td>90</td>
<td>5</td>
<td>Normal Decrease</td>
<td>52208 20% 80%</td>
</tr>
<tr>
<td>D3</td>
<td>25</td>
<td>2</td>
<td>Normal Decrease</td>
<td>52208 20% 80%</td>
</tr>
</tbody>
</table>
from urban areas, this might be due to the variations in the community\(^{(29)}\). Half of females had recurrent urinary tract infection and vaginitis, the same picture was found in a study that showed that (50%), (56.82%) of females had vaginitis and UTI respectively with a tenfold risk of tubal infertility.\(^{(28)}\) The mean of BMI was 32.5±2.5, this was agreeing with other study showed that most of the females were overweight (40.91%) and obese (22.73%) \(^{(28)}\). Most of females had normal hormonal assay with small part of them had increased FSH and Testosterone levels in blood with gross deficiency in vitamin D3 and DHEA which was agreeing with results of a study showed that themost of females had normal hormonal assay (3.31% had abnormal assay) \(^{(30)}\). Studies found that when the level of D3 in the blood ≥30 ng/ml, there were good results in pregnancy, and through IVF, there were four times more likely to get pregnant than who had D3<30 ng/ml \(^{(31)}\). DHEA acts as a agonist to activate of the estrogen \(\beta\) receptors with a maximal response that greater than estradiol and even doubled. As such, it was proposed that it may be a major endogenous estrogen in the body \(^{(32,33)}\). Less than half of females had polycystic ovaries syndrome which was associated with insulin resistance and obesity \(^{(34)}\) also part of females had cautery and D&C which might lead to impairment of cervical mucus and block the canal \(^{(7)}\). There was poor post coital test that only small percentage was with normal amount and consistency (score 3) and high percentage had abnormal spinbarkheit, and ferning (score 0,1) PH of the vagina was acidic which leading to the defense mechanism of vagina with statistical significance \(^{(35)}\). Same results were conducted in a study showed that there was a significant difference between the high and low PH with respect to sperms motility \(^{(36)}\). 60% of husbands had low sperm count which is a common finding in infertility \(^{(37)}\). Most of females had dairy product, salt, acidic food, tea with sugar daily and more than half of them had gas drinking, fast and candid food daily, while intake of fruit and vegetables was monthly. Lifestyle factors as intake a lot of fast foods, fried and processed food with a lot of salt, sugars, dairy product, tobacco, and caffeine can throw off pH balance and affect reproduction. \(^{(38)}\)

**CONCLUSION**

High vaginal acidity, impairment of cervical mucus with deficiency in the level of DHEA and D3 in the female and oligospermia in the male should be considered in case of unexplained infertility.

**RECOMMENDATION**

Post-coital test should be done in case of female with unexplained infertility especially

**ETHICAL CLEARANCE**

The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**CONFLICT OF INTEREST**

The authors declare that they have no conflict of interest

**FUNDING:** Self-funding
REFERENCES


