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A Shot Study on Seminal Fluid Analysis of Iraqi Patients at 2017 & 2018

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Abstract: ***Within the male genital tract, various anatomical structures contribute to the formation of seminal fluid. These include the testes (testicles), epididymis, vas deferens, seminal vesicles, and prostate gland. The formation and maturation of spermatozoa, known as spermatogenesis and spermiogenesis, are rather intricate developmental process. In spermatogenesis, sperm cells undergo a series of changes, which result in the formation of mature motile spermatozoa. In addition, biochemical substances are secreted. These substances provide a nutrient environment for spermatozoa and as a means for transporting sperm cells. In performing semen analysis, various factors can impact the validity of the test results and can occur during the pre-analytic and analytic phases. To prevent erroneous results, it is imperative to have at a minimum: 1. Properly obtained semen sample. 2. Use of standardized test procedures. 3. Staff proficient in the interpretation of multiple semen analysis test parameters. The main objective of this educational activity is to provide the reader with an overview of semen analysis.***

Keywords: Semen analysis, male genital tract, spermatogenesis

1. Introduction

Semen analysis is a laboratory test that is primarily used for evaluating fertility potential and for assessing success following a vasectomy procedure. The composition of semen, also known as seminal fluid.

Semen analysis is a unique laboratory test in which multiple parameters are evaluated to determine the physical and chemical properties of a seminal fluid sample.

Semen analysis consists of macroscopic and microscopic examinations, which provide information on the physical, functional, and biochemical properties of seminal fluid.

Within the male genital tract, various anatomical structures contribute to the formation of seminal fluid. These include the testes (testicles), epididymis, vas deferens, seminal vesicles, and prostate gland. The formation and maturation of spermatozoa, known as spermatogenesis and spermiogenesis, are rather intricate developmental process.

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These substances provide a nutrient environment for spermatozoa and as a means for transporting sperm cells. In performing semen analysis, various factors can impact the validity of the test results and can occurduring the pre-analytic and analytic phases. To prevent erroneous results, it is imperative to have at aminimum:

1) Properly obtained semen sample.
2) Use of standardized test procedures.
3) Staff proficient in the interpretation of multiple semen analysis test parameters.

The main objective of this educational activity is to provide the reader with an overview of semen analysis. Semen analysis that are used in most laboratories. The readers are encouraged to review the listed references for further information. This includes the most recent edition of the World Health Organization (WHO) manual (4th edition, 2010), which is used as the main source of reference values of semen variables.

Tips of success in performing SFA

The following items should be included in patients' instructions for collection of semen samples:

- The semen sample should be collected after a period of sexual abstinence of at least 48 hours, but not more than 7 days.
- The patient produces a semen sample by masturbation and ejaculation into a wide mouthed container. The laboratory should ensure that the containers used are not toxic to sperm.1
- Lubricants and condoms should not be used in specimen procurement, since these can potentially affect the validity of the test results.
- It is important to obtain collection of a complete semen specimen. An incomplete specimen collection may not provide accurate results. Since sperm concentration is highest in the first portion of the ejaculate, an initial loss of specimen could result in a spurious decrease in sperm count.

2. Materials and Methods

Seminal fluid analysis were performed to 2148 patient in Kamal Al-Samarraee center for infertility and IVF January of 2017 and 2018 I(winter period) , also in July of the 2017 and 2018 (Summer period). Examinations were performed by manual methods by expert laboratory teams with at least

ten years in field .Cross sectional study design with SSPS analysis 23th version was used.

Analytical Phase

Semen analysis testing in the laboratory should commence within one hour of specimen procurement. The sample should be well mixed. The evaluated parameters of a semen analysis include macroscopic (visual) and microscopic examinations. The macroscopic evaluation includes: appearance, volume, liquefaction, viscosity, and pH. The microscopic examination includes sperm count, motility, and morphology. Other microscopic findings may be seen, such as sperm agglutination or the presence of other cells, (e.g. white blood cells). These findings and their potential clinical impact will be taken in consideration.

3. Results & Discussion

Statistical Analysis

Data analysis was done by utilizing SPSS for Windows, version 22 (SPSS Inc. Chicago, Illinois, United States). Data were expressed as mean ± standard error mean (SEM). Differences between groups were analyzed by student's t test. A two-tailed p-value less than 0.05 ($p<0.05$) was considered significant (Glover et al., 2008).

Glover, T.and Mitchell, K. (2008).An introduction to Biostatistics, 2nd ed. Waveland press .Inc.

Table 1: Comparison of seminal fluid analysis (SFA) parameters in July/2017 and July/2018

Parameter	July/2017 (n=289)	July/2018 (n=335)	P value
Volume ml	2.09±0.06	2.15±0.06	0.53
Liquefaction time / min	30.00±0.00	29.91±0.08	0.35
Count	23.78±1.04	17.48±0.80	0.00
Total count	50.52±2.69	38.49±2.15	0.00
Motility			
Grade A	4.93±0.55	3.74±0.44	0.09
Grade B	18.23±0.89	14.73±0.64	0.00
Grade C	17.40±0.61	17.38±0.58	0.98
Grade D	53.89±1.54	55.47±1.47	0.46
Morphology			
Normal	41.66±1.16	33.70±1.11	0.00
Abnormal	53.14±1.24	57.94±1.35	0.01
Pus cells	2.00±0.02	2.00±0.04	0.50

Table 2: Comparison of seminal fluid analysis (SFA) parameters in January/2017 and January/2018

Parameter	January/2017 (n=343)	January/2018 (n=378)	P value
volume ml	2.07±0.04	2.38±0.06	0.00
Liquefaction time/ min	30.00±0.00	29.76±0.13	0.08
Count	23.10±0.99	15.48±0.66	0.00
Total count	49.65±2.58	38.11±2.66	0.00
Motility			
Grade A	3.62±0.42	1.75±0.28	0.00
Grade B	14.62±0.67	14.43±0.62	0.83
Grade C	17.79±0.56	19.24±0.56	0.07
Grade D	56.07±1.40	55.90±1.32	0.92
Morphology			
Normal	39.65±1.07	34.87±1.05	0.00
Abnormal	52.76±1.20	56.81±1.25	0.02
Pus cells	2.00±0.02	2.00±0.05	0.53

Table 3: Comparison of seminal fluid analysis (SFA) parameters in January and July 2017

Parameter	January/2017 (n=343)	July/2017 (n=289)	P value
volume ml	2.07±0.04	2.09±0.06	0.80
Liquefaction time/min	30.00±0.00	30.00±0.00	__
Count	23.10±0.99	23.78±1.04	0.63
Total count	49.65±2.58	50.52±2.69	0.81
Motility			
Grade A	3.62±0.42	4.93±0.55	0.06
Grade B	14.62±0.67	18.23±0.89	0.00
Grade C	17.79±0.56	17.40±0.61	0.63
Grade D	56.07±1.40	53.89±1.54	0.29
Morphology			
Normal	39.65±1.07	41.66±1.16	0.20
Abnormal	52.76±1.20	53.14±1.24	0.82
Pus cells	2.00±0.02	2.00±0.05	0.57

Table 4: Comparison of seminal fluid analysis (SFA) parameters in January and July 2018

Parameter	January/2018 (n=378)	July/2018 (n=335)	*P* value
Volume ml	2.38±0.06	2.15±0.06	0.01
liquefaction time / min	29.76±0.13	29.91±0.08	0.37
Count	15.48±0.66	17.48±0.80	0.05
Total count	38.11±2.66	38.49±2.15	0.91
Motility			
Grade A	1.75±0.28	3.74±0.44	0.00
Grade B	14.43±0.62	14.73±0.64	0.76
Grade C	19.24±0.56	17.38±0.58	0.02
Grade D	55.90±1.32	55.47±1.47	0.82
Morphology			
Normal	34.87±1.05	33.70±1.11	0.44
Abnormal	56.81±1.25	57.94±1.35	0.54
Pus cells	2.00±0.05	2.00±0.04	0.51

According to the WHO guidelines, minimum sperm values are 2 ml (volume), 20 million/ml (concentration), 50% (motility) and 30% (normal morphology). However, there is no exact threshold under which sperm values can be considered abnormal. Some authors claim that fertility decreases only with a sperm concentration of 5 million/ml or less (Jouannet, Ann BiolClin 45:335; 1987). Using the 10th percentile Ombelet (Hum Rep 12:987, 1997) has found a cut-off value of 14 million/ml for sperm concentration, 28% for progressive motility, 8 million for total motile sperm count and 5% for sperm morphology using the strict criteria of Kruger. Normal values for sperm morphology depend on the classification method (Chia, Hum Rep 13:3394, 1998). There is a large fluctuation of sperm values depending on the duration of abstinence, the conditions of sperm collection and the season and possibly also the time of the day (Cagnacci, Hum Rep 14:106,1999. Concerning our data a significant depressing in the sperm count with time (one year apart)

And this is a discouraging result with dangerous outcome, many environmental cause could be speculated and summarized below:

Environmental factors (8)

- Sauna, hot baths, tight underwear
- Feverish states
- Toxic products: lead, cadmium

- Aromatic solvents
- Drugs: heroine, methadone: FSH and LH.
- Alcohol: inhibition of T synthesis and sperm capacitation.
- Reduced sperm quality in heavy drinkers.
- Cigarette smoking: many studies the sperm density is 22% lower in smokers.

But the way of usage and carrying the smart phone near the genitalia still under focusing of many andrologist and this needs an extensive studies to narrow the long list.

Mild reduction in the movement of grade A and B between the summer and winter of both years 2017 and 2018 with count preservation and this could be due to the local increase in the temperature especially in Iraq some time it may reach up to 50C in July (9).

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