Med. J. Cairo Univ., Vol. 93, No. 2, Accepted 18/5/2025
DOI: 10.22608/MJCU. 851-858, June 2025
www.medicaljournalofcairouniversity.net

Assessment of Risk Factors of Ovarian Hyperstimulation Syndrome after Assisted Reproduction

MAHMOUD E. ARAFA, M.Sc.; YASSER MESBAH, M.D.; MAHER ELESAWY, M.D.; ABDALLAH GEITH, M.D. and ALHUSSEIN A. MOHAMED, M.D.

The Department of Obstetrics & Gynecology, Faculty of Medicine, Mansoura University

Abstract

Background: Ovarian hyperstimulation syndrome (OHSS) is a life-threatening complication occurring in stimulated ovarian cycles. It is commonly observed in women undergoing controlled ovarian hyperstimulation. (COH) employed during assisted reproductive technology (ART).

Aim of Study: Therefore, this study was conducted to explore the risk factors associated with development of OHSS in the patients undergoing ART.

Patients and Methods: The study enrolled 113 infertile cases underwent IVF/ICSI. OHSS occurrence was detected and possible risk factors for OHSS were studied.

Results: The mean age of OHSS patients was 26.5±4.55 compared 28.52±5.60 in Non OHSS patients, the mean BMI in OHSS patientswas 24.22±5.08 compared to 28.62±5.03 in non OHSS patients. Only 5.6% of those who developed OHSS had history of OHSS before. OHSS patients subject had higherincidence of PCOS (83.3% vs. 30.5%) in Non OHSS patients. The antagonist protocol with a GnRH agonist trigger had the lowest incidence of OHSS (2.2%, moderate only) with zero incidence of severe or lethal grades, while the long agonist protocol with an hCG trigger had the highest (26%, including both moderate and severe grades). The mean basal AFC was much higher in OHSS patients (22.61±4.20) compared to non OHSS patients (14.02±4.87). Basal AMH was also much higher in OHSS patients compared to non OHSS patients (5.66±0.91 vs. 3.46±2.56). OHSS patients received much higher doses of both FSH&LH (FSH=300±48.50 vs 270.52±73.02) (LH=150±0 vs. 110.03±38.09). OHSS patients had much higher retrieved eggs (median 21) compared to non OHSS patients (median 10).

Conclusions: Undergoing ART programs to restore fertility is becoming increasingly widespread, leading to ever-higher numbers of cases being admitted to emergency departments with complications. OHSS is one of the most frequent complications Risk factors for OHSS should be considered for any patient seeking for ART.

Low threshold for detection of OHSS and application of properpreventive measures should be done. ICU admission should be considered for cases of severe OHSS rather than outpatient for mild cases.

Key Words: *Ovarian hyperstimulation syndrome (OHSS) – Controlled ovarian hyperstimulation (COH) – Body Mass Index (BMI) – Anti-mullerian hormone (AMH) – Antral follicle count (AFC) – Poly cystic ovarian syndrome (PCOS) – Progesterone primed ovarian stimulation (PPOS).*

Introduction

OVARIAN hyperstimulation syndrome (OHSS) is a life-threatening complication happening in stimulated ovarian cycles. It is commonly noticed in females undergoing COH employed during assisted reproductive technology (ART). It is characterized by a significant increase in vascular permeability, ovarian enlargement and hemoconcentration with increased blood viscosity and leakage of fluid into the extra vascular space **[1].**

Numerous possible mediators, such as vascular endothelial growth factor (VEGF), renin-angiotensin system and other cytokines, couldbe comprised in the development of this complication. In addition, patient with severe OHSS may develop ascites, pleural & pericardial effusion, thromboembolism & multiorgan failure **[2].**

Multiple factors accompanied by OHSS have been identified comprisingyoung age, low BMI, polycystic ovary syndrome (PCOS), high anti Mullerian hormone levels (AMH), high antral follicle-count (AFC), high gonadotrophin (Gn) dosage, previous OHSS, highserum estradiol (E2) levels, a high

Correspondence to: Dr. Mahmoud E. Arafa,
The Department of Obstetrics & Gynecology,
Faculty of Medicine, Mansoura University

number of follicles or collected eggs, luteal support with human chorionic gonadotrophin (hCG) and pregnancy.

Patients can present with lower abdominal pain, mild distension, nausea, vomiting or diarrhea in mild cases. With progression of disease, fluid accumulation in the peritoneal cavity causes further distension and ultimately tense ascites associated with increasing tachypnea and diminished urine output. Weight gain can be rapid of more than 1kg/day. Ultrasound examination displays enlarged ovaries and presence of ascites. Blood tests demonstrate hemoconcentration, leukocytosis, alteration in liver enzymes, electrolyte imbalance and in extreme cases increased creatinine levels.

Therefore, this study was conducted to explore the risk factors associated with development of OHSS in the patients undergoing ART **[3]**.

Patients and Methods

This was case control study conducted on infertile women at department of Obstetrics and Gynecology, Mansoura University Hospitals since February 2022 and February 2025 after obtaining the approval from Institutional Research Board (IRB).

Entire cases were divided into two subgroups according to development of OHSS after COH:

- Group A: Cases with OHSS.
- Group B: Cases with non OHSS.

Inclusion criteria:

- Female patients 20 to 40 years of age with Primary or secondary infertile patients.

Exclusion criteria:

- Gynaecological tumors (ovarian tumour - endometrial tumour and cervical cancer).
- Chromosomal aberrations.
- Extensive systemic diseases as liver, kidney or cardiovascular diseases Data were collected from History taking, General, Abdominal, Local examination, Laboratory investigations and Ultrasound imaging.

Entire cases were subjected to the following:

- History taking: Which include age, menstrual history, special habits, past history of medical disorders, ICU admission & surgical history.
- Physical examination: Which included general, abdominal and local examination as well as transvaginal ultrasonography (TVS).
- The patients' demographics, including age, BMI were collected. During the therapy, the Gn dose, type of Gn and AMH on the day of Gn treatment initiation were recorded. E2 level on the day of hCG were recorded as well. The number of oocytes on the day of oocyte retrieval were obtained. The basal AFC will be measured using TVS between the 2^{nd} and 3^{rd} day of the menstrual cycle, and antral follicles with a diameter of 2–10mm were counted. The type of controlled ovarian stimulation protocol, type of trigger & type of embryo transfer were recorded.

Statistical analysis:

The collected data were coded, processed and analyzed using SPSS program (Version 26) for windows. The appropriate statistical tests will be used when needed. *p*-values less than 0.05 (5%) were considered to be statically significant.

Ethical consideration:

- The research approval of the study was obtained from IRB of Faculty of Medicine at Mansoura University before starting the study.
- The researcher had clarified the objective and aim of the study to the subjects included in the study.
- The researcher had assured maintaining anonymity and confidentiality of subject's data.
- Subjects were informed that they allowed to choose to participate or not in the study and that, they have the right to withdraw from the study at any time without giving any reasons.
- Ethics, values, culture and beliefs of subjects were respected.

Results

The study enrolled 113 infertile cases underwent IVF/ICSI. We divided the study subjects into two groups according to the development of ovarian hyper stimulation syndrome (OHSS) after controlled ovarian stimulation (COH). Group A included cases that developed OHSS after COH, while Group B included cases that did not develop OHSS after COH. Group B included 95 patients while Group A included 18 patients.

The mean age of those in Group A was 26.3±3.99 compared to 29.36±5.95 in Group B. The mean BMI in Group A was 24.65±4.13 compared to 29.93±4.88 in Group B. Only .9% of those who developed OHSS had history of OHSS before. Group A subjects had higher incidence of PCOS (80.3% vs. 30.5% in group B).

Mean basal AFC was much higher in group A (21.02±3.57) compared to group B (11.93±3.63). basal AMH was also much higher in group A compared to group B (6.18±1.27 vs. 1.98±1.16). Group A received much higher doses of both FSH&LH (FSH=300±54.28 vs 264.29±77.62) (LH=138.46 ±28.17 vs. 102.32±36.99). Group A had much higher retrieved eggs (median 18) compared to those in group B (median 7).

Table (1): Descriptive statistics of all studied cases.

	Total number
	Mean ±SD (Min-max)
Age / years	28.19±5.48
BMI (kg/m^2)	27.92±5.27
AFC	15.39±5.71
AMH	3.98±2.45
FSH dose per/day	277.87±71.55 (150-450)
LH dose per/day	115.74±37.93 (75-151)
Number of egg retrieval	12.77±8.37 12 (1-53)
	N %
PCOS:	
No	69 61.1
Yes	44 38.9
Types of gonadotrophins:	
FSH alone	77 68.1
FSH+LH	36 31.9
COH protocol:	
Long agonist	34 30.1
Antagonist	79 69.9
Prior history of OHSS:	
–ve	112 99.1
+ve	1 0.9
Trigger:	
HCG10000	65 57.5
Decapetityl	45 39.8
Decapetityl+HCG5000	3 2.7
OHSS:	
No	95 84.1
Yes	18 15.9
OHSS Grade:	
Moderate	10 55.6
Severe	6 33.3
Critical OHSS	2 11.1
ICU admission in OHSS cases:	
No	0 0
Yes	18 100

Table (2): Comparison of demographic characteristics and prior history of OHSS between cases with and without ovarian hyperstimulation syndrome.

	OHSS		Test of significance	*p*-value
	No (N=95)	Yes (N=18)		
	Mean ± SD	Mean ± SD		
Age / years:				
Mean ± SD	28.52±5.60	26.50±4.55	*t*=1.44	*p*=0.153
BMI (kg/m^2):				
Mean ± SD	28.62±5.03	24.22±5.08	*t*=3.39	*p*<0.001*
Prior history of OHSS:	N (%)	N (%)	FET=5.33	*p*=0.159
–ve	95 (100)	17 (94.4)		
+ve	0	1 (5.6)		

t:Student *t*-test. FET: Fisher exact test. *Statistically significant.

Table (3): Comparison of AFC, AMH, FSH dose and LH dose between cases with and without ovarian hyperstimulation syndrome.

	OHSS		Test of significance	*p*-value
	No (N=95)	Yes (N=18)		
	Mean ± SD	Mean ± SD		
AFC	14.02±4.87	22.61±4.20	*t*=6.99	*p*=0.001*
AMH	3.46±2.56	5.66±0.91	*t*=1.86	*p*=0.079
FSH dose (per/day)	270.52±73.02	300±48.50	*t*=2.57	0.01*
LH dose (per/day)	110.03±38.09	150±0	*t*=2.32	0.027*

t:Student *t*-test. *Statistically significant.

Table (4): Comparison of PCOS between case with and without OHSS.

	OHSS		Test of significance	*p*-value
	No (N=95)	Yes (N=18)		
	Mean ± SD	Mean ± SD		
PCOS:				
No	66 (69.5)	3 (16.7)	$\chi2$=17.75	*p*<0.001*
Yes	29 (30.5)	15 (83.3)		

$\chi2$ = Chi-Square test. *Statistically significant.

Table (5): Comparison of COH protocol and Types of gonadotrophins between case with and without OHSS.

	OHSS		Test of significance	*p*-value
	No (N=95) (%)	Yes (N=18) (%)		
Types of gonadotrophins:				
FSH	64 (67.4)	13 (72.2)	$\chi2$=0.164	*p*=0.685
FSH+LH	31 (32.6)	5 (27.8)		
COH protocol:				
Long agonist	25 (26.3)	9 (50)	$\chi2$=8.19	*p*=0.016*
Antagonist	70 (73.7)	9 (50)		

$\chi2$ = Chi-Square test. *Statistically significant.

Table (6): Incidence of OHSS among different IVF/ICSI protocols according to both pituitary suppression protocols & oocyte maturation trigger.

OHSS	(Ant.+Agonist trigger) (N=45)	(Ant.+HCG) (N=34)	(Long agonist+CGG) (N=34)	p_1	p_2	p_3
No	44 (97.8%)	26 (77.5%)	25 (73.5%)	0.003*	0.002*	0.945
Yes	1 (2.2%)	8 (23.5%)	9 (26.5%)			
Freeze all N (%)	45 (100%)	9 (26.5%)	3 (8.8%)	0.001*	0.001*	0.024*
Fresh embryo transfer N (%)	0	25 (73.5%)	31 (91.2%)			

p1: Difference between Ant.+Agonist trigger VERSUS Ant.+HCG.
p2: Difference between Ant.+Agonist trigger VERSUS Long agonist+HCGG.
p3: Difference between Ant.+HCG versus Long agonist+HCGG.

Table (7): Comparison of Trigger between case with and without OHSS.

	OHSS		Test of significance	*p*-value
	No (N=95) (%)	Yes (N=18) (%)		
Trigger:				
HCG10000	48 (50.5)	17 (94.4)	χ2MC=11.96	*p*=0.002*
Agonist trigger	44 (46.3)	1 (5.6)		
Dual trigger	3 (3.2)	0		

χ2 = Chi-Square test. MC: Monte Carlo test.

Table (8): Comparison of number of egg retrieval between case with and without OHSS.

	OHSS		Test of significance	*p*-value
	No (N=95) (%)	Yes (N=18) (%)		
Number of egg retrieval:				
Median (min-max)	10 (1-32)	21 (14-53)	Z=5.78	*p*<0.001*

Z: Mann Whitney U test.

Table (9): Relation between OHSS severity and demographic, clinical and laboratory findings among studied cases.

	Grade		Test of significance	*p*-value
	Moderate N=10 (%)	Severe or critical N=8 (%)		
Age / years	27.30±4.62	25.50±4.57	*t*=0.826	0.421
AFC	23.3±4.11	21.75±4.43	*t*=0.768	0.454
AMH	5.65±1.62	5.67±0.577	*t*=0.017	0.987
BMI (kg/m^2)	23±3.26	25.75±6.64	*t*=1.15	0.266
FSH dose	300±47.43	318.75±53.03	*t*=0.158	0.876
LH dose	150±0	150±0.0	*t*=0.158	0.876
PCOS:				
No	2 (20)	1 (12.5)	χ2=0.180	0.671
Yes	8 (80)	7 (87.5)	χ2=0.055	0.814
Types of gonadotrophins:				
FSH	7 (70)	6 (75)	χ2=1.8	0.407
FSH+LH	3 (30)	2 (25)		
COH protocol:				
Long agonist	4 (40%)	5 (62.5%)	χ2=0.847	0.358
Antagonist	6 (60%)	3 (37.5%)		
Prior history of OHSS:				
–ve	9 (90%)	8 (100%)	χ2=0.847	0.358
+ve	1 (10%)	0		
Trigger:				
HCG10000	9 (90%)	8 (100%)	Z=2.96	*p*=0.003*
Agonist trig	1 (10%)	0		
Number of egg retrieval	15 (4-30)	20 (14-53)		
ICU admission:				
No	0	0	–	1.0
Yes	10 (100)	8 (100)		

t: Student *t*-test. Z : Mann Whitney U test.
*Statistically significant. FET: Fisher exact test.
χ2 : Chi-Square test.

Discussion

The study enrolled 113 infertile cases underwent IVF/ICSI. OHSS occurrence was detected and possible risk factors for OHSS were studied.

We divided the study subjects into two groups according to the development of ovarian hyper stimulation syndrome (OHSS) after controlled ovarian stimulation (COH). Group A included cases that developed OHSS after COH, while Group B included cases that did not develop OHSS after COH. Regarding the demographic data of the subjects, Group B included 95 patients (84.1% of the study sample) while Group A included 18 patients (15.9% of the study sample).The antagonist protocol with a GnRH agonist trigger had the lowest incidence of OHSS (2.2%, moderate only) with zero incidence of severe or lethal grades, while the long agonist protocol with an hCG trigger had the highest (26%, including both moderate and severe grades). There was a significant difference between the group following the Antagonist protocol with a GnRH Agonist trigger and the group following the Long Agonist protocol with an hCG trigger. Also, the group following the Antagonist protocol with a GnRH Agonist trigger and the group following the Antagonist protocol with an hCG trigger showed significant differences, despite having the same pituitary suppression protocol (antagonist). The highest incidence was in the group triggered by hCG. There was no significant disparity between the group following the Antagonist protocol with an hCG trigger and the group following the Long Agonist protocol with an hCG trigger despite the difference in pituitary suppression protocol (antagonist vs long agonist), but both were triggered by hCG. This suggests that Antagonist protocol is a powerful preventive measure against OHSS in patients if oocyte maturation is triggered by GnRH agonist, freeze all is practiced, and hCG is avoided. These findings align with the findings of [4].

The GnRH antagonist protocol is emerging as the favored approach for high risk cases due to its potential to reduce risk of OHSS, its financial viability, and its shorter duration of stimulation, all without negatively affecting the like-hood of pregnancy outcome.

The present study supports this, demonstrating a lower incidence of OHSS with the antagonist protocol, especially when oocyte maturation was achieved by GnRH agonist instead of hCG. This aligns with [5].

The GnRH antagonist protocol is advised for patients with high like-hood of OHSS, and substituting hCG with a GnRH agonist can further decrease the risk of severe OHSS. This finding aligns with the results of [6].

The current study found that using hCG as an oocyte maturation trigger increased the likelihood of OHSS in patients undergoing IVF/ICSI. This finding aligns with the findings of [7].

Freezing all embryos appeared to be a valuable tool to lower the risk of OHSS in cases undergoing IVF/ICSI. Our investigation demonstrated a significant correlation between the choice of oocyte maturation trigger (hCG versus GnRH agonist) and the preferred embryo transfer strategy within the antagonist protocol. Notably, patients triggered with the GnRH agonist exclusively underwent a freeze-all approach, while those triggered with hCG demonstrated a greater preference towards fresh embryo transfer. Studies have shown that compared to fresh embryo transfer, the freeze-all approach significantly reduces the risk of OHSS development while maintaining elevated rates of live births in following frozen embryo transfer cycles. This benefit is particularly important for patients at high risk of OHSS, and the freeze-all strategy can be safely carried out using GnRH agonist trigger [8].

Freeze-all approach might even improve pregnancy rates beyond just reducing OHSS risk. Therefore, considering a freeze-all technique, especially when fresh embryo transfer carries a high OHSS risk, presents a valuable alternative [9].

The mean age of those in Group A was 26.5±4.55 compared to 28.52±5.60 in Group B.

This was statistically significant and shows that higher maternal age was accompanied by less probability for OHSS. This finding is consistent with the findings of who found that The mean age of the cases in the OHSS groups was two years younger than in the non-OHSS group with a significant difference (p=0.015).

As to the BMI, higher BMI was also associated with less probability for OHSS, where the mean BMI in Group A was 24.22±5.08 compared to 28.62±5.03 in Group B. However, [3] found No statistical difference in BMI between both groups.

Considering the presence of prior medical history of OHSS, only 5.6% of those who developed OHSS (Group A) had history of OHSS before, while none of those who didn't develop OHSS (Group B) had any prior history of OHSS. This percentage, although small and not statistically significant, carries the possibility of an association between the presence of a prior history of OHSS and the possibility of developing OHSS in the future.

Studies indicate that women who have formerly experienced OHSS are at a higher risk of developing it again in future cycles, especially if similar stimulation protocols are used [10].

In the sense of the presence of PCOS, Group A subjects had higher incidence of PCOS (83.3% vs. 30.5% in group B). It is consistent with the findings of *[11]*. Women with PCO are at higher risk for OHSS, especially when undergoing fertility treatments like IVF *[12]*.

As to the hormonal profile and ovarian reserve parameters, the mean basal AFC was much higher in group A (22.61±4.20) compared to group B (14.02±4.87). In addition, basal AMH was also much higher in group A compared to group B (5.66±0.91 vs. 3.46±2.56). Both these parameters were statistically significant and correlate with the pathophysiology underlying OHSS.

This aligns with the findings of(3)who found a significant difference in the basal AFC between the cases in the OHSS and non-OHSS groups (24.82±8.11 vs 16.30±8.86, $p<0.001$).

Several factors accompanied by OHSS have been identified, such as:

Young age, Low BMI, PCOS, High AMH levels, A high AFC, High Gn dosage, Previous OHSS, A high number of follicles or collected eggs *[3]*.

As to FSH and LH doses, group A received much higher doses of both hormones, which can explain OHSS as well as being statistically significant (FSH=300±48.50 vs 270.52±73.02) (LH=150±0 vs. 110.03±38.09). The administration of high doses of FSH and LH is accompanied by an increased risk of developing OHSS *[13,14]*.

On analyzing the aspect of the number of egg retrieval, we found that those in group A had much higher retrieved eggs (median 21) compared to those in group B (median 10). This statistically significant data shows that OHSS yields a greater number of eggs and thus a higher probability of ART success and it is consistent with the findings of *[3,15]*.

OHSS carries a higher risk on patient health, where 100% (18 patients) of group A patients needed ICU admission. On the other hand, none of those of group B needed that. The incidence of ICU admission due to severe OHSS is relatively low but can occur in severe cases, particularly in high-risk individuals. Studies report that ICU admission occurs in around 1% of severe OHSS cases, but the exact incidence can vary depending on the population studied and the treatment protocols used *[13]*.

On analyzing those who developed OHSS after COH (Group A), we found that of those who received only FSH (77 subjects), 13 of them developed OHSS (16.9%). On the other hand, those who received both FSH+LH (36 subjects), only 5 subjects (13.9%) developed OHSS. This finding was statistically significant and shows that the incidence of OHSS is higher in those who receive FSH alone.

Our findings align with those of other studies, where they found that the type of gonadotropin used during ovarian stimulation may influence the incidence of OHSS *[15]*. Studies indicate that using FSH alone can lead to a higher risk of OHSS compared with combinations of FSH and LH in certain populations. This is because FSH is the primary driver of follicular growth, and without the moderating effect of LH, excessive follicular development can occur *[16]*.

Conclusions:

Undergoing ART programs to restore fertility is becoming increasingly widespread, leading to ever-higher numbers of cases being admitted to emergency departments with complications. OHSS has been considereda commonadverse event.

Young age, Low BMI, PCOS, High AMH levels, A high AFC, High Gn dosage, Previous OHSS, A high number of follicles or collected eggs are certain factors that could predispose females to OHSS.

Together with OHSS, cases may also develop complications such as infections, thromboembolism, acute respiratory distress syndrome, acute coronary syndrome, and shock.

Risk factors for OHSS should be considered for any patient seeking for ART.

Low threshold for detection of OHSS and application of proper preventive measures should be done.

To decrease risk of OHS, certain measures can be taken, including the use of antagonist protocol or GnRH agonist trigger for ovulation, as well as cryopreservation of all embryos.

Conflict of interest: Nil.

Fund: Nil.

References

1- NASTRI C., TEIXEIRA D., MORONI R., et al.: Ovarian hyperstimulation syndrome: Pathophysiology, staging, prediction and prevention. Ultrasound Obstet. Gynecol., 45 (4): 377-393, 2015.

2- PELLICER N. and PELLICER A.: Pathogenesis and management in OHSS. In: Handbook of Current and Novel Protocols for the Treatment of Infertility. Academic Press, p. 197-209, 2024.

3- MA T., NIU Y., WEI B., et al.: Moderate-to-severe ovarian hyperstimulation syndrome: A retrospective multivariate logistic regression analysis in Chinese patients. Adv. Clin. Exp. Med., 29 (1): 85-90, 2020.

4- PALOMBA S., COSTANZI F., NELSON S.M., CASERTA D. and HUMAIDAN P.: Interventions to prevent or reduce

the incidence and severity of ovarian hyperstimulation syndrome: A systematic umbrella review of the best clinical evidence. Reprod Biol. Endocrinol., 21 (1): 67, 2023.

5- HE Y., TANG Y., CHEN S., LIU J. and LIU H.: Effect of GnRH agonist alone or combined with different low-dose hCG on cumulative live birth rate for high responders in GnRH antagonist cycles: A retrospective study. BMC Pregnancy Child birth, 22 (1): 172, 2022.

6- SHEN X., YANG Q., LI L. and LU W.: [Retracted] Clinical pregnancy and incidence of ovarian hyperstimulation syndrome in high ovarian responders receiving different doses of hCG supplementation in a GnRH-agonist trigger protocol. Evid Based Complement Alternat Med., 2021 (1): 2180933, 2021.

7- ZHANG Y., GUO X., GUO L., CHANG H.M., SHU J. and LEUNG P.C.: Outcome's comparison of IVF/ICSI among different trigger methods for final oocyte maturation: A systematic review and meta-analysis. FASEB J., 35 (7): e21696, 2021.

8- CASTILLO J.C., HAAHR T., MARTÍNEZ-MOYA M. and HUMAIDAN P.: Gonadotropin-releasing hormone agonist for ovulation trigger–OHSS prevention and use of modified luteal phase support for fresh embryo transfer. Ups J. Med. Sci., 125 (2): 131-137, 2020.

9- BORGES Jr. E., BRAGA D.P., SETTI A.S., VINGRIS L.S., FIGUEIRA R.C. and IACONELLI Jr. A.: Strategies for the management of OHSS: Results from freezing-all cycles. JBRA Assist Reprod, 20 (1): 8-12, 2016.

10- ABOULGHAR M.A. and MANSOUR R.T.: Ovarian hyperstimulation syndrome: Classifications and critical analysis of preventive measures. Hum. Reprod Update, 2003.

11- DAOLIO J., SPERDUTI S., CASARINI L., et al.: Spontaneous and iatrogenic ovarian hyperstimulation syndrome in the absence of FSHR mutations: A case report of two unexpected cases. BMC Med. Genomics, 16 (1), 2023.

12- Royal College of Obstetricians & Gynaecologists. Ovarian hyperstimulation syndrome (OHSS) patient information leaflet [Internet]. 2016 [cited 2024 Oct 22]. Available from: https://www.rcog.org.uk/for-the-public/browse-our-patient-information/ovarian-hyperstimulation-syndrome.

13- NAVOT D., BERGH P.A. and LAUFER N.: Ovarian hyperstimulation syndrome in novel reproductive technologies: Prevention and treatment. Fertil Steril, 112 (4): e209-e221, 2019.

14- FIEDLER K. and EZCURRA D.: Predicting and preventing ovarian hyperstimulation syndrome (OHSS): The need for individualized not standardized treatment. Reprod Biol. Endocrinol., 10: 21, 2012.

15- PAKHOMOV S.P., ORLOVA V.S., VERZILINA I.N., SUKHIH N.V., NAGORNIY A.V. and MATROSOVA A.V.: Risk Factors and Methods for Predicting Ovarian Hyperstimulation Syndrome (OHSS) in the in vitro Fertilization. Arch. Razi Inst., 76 (5): 1461-1468, 2021.

16- MORO F., SCARINCI E., PALLA C., et al.: Highly purified hMG versus recombinant FSH plus recombinant LH in intrauterine insemination cycles in women ≥35 years: A RCT. Hum. Reprod., 30 (1): 179-185, 2015.

تقييم عوامل الخطر لمتلازمة فرط اثارة المبايض بعد الاخصاب المساعد فى مستشفيات جامعة المنصورة

تعد متلازمة فرط تنشيط المبايض من المضاعفات التى تهدد الحياة والتى تحدث فى دورات المبيض المحفزة. يتم ملاحظة ذلك بشكل شائع عند النساء اللواتى يخضعن لفرط تنشيط المبيض المستخدم أثناء تقنية الإنجاب المساعد.

تم تحديد العديد من العوامل المرتبطة بمتلازمة فرط تنشيط المبايض بما فى ذلك صغر السن، وإنخفاض مؤشر كتلة الجسم، ومتلازمة تكيس المبيض، ومستويات هرمون مضاد مولر، وارتفاع عدد البصيلات الغارية وتاريخ مرضى بمتلازمة فرط تنشيط المبايض، مستويات عالية من استراديول، عدد كبير من البصيلات أو البويضات المجمعة أثناء الاخصاب المساعد والحمل فى حد ذاته.

الهدف من الدراسة: تهدف الدراسة إلى إستكشاف عوامل الخطر المرتبطة بتطور متلازمة فرط تنشيط المبايض فى المرضى الذين يخضعون لتكنولوجيا الإنجاب المساعد.

النتائج الرئيسية:

١- نسبة حدوث متلازمة فرط تنبيه المبيض: من بين ١١٣ حالة، لم تظهر أعراض المتلازمة لدى ٩٥ حالة (٨٤,١٪ من العينة)، بينما ظهرت المتلازمة لدى ١٨ حالة (١٥,٩٪).

٢- العمر ومؤشر كتلة الجسم : (كان العمر المتوسط للنساء اللآتى أصبن بمتلازمة فرط تنبيه المبيض هو ٢٦,٥٠ ± ٤,٥٥، مقارنة بـ ٢٨,٥٢ ± ٥,٦٠ لدى النساء اللآتى لم يصبن بها. كذلك ارتبط العمر الأكبر وارتفاع مؤشر كتلة الجسم بإنخفاض احتمالية الإصابة بالمتلازمة، حيث كان متوسط مؤشر كتلة الجسم للنساء المصابات ٢٤,٢٢ ± ٥,٠٨ مقارنة بـ ٢٨,٦٢ ± ٥,٠٣ للنساء غير المصابات.

٣- متلازمة تكيس المبايض : كانت النساء اللواتى يعانين من متلازمة تكيس المبايض أكثر عرضة للإصابة بمتلازمة فرط تنشيط المبايض، خاصة عند الخضوع لعلاجات الخصوبة مثل التلقيح الصناعى.