

Table 1. Characteristics of included studies – Predisponerende factoren van OHSS

Author (year)	Population	Outcome	Predisposing factors	Model characteristics
Aghssa, 2015	Long GnRH agonist Controlled Ovarian Hyperstimulation (n=105)	OHSS	- The number of retrieved oocytes: OR=1.3 (95%CI 1.1 to 1.6) - Basal AMH value: OR=5.4 (95%CI 1.1 to 27.9) - Follicle count: OR=1.5 (95%CI 1.1 to 1.9) Corrected for: not reported	<u>AMH-level</u> AUC: 0.86 (95%CI 0.78 to 0.95) Cut-off value 6.95 ng/l (sensitivity=75%, specificity=84%, PLR=4.7, NLR=0.3)
Aramwit, 2008	Women (n=117) undergoing ovarian stimulation for in vitro fertilization or intracytoplasmic sperm injection with recombinant follicle-stimulating hormone either follitropin- β or follitropin- α	Moderate to severe OHSS	- Serum E2 peak concentration of ≥ 4500 pg/mL: OR=1.15 (95%CI 1.02 to 1.29) - Total number of oocytes retrieved of ≥ 15: OR=1.74 (95%CI 1.18 to 2.58) Corrected for: not reported	Sensitivity=75.0% Specificity: 100.0% PPV: 100.0% NPV: 97.2%.
Ashrafi, 2015	86 NPCOS* patients with moderate-to-severe OHSS and 172 NPCOS patients without OHSS who underwent in vitro fertilization and/or intracytoplasmic sperm injection	Moderate to severe OHSS	- Age: OR=0.9 (95%CI 0.81 to 0.99) - Antral follicles count: OR=4.3 (95%CI 2.7 to 6.9) Corrected for: not reported	Regression model based on primary demographic, medical history, and clinical characteristics: AUC: 0.94 (95%CI 0.91 to 0.97) Sensitivity: 88.1% (95%CI 79.2 to 94.1) Specificity: 87.9% (95%CI 81.6 to 92.7) Serum E ₂ level on HCG day: AUC: 0.95 (95%CI 0.92 to 0.98) Cut-off value: 2045

				Sensitivity: 96.5% (95%CI 90.1 to 99.3) Specificity: 83.7% (95%CI 77.0 to 89.2) Total number of follicles ≥ 12 mm on HCG day: AUC: 0.94 (95%CI 0.90 to 0.96) Cut-off value: 17 Sensitivity: 81.4% (95%CI 71.6 to 89.0) Specificity: 98 (95%CI 94.4 to 99.6)
Griesinger, 2016	Patients undergoing ovarian stimulation on day 2 or 3 of their menstrual cycle with corifollitropin alfa treatment (n=2344)	Moderate to severe OHSS	<u>Moderate to severe OHSS:</u> - Number of follicles ≥ 11 mm: OR=1.113 (95%CI 1.081 to 1.147) - Estradiol: OR=1.165 (95%CI 1.106 to 1.227) - Both factors: OR=1.090 (95%CI 1.026 to 1.157) <u>Severe OHSS:</u> - Number of follicles ≥ 11 mm: OR=1.105 (95%CI 1.064 to 1.148) - Estradiol: OR=1.190 (95%CI 1.115 to 1.270) - Both factors: OR=1.129 (95%CI 1.049 to 1.216) Corrected for: not reported	<u>Moderate to severe OHSS</u> Number of follicles ≥ 11 mm: - AUC: 0.728 - Optimal threshold: 19 follicles - Sensitivity: 62.3% - Specificity: 75.6% - PPV=6.9% Estradiol level: - AUC: 0.678 - Optimal threshold: 5900 pmol/L - Sensitivity: 62.3% - Specificity: 63.6% - PPV=4.8%

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				Both number of follicles and estradiol: sensitivity 72.5%; AUC=0.739 <u>Severe OHSS:</u> Number of follicles ≥ 11 mm: - AUC: 0.769 - Optimal threshold: 19 follicles - Sensitivity: 74.3% - Specificity: 75.3% - PPV=4.2% Estradiol level: - AUC: 0.731 - Optimal threshold: 6100 pmol/L - Sensitivity: 71.4% - Specificity: 64.7% - PPV=2.9%
Jayaprakasan, 2009	Patients undergoing first cycle of IVF (n=118)	OHSS	- Age: OR=1.093 (95%CI 0.908 to 1.315) - BMI: OR=0.920 (95%CI 0.764 to 1.108) - Total antral follicle count: OR=1.132 (95%CI 1.031 to 1.244) Corrected for: not reported	AUC: 0.809 Optimum cut-off value: >21 (sensitivity=83%, specificity=73%, LR+=3.1)
Jayaprakasan, 2012	1,012 consecutive subjects of all ages undergoing their first cycle of assisted reproductive techniques	Live birth & OHSS	<u>Live birth</u> - Age: OR=0.96 (95%CI 0.93 to 0.99) - AFC: OR=1.02 (95% CI 1.01 to 1.03) <u>OHSS</u> - AFC: OR=1.03 (95%CI 1.01 to 1.05)	<u>Live birth</u> AUC age: 0.58 (95%CI 0.55 to 0.62)

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			Corrected for: not reported	AUC AFC: 0.59 (95%CI 0.55 to 0.63) <u>OHSS</u> AUC: 0.74 (95%CI 0.67 to 0.82)
Johnson, 2014	406 IVF cycles with a gonadotropin releasing hormone agonist or antagonist starting during either the preceding cycle or the stimulation cycle prior to oocyte retrieval using standard protocol and gonadotropin stimulation was carried out using follicle stimulating hormone with or without luteinizing hormone)	OHSS	Age at start (reference >30 years) - ≤30 years: OR=2.46 (95%CI 1.14 to 5.34) BMI (kg/m²) (reference >30) - <25: OR=2.14 (95%CI 0.68 to 6.72) - 25-30: OR=1.99 (95%CI 0.64 to 5.63) Estradiol at trigger (pg/mL) (reference <3000) - ≥3000: OR=2.59 (95%CI 1.33 to 5.05) hCG level after trigger (IU/L) (reference <100) - 100-200: OR=1.53 (95%CI 0.60 to 3.91) - ≥200: OR=1.42 (95%CI 0.48 to 4.20) Number of oocytes (n) (reference 1-10) - 11-20: OR=6.79 (95%CI 1.97 to 23.40) - >20: OR=17.55 (95%CI 4.84–63.70) Corrected for: not reported	Not reported
Kahnberg, 2009	624 consecutive patients treated with conventional IVF or intracytoplasmic sperm injection	OHSS requiring hospitalization	Variables covering oocyte aspiration - Large, medium follicles: OR=1.076 (95%CI 1.01 to 1.15)	For oocyte aspiration:

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			- Number of follicles at aspiration: OR=1.087 (95%CI 1.02 to 1.16) - Number of aspirated oocytes: OR=1.109 (95%CI 1.03 to 1.19) Variables before the time point of hCG administration - Large, medium follicles: OR=1.165 (95%CI 1.11 to 1.22) Corrected for: not reported	Optimal threshold: 25 follicles at aspiration, 19 large/medium sized follicle before hCG and 24 oocytes Sensitivity: 82.1%; Specificity: 90% PPV: 28.1%; NPV: 99.1%; LR+: 8.3 Before the time point of hCG administration: Optimal threshold: 18 medium/large sized follicles Sensitivity: 82.1%; Specificity: 79.4% PPV: 15.8%; NPV: 99%; LR+: 4.0
Kuroda, 2021	1,435,108 oocyte retrieval cycles	Incidences of moderate-to-severe OHSS	- Age: OR=0.91 (0.90 to 0.91) - Number of retrieved oocytes: OR=1.09 (95%CI 1.09 to 1.10) Corrected for: not reported	Not reported
Lee, 2008	262 IVF cycles stimulated with long and short GnRH agonist protocols	OHSS or clinical pregnancy	<u>OHSS</u> - Age: OR= 0.9199 (95%CI 0.8181 to 1.0344) - BMI (kg/m²): OR=0.8542 (95%CI 0.6839 to 1.0668) - Basal serum AMH level: OR=1.7856 (95%CI 1.2961 to 2.4598) - Serum E2 level on day of hCG administration (pg/ml): OR=1.0005 (95%CI 1.0000 to 1.0010) - Number of follicles on day of hCG administration: OR=0.9808 (95%CI 0.7952 to 1.2098)	<u>OHSS</u> Age: AUC=0.710 (95%CI 0.652 to 0.763) Cut-off=33; sensitivity=76.2 (95%CI 52.8 to 91.7); specificity=56.0 (95%CI 49.5 to 62.4); PPV=13.1; NPV=96.4

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		- Number of oocytes collected: OR=1.0657 (95%CI 0.8652 to 1.3127) Corrected for: not reported <u>Clinical pregnancy</u> - Age: OR=0.9436 (95%CI 0.8905 to 0.9997) - BMI (kg/m²): OR=0.9963 (95%CI 0.9194 to 1.0796) - Basal serum AMH level: OR=1.0239 (95%CI 0.8520 to 1.2305) - Serum E2 level on day of hCG administration (pg/ml): OR=1.0001 (95%CI 0.9998 to 1.0004) - Number of follicles on day of hCG administration: OR=1.0456 (95%CI 0.8959 to 1.2203) - Number of oocytes collected: OR= 0.9977 (95%CI 0.8598 to 1.1577) Corrected for: not reported	<i>BMI:</i> AUC=0.612 (95%CI 0.551 to 0.670) Cut-off=18.44; sensitivity=33.3 (95%CI 14.6 to 57.0); specificity=90.3 (95%CI 85.8 to 93.7); PPV=23.3; NPV=93.9 <i>Basal serum AMH level:</i> AUC=0.902 (95%CI 0.860 to 0.934) Cut-off=3.36; sensitivity=90.5 (95%CI 69.6 to 98.5); specificity=81.3 (95%CI 75.8 to 86.0); PPV=29.7; NPV=99.0 <i>Serum E2 level:</i> AUC=0.811 (95%CI 0.759 to 0.856) Cut-off=1431; sensitivity=95.2 (95%CI 76.1 to 99.2); specificity=64.6 (95%CI 58.2 to 70.6); PPV=19.0; NPV=99.4 <i>Number of follicles (≥10 mm):</i> AUC=0.846 (0.797 to 0.887) Cut-off=11; sensitivity=95.2 (95%CI 76.1 to 99.2);
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				specificity=63.3 (95%CI 56.9 to 69.4); PPV=18.5; NPV=99.3 Number of oocytes collected: AUC=0.853 (95%CI 0.805 to 0.893) Cut-off=11; sensitivity=90.5 (95%CI 69.6 to 98.5); specificity=66.0 (95%CI 59.6 to 71.9); PPV=18.8; NPV=98.8
Lin, 2023	6931 women who had fresh embryo transfer	Severe late OHSS	Estradiol on the day of ovulation triggering (reference ≤ 3320.2 pg/mL) >3320.2 pg/mL: OR=2.20 (95%CI 1.03 to 4.68) Anti-Mullerian hormone (reference ≤ 4.62 ng/mL) >4.62 ng/mL: OR=5.44 (95%CI 2.29 to 12.90) Corrected for: not reported	Not reported
Luke, 2010	214,219 ART cycles of autologous, fresh embryo transfers to women without any treatment complications, and to those with either moderate or severe OHSS	OHSS	<u>Any OHSS</u> Female age (reference <30 years) - 30-34 years: OR=0.71 (95%CI 0.64 to 0.80) - 35-39 years: OR=0.43 (95%CI 0.38 to 0.49) - ≥ 40 years: OR=0.27 (95%CI 0.22 to 0.32) <u>Severe OHSS</u> Female age (reference <30 years) - 30-34 years: OR=0.67 (95%CI 0.54 to 0.82) - 35-39 years: OR=0.47 (95%CI 0.37 to 0.58)	Not reported

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			- ≥ 40 years: OR=0.21 (95%CI 0.15 to 0.30) Corrected for: maternal age, race and ethnicity, number of embryos transferred, and infertility diagnoses (male factor, ovulatory disorders, diminished ovarian reserve, tubal factors, uterine factors, other factors, and unexplained factors).	
Ma, 2020	300 cycles of in vitro fertilization by intracytoplasmic sperm injection/embryo transfer (IVF-ICSI/ET)	Severe OHSS	- Number of follicles on the day of hCG administration: OR=1.124 (1.027 to 1.230) Corrected for: not reported	AUC: 0.847 (95%CI 0.775 to 0.919) Optimal cut-off value of 17 (sensitivity=84.85%, specificity=77.15%)
Ni, 2022	Patients who received Long-acting GnRH agonist protocol in follicular phase for ovulation induction (n=1289)	OHSS	- High level of basal antral follicles: OR=1.06 (95%CI 1.00 to 1.12) - Female age: OR=0.92 (95%CI 0.83 to 1.02) - Polycystic ovary syndrome: OR=2.99 (95%CI 1.00 to 8.27) - High level of follicles during oocyte retrieval follicles: OR=1.09 (95%CI 1.03 to 1.14) Corrected for: not reported	AUC: 0.81
Nikbakht, 2020	Infertile and non-PCOS women with regular menstrual cycle undergoing IVF or intracytoplasmic sperm injection (n=144)	OHSS	- BMI: OR=1.434, 95%CI 1.070 to 1.921 - Number of preovulatory follicles: OR=1.539 (95%CI 1.147 to 2.063) Corrected for: not reported	Optimal cut-off for preovulatory follicles: 10 (AUC=0.86, sensitivity=80%, specificity=88%)
Schirmer, 2020	All fresh cycles (autologous and donor) and embryo-banking cycles (n = 1,833,430 cycles)	OHSS	<u>Fresh autologous cycles in which embryo transfer occurred</u> Age (reference ≥ 41): - <30 years: RR=2.27 (95%CI 1.76 to 2.92) - 30-34 years: RR=2.02 (95%CI 1.58 to 2.59) - 35-37 years: RR=1.79 (95%CI 1.39 to 2.31) - 38-40 years: RR=1.49 (95%CI 1.14 to 1.94)	Not reported

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			BMI (reference 18.5 to 24.9): - <18.5 kg/m²: RR=0.95 (95%CI 0.74 to 1.21) - 25.0 to 29.9 kg/m²: RR=0.82 (95%CI 0.75 to 0.90) - ≥30.0 kg/m²: RR=0.66 (95%CI 0.59 to 0.74) Number of oocytes retrieved (reference 11-15): - 0-10 oocytes: RR=0.37 (0.32 to 0.42) - 16-30 oocytes: RR=1.90 (1.73 to 2.08) - >30 oocytes: RR=3.85 (3.36 to 4.41) <u>Fresh autologous cycles and embryo-banking cycles</u> Age (reference ≥41): - <30 years: RR=6.47 (5.46 to 7.66) - 30-34 years: RR=4.97 (4.22 to 5.86) - 35-37 years: RR=3.43 (2.89 to 4.06) - 38-40 years: RR=2.12 (1.77 to 2.54) BMI (reference 18.5 to 24.9): - <18.5 kg/m²: RR=0.99 (95%CI 0.85 to 1.15) - 25.0 to 29.9 kg/m²: RR=0.86 (95%CI 0.80 to 0.92) - ≥30.0 kg/m²: RR=0.70 (95%CI 0.65 to 0.76) Corrected for age, race, body mass index, previous pregnancy, current pregnancy, diagnosis of ovulatory disorder, uterine factor, tubal factor, endometriosis, diminished ovarian reserve, unexplained infertility, number of oocytes retrieved, GnRH antagonist use for pituitary suppression, and embryo-banking cycle.	
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Shields, 2016 <i>case-control study</i>	Women undergoing IVF treatment through Monash IVF with OHSS as cases (n=162) and who did not have OHSS as controls (n=3756)	OHSS	- Age: IRR=0.60 (95%CI 0.52 to 0.69) - BMI (kg/m²): IRR=1.10 (95%CI 0.96 to 1.26) - Max E2 concentration: IRR=1.43 (95%CI 1.31 to 1.57) - Number of follicles: IRR=1.40 (95%CI 1.29 to 1.52) Corrected for: not reported	ROC area: 0.846 (95%CI 0.816 to 0.876) Sensitivity: 81.7% (74.3 to 87.7%) Specificity: 75.6% (74.2 to 77.0%)
Steward, 2014	256,381 fresh autologous in vitro fertilization (IVF) cycles	Live birth & OHSS	<u>Live birth (reference group of 11-15 retrieved oocytes)</u> - 0-5 oocytes: OR=0.46 (95% CI 0.44 to 0.48) - 6-10 oocytes: OR=0.83 (95% CI 0.80 to 0.85) - 16-20 oocytes: OR=1.06 (95% CI 1.03 to 1.1) - 21-25 oocytes: OR=1.04 (95% CI 1 to 1.08) - >25 oocytes: OR=0.91 (95% CI 0.87 to 0.95) <u>OHSS (reference group of 11-15 retrieved oocytes)</u> - 0-5 oocytes: OR=0.09 (95%CI 0.05 to 0.15) - 6-10 oocytes: OR=0.39 (95%CI 0.32to 0.47) - 16-20 oocytes: OR=1.62 (95% CI 1.41 to 1.86) - 21-25 oocytes: OR=2.93 (95% CI 2.55 to 3.36) - >25 oocytes: OR=6.16 (95% CI 5.44 to 6.98) Corrected for: age, BMI, basal FSH, and smoking status	Optimal cut-off point for OHSS: 15 oocytes (sensitivity=71.1%, specificity=72.4%) AUC=0.784. Live birth AUC=0.596
Tarlatzis, 2017	All fresh IVF cycles with ovarian stimulation performed with gonadotrophins and GnRH agonists or antagonists and triggering of final oocyte maturation was induced with the administration of urinary or recombinant hCG (2982 patients undergoing 5493 cycles)	Moderate or severe OHSS	<u>Severe OHSS</u> Single predictors: - Number of follicles ≥10 mm: OR=1.18 (95%CI 1.13 to 1.23) - E2 on the day of hCG: OR=2.80 (95%CI 1.80 to 4.37) Follicles and E2 on the day of hCG and total FSH dose model: - Number of follicles ≥10 mm: OR=1.12 (95%CI 1.05 to 1.20) - E2 on the day of hCG (per 1000 pg/mL): OR=1.89 (95%CI 0.93 to 3.83) Corrected for: not reported	<u>Severe OHSS</u> Single predictors: Number of follicles ≥10 mm AUC=0.904 (95%CI 0.895 to 0.912) Cut-off: ≥15; sensitivity=89.5 (95%CI 74.0 to 99.0); specificity=82.9 (80.6 to 82.7); PLR=5.19; NLR=0.13 Single predictors: E2 on day of hCG

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			Serum anti-mullerian hormone: OR=0.90 (95%CI 0.74 to 1.08) Corrected for: number of follicles ≥ 10 mm on the day of hCG trigger PCOS: OR=1.63 (95%CI 0.27 to 9.99) Corrected for: total number of follicles ≥ 10 mm <u>Moderate OHSS</u> Single predictors: - Number of follicles ≥ 10 mm: OR=1.14 (95%CI 1.11 to 1.17) - E2 on the day of hCG (per 1000 pg/mL): OR=1.80 (95%CI 1.50 to 2.15) Follicles and E2 on the day of hCG and total FSH dose model: - Number of follicles ≥ 10 mm: OR=1.12 (95%CI 1.08 to 1.16) - E2 on the day of hCG (per 1000 pg/mL): OR=1.16 (95%CI 0.88 to 1.52) Corrected for: not reported	AUC= 0.790 (95%CI 0.779 to 0.801) Cut-off: ≥ 2.201; sensitivity=85.0 (95%CI 62.1 to 96.8); specificity=71.8 (95%CI 70.5 to 72.9); PLR=3.01; NLR=0.21 Number of follicles and E2 on the day of hCG and total FSH dose model: AUC=0.916 (0.908–0.923) Cut-off= >0.0054; sensitivity=84.2(95%CI 60.4 to 96.6); specificity=85.9 (95%CI 84.9 to 86.9); PLR=5.98; NLR=0.18 <u>Moderate OHSS</u> Single predictors: Number of follicles ≥ 10 mm AUC=0.787 (95%CI 0.775 to 0.798) Cut-off: ≥ 12; sensitivity=74.7 (95%CI 62.9 to 84.2); specificity=70.4 (69.1 to 71.6); PLR=2.52; NLR=0.36 Single predictor E2 on day of hCG: AUC=0.691 (95%CI 0.678 to 0.703); Cut-off=≥ 1.540; sensitivity=85.1 (95%CI 75.0 to 92.3);
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				specificity=47.4 (95%CI 46.0 to 48.7); PLR=1.62; NLR=0.31 Number of follicles and E2 on the day of hCG and total FSH dose model: AUC=0.796 (95%CI 0.785 to 0.807) Cut-off=>0.0127; sensitivity=80.3 (95%CI 69.1 to 88.8); specificity=69.7 (95%CI 68.4 to 70.9); PLR=2.65; NLR=0.28
Xu, 2021 <i>case-control study</i>	Total of 21,222 ovarian stimulation cycles were collected among women undergoing assisted reproductive technology, among which 84 patients with late-onset OHSS and control cases were the remaining 21,138	OHSS	Estradiol level on hCG triggering ovulation: OR=1.0000 (95%CI 1.0000 to 1.0001) Corrected for: not reported	Not reported

Abbreviations: NPCOS=non-polycystic ovary syndrome; LR+=positive likelihood ratio; PPV=positive predictive value; NPV=negative predictive value; PLR=positive likelihood ratio; NLR=negative likelihood ratio