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Pre-hCG variables associated with occurrence of ascites in IVF/ICSI patients at moderate risk of developing OHSS: A pilot investigation

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ABSTRACT

Objective: To identify predictors of ascites collected prior to the hCG administration in patients undergoing IVF/ICSI treatment at moderate risk of developing moderate/severe ovarian hyperstimulation syndrome (OHSS), and, based on these predictors, develop a nomogram for estimation of the probability of presence of ascites. Methods and Materials: Data were derived from 53 patients with 20 - 30 follicles ≥10 mmat end of stimulation. All patients received a single dose of hCG (250 mg) to trigger final follicular maturation when ≥2 follicles of ≥18 mmwere observed. Transvaginal ultrasound to measure ascites (total amount of peritoneal fluid ≥9 cm2inlithotomy position) was performed 2, 5 and 8 days after the hCG administration. Associations between clinical, sonographic and endocrinological variables recorded prior to the hCG administration and presence of ascites were analyzed by univariable and multivariable logistic regression. Results: Thirty-four patients (64%) had ultrasonic evidence of ascites. The multivariable analysis identified the total number of follicles [OR 1.29 (95% CI: 1.02 - 1.69, P = 0.043)], the ovarian volume [OR 1.05 (95% CI: 1.00 - 1.11, P = 0.047)] and BMI [OR 0.76 (95% CI: 0.56 - 0.99, P = 0.053)] as predictors of ascites (AUC = 0.825). A nomogram (PROFET) was designed with these three variables for individual prediction of the probability of development of ascites. Conclusions: This pilot investigation indicates that the risk of peritoneal fluid accumulation in IVF/ICSI patients at moderate risk of developing moderate/severe OHSS is influenced by the number of follicles and the ovarian volume on the day of hCG administration as well as the BMI.

KEYWORDS
Ascites; IVF; OHSS; Ovarian Stimulation; Prediction

Cite this paper
Fernández-Sánchez, M. , Broberg, P. , Pettersson, G. , Busso, C. , Pellicer, A. and Arce, J. (2013) Pre-hCG variables associated with occurrence of ascites in IVF/ICSI patients at moderate risk of developing OHSS: A pilot investigation. *Open Journal of Obstetrics and Gynecology*, 3, 13-20. doi: 10.4236/ojog.2013.31004.

References

[1]   Golan, A. and Weissman, A. (2009) Symposium: Update on prediction and management of OHSS. A modern classification of OHSS. Reproductive Biomedicine Online, 19, 28-32. doi:10.1016/S1472-6483 (10)60042-9

[2]   Rabau, E., David, A., Serr, D.M, Mashiach, S. and Lunenfeld, B. (1967) Human menopausal gonadotropins for anovulation and sterility. Results of 7 years of treatment. American Journal of Obstetrics and Gynecology, 98, 92-98.

[3]   Schenker, J.G. and Weinstein. D. (1978) Ovarian hyperstimulation syndrome: A current survey. Fertility and Sterility, 30, 255-268.

[4]   Golan, A., Ronel, R., Herman, A., Soffer, Y., Weinraub, Z. and Caspi, E. (1989) Ovarian hyperstimulation syndrome: An update review. Obstetrical and Gynecological Survey, 44, 430-440.

doi:10.1097/00006254-198906000-00004

[5]   Navot, D., Relou, A., Birkenfeld, A., Rabinowitz, R., Brzezinski, A. and Margalioth, E.J. (1988) Risk factors and prognostic variables in the ovarian hyperstimulation syndrome. American Journal of Obstetrics and Gynecology, 159, 210-215.

[6]   Rizk, B. and Aboulghar, M.A. (1999) Classification, pathophysiology and management of ovarian hyperstimulation syndrome. In: Brinsden, P., Ed., In-Vitro Fertilization and Assisted Reproduction. The Parthenon Publishing Group, New York, London, 131-155.

[7]   Delvigne, A. and Rozenberg, S. (2002) Epidemiology and prevention of ovarian hyperstimulation syndrome (OHSS): A review. Human Reproduction Update, 8, 559-577. doi:10.1093/humupd/8.6.559

[8]   Aboulghar, M. (2009) Symposium: Update on prediction and management of OHSS. Prevention of OHSS. Reproductive Biomedicine Online, 19, 33-42. doi:10.1016/S1472-6483(10)60043-0

[9]   Humaidan, P., Quartarolo, J. and Papanikolaou, E.G. (2010) Preventing ovarian hyperstimulation syndrome: Guidance for the clinician. Fertility and Sterility, 94, 389-400. doi:10.1016/j.fertnstert.2010.03.028

[10]   Delvigne, A. (2009) Symposium: Update on prediction and management of OHSS. Epidemiology of OHSS. Reproductive Biomedicine Online, 19, 8-13. doi:10.1016/S1472-6483(10)60040-5

[11]   Papanikolaou, E.G., Humaidan, P., Polyzos, N.P. and Tarlatzis, B. (2010) Identification of the high-risk patient for ovarian hyperstimulation syndrome. Seminars in Reproductive Medicine, 28, 458-462. doi:10.1055/s-0030-1265671

[12]   Delvigne, A., Demoulin, A., Smitz, J., Donnez, J., Koninckx, P., Dhont, M., Englert, Y., Delbeke, L., Darcis, L., Gordts, S., Puttemans, P., Gerris, J., Schoysman, R. and Leroy, F. (1993) The ovarian hyperstimulation syndrome in in-vitro fertilization: A Belgian multicentric study. I. Clinical and biological features. Human Reproduction, 8, 1353-1360.

[13]   Enskog, A., Henriksson, M., Unander, M., Nilsson, L. and Brannstrom, M. (1999) Prospective study of the clinical and laboratory variables of patients in whom ovarian hyperstimulation syndrome developed during controlled ovarian hyperstimulation for in-vitro fertilization. Fertility and Sterility, 71, 808-814. doi:10.1016/S0015-0282(99)00090-4?

[14]   Tummon, I., Gavrilova-Jordan, L., Allemand, M.C. and Session, D. (2005) Polycystic ovaries and ovarian hyperstimulation syndrome: A systematic review. Acta Obstetrica et Gynecologica Scandinavica, 84, 611-616. doi:10.1080/j.0001-6349.2005.00788.x

[15]   [Nakhuda, G.S., Chu, M.C., Wang, J.G., Sauer, M.W. and Lobo, R.A. (2006) Elevated serum müllerian-inhibiting substance may be a marker for ovarian hyperstimulation syndrome in normal women undergoing in-vitro fertilization. Fertility and Sterility, 85, 1541-1543. doi:10.1016/j.fertnstert.2005.10.052

[16]   Practice Committee of the American Society of Reproductive Medicine (2008) Ovarian hyperstimulation syndrome. Fertility and Sterility, 90, S188-S193. doi:10.1016/j.fertnstert.2008.08.034

[17]   Jayaprakasan, K., Jayaprakasan, R., Al-Hasie, H.A., Clewes, J.S., Campbell, B.K., Johnson, I.R. and RaineFenning, N.J. (2009) Can quantitative three-dimensional power Doppler angiography be used to predict ovarian hyperstimulation syndrome? Ultrasound in Obstetrics & Gynecology, 33, 583-91. doi:10.1002/uog.6373

[18]   Luke, B., Brown, M.B., Morbeck, D.E., Hudson, S.B., Coddington 3rd, C.C. and Stern, J.E. (2010) Factors associated with ovarian hyperstimulation syndrome (OHSS) and its effect on assisted reproductive technology (ART) treatment and outcome. Fertility and Sterility, 94, 1399-1404. doi:10.1016/j.fertnstert.2009.05.092

[19]   Youssef, M.A., Van der Veen, F., Al-Inany, H.G., Griesinger, G., Mochtar, M.H., Aboulfoutouh, I., Khattab, S.M. and van Wely, M. (2011) Gonadotropin-releasing hormone agonist versus HCG for oocyte triggering in antagonist assisted reproductive technology cycles. Cochrane Database of Systematic Reviews, 1, Article ID: CD008046. doi:10.1002/14651858.CD008046.pub3

[20]   Blankstein, J., Shalev, J., Saadon, T., Kukia, E.E., Rabinovici, J., Pariente, C., Lunenfeld, B., Serr, D.M. and Mashiach, S. (1987) Ovarian hyperstimulation syndrome: Prediction by number and size of preovulatory ovarian follicles. Fertility and Sterility, 47, 597-602.

[21] MacDougall, M.J., Tan, S.L. and Jacobs, H.S. (1992) Invitro fertilization and the ovarian hyperstimulation syndrome. Human Reproduction, 7, 597-600.

[22] Aboulghar, M. (2003) Prediction of ovarian hyperstimulation syndrome (OHSS). Estradiol level has an important role in the prediction of OHSS. Human Reproduction, 18, 1140-1141. doi:10.1093/humrep/deg208

[23] Asch, R.H., Li, H.P., Balmaceda, J.P., Weckstein, L.N. and Stone, S.C. (1991) Severe ovarian hyperstimulation syndrome in assisted reproductive technology: Definition of high risk groups. Human Reproduction, 6, 1395-1399.

[24] Mocanu, E., Redmond, M.L., Hennelly, B., Collins, C. and Harrison, R. (2007) Odds of ovarian hyperstimulation syndrome (OHSS)—Time for reassessment. Human Fertility (Cambridge), 10, 175-181. doi:10.1080/14647270701194143

[25] Aramwit, P., Pruksananonda, K., Kasettratat, N. and Jammeechai, K. (2008) Risk factors for ovarian hyperstimulation syndrome in Thai patients using gonadotropins for in vitro fertilization. American Journal of Health-System Pharmacy, 65, 1148-1153. doi:10.2146/ajhp070566

[26] álvarez, C., Martí-Bonmatí, L., Novella-Maestre, E., Sanz, R., Gómez, R., Fernández-Sánchez, M., Simón, C. and Pellicer, A. (2007) Dopamine agonist cabergoline reduces hemoconcentration and ascites in hyperstimulated women undergoing assisted reproduction. Journal of Clinical Endocrinology & Metabolism, 92, 2931-2937. doi:10.1210/jc.2007-0409

[27] Busso, C.E., Garcia-Velasco, J., Gomez, R., Alvarez, C., Simón, C. and Pellicer, A. (2009) Symposium: Update on prediction and management of OHSS. Prevention of OHSS—Dopamine agonists. Reproductive Biomedicine Online, 19, 43-51. doi:10.1016/S1472-6483(10)60044-2

[28] D' Angelo, A., Brown, J. and Amso, N.N. (2011) Coasting (withholding gonadotrophins) for preventing ovarian hyperstimulation syndrome. Cochrane Database of Systematic Reviews, 6, Article ID: CD002811. doi:10.1002/14651858.CD002811.pub2

[29] Tang, H., Hunter, T., Hu, Y., Zhai, S.D., Sheng, X. and Hart, R.J. (2012) Cabergoline for preventing ovarian hyperstimulation syndrome. Cochrane Database of Systematic Reviews, 2, Article ID: CD008605. doi:10.1002/14651858.CD008605.pub2

[30] Busso, C., Fernández-Sánchez, M., García-Velasco, J.A., Landeras, J., Ballesteros, A., Mu?oz, E., González, S., Simón, C., Arce, J.C. and Pellicer, A. (2010) The nonergot derived dopamine agonist quinagolide in prevention of early ovarian hyperstimulation syndrome in IVF patients: A randomized, double-blind, placebo-controlled trial. Human Reproduction, 25, 95-1004. doi:10.1093/humrep/deq005

[31] Donoho, D. and Jin, J. (2008) Higher criticism thresholding: Optimal feature selection when useful features are rare and weak. Proceedings of the National Academy of Sciences, 105, 14790-14795. doi:10.1073/pnas.0807471105

[32] Danninger, B., Brunner, M., Obruca, A. and Feichtinger, W. (1996) Prediction of ovarian hyperstimulation syndrome by ultrasound volumetric assessment [corrected] of baseline ovarian volume prior to stimulation. Human Reprodution, 11, 1597-1599. doi:10.1093/oxfordjournals.humrep.a019451

[33] Navot, D., Bergh, P.A. and Laufer, N. (1992) Ovarian hyperstimulation syndrome in novel reproductive technologies: Prevention and treatment. Fertility and Sterility, 58, 249-261.

[34] Jayaprakasan, K., Herbert, M., Moody, E., Stewart, J.A. and Murdoch, A.P. (2007) Estimating the risks of ovarian hyperstimulation syndrome (OHSS): Implications for egg donation for research. Human Fertility (Cambridge), 10, 183-187. doi:10.1080/14647270601021743

[35] Dahl Lyons, C.A., Wheeler, C.A., Frishman, G.N., Hackett, R.J., Seifer, D.B. and Haning, R.V. (1994) Early and late presentations of the ovarian hyperstimulation syndrome: Two distinct entities with different risk factors. Human Reproduction, 9, 792-799.

[36] Oyesanya, O.A., Parsons, J.H., Collins, W.P. and Campbell, S. (1995) Total ovarian volume before human chorionic gonadotrophin administration for ovulation induction may predict the hyperstimulation syndrome. Human Reproduction, 10, 3211-3212.

[37] Haning Jr., R.V., Austin, C.W., Carlson, I.H., Kuzma, D.L., Shapiro, S.S. and Zweibel, W.J. (1983) Plasma estradiol is superior to ultrasound and urinary estriol glucuronide as a predictor of ovarian hyperstimulation during induction of ovulation with menotropins. Fertility and Sterility, 40, 31-36.

[38]   Hendriks, D.J., Klinkert, E.R., Bancsi, L.F., Looman, C.W., Habbema, J.D., te Velde, E.R. and Broekmans, F.J. (2004) Use of stimulated serum estradiol measurements for the prediction of hyperresponse to ovarian stimulation in in vitro fertilization (IVF). Journal of Assisted Reproduction and Genetics, 21, 65-72. doi:10.1023/B:JARG.0000027016.65749.ad

[39]   Papanikolaou, E.G., Pozzobon, C., Kolibianakis, E.M., Camus, M., Tournaye, H., Fatemi, H.M., Van Steirteghem, A. and Devroey, P. (2006) Incidence and prediction of ovarian hyperstimulation syndrome in women undergoing gonadotropin-releasing hormone antagonist in vitro fertilization cycles. Fertility and Sterility, 85, 112-120. doi:10.1016/j.fertnstert.2005.07.1292

[40]   Stolwijk, A.M., Zielhuis, G.A., Hamilton, C.J., Straatman, H., Hollanders, J.M., Goverde, H.J., van Dop, P.A. and Verbeek, A.L. (1996) Prognostic models for the probability of achieving an ongoing pregnancy after in-vitro fertilization and the importance of testing their predictive value. Human Reproduction, 11, 2298-2303. doi:10.1093/oxfordjournals.humrep.a019092

[41]   Stolwijk, A.M., Straatman, H., Zielhuis, G.A., Jansen, C.A., Braat, D.D., van Dop, P.A. and Verbeek, A.L. (1998) External validation of prognostic models for ongoing pregnancy after in-vitro fertilization. Human Reproduction, 13, 3542-3549. doi:10.1093/humrep/13.12.3542.