

ESTROGEN LEVEL FOR PREVENTING OVARIAN HYPERSTIMULATION SYNDROME

Objective: Ovarian hyperstimulation syndrome (OHSS) is a serious complication of infertility treatment. In OHSS, there is a marked elevation in estrogen (E2) levels, which could be associated with a risk of developing the syndrome. Many strategies to prevent OHSS depend on the ability to predict the probability of OHSS occurring. The objectives of this study were to assess the E2 value on day 3 and 5 of ovarian stimulation as predictors of risk of developing OHSS, in order to identify who are at high risk of developing OHSS, which allow us prevent that event.

Design: Retrospective case-control study

Material and Methods: 36 women undergoing assisted reproduction treatment between 23 and 36 years old were included in study; they have been divided in study group (n = 13), which OHSS occurred after ovarian stimulation and control group (n = 23) which didn't presented OHSS. Patients were treated using down-regulation with (GnRH) agonists followed by controlled ovarian stimulation protocol with rFSH. The serum E2 levels were measured by quimioluminescence, on day 3 (before commencing ovarian stimulation) and day 5 of ovarian stimulation. The results of E2 levels were correlated with OHSS occurrence. Statistical analyses were performed using Mann-Whitney and Logistic Regression, with $p < 0.05$ considered statistically significant.

Results: The mean (SD) E2 levels on day 3 of stimulation, were similar between groups (54.00 pg/ml \pm 17.17 and 63.57 pg/ml \pm 34.36, $p = 0.633$; in study and control groups, respectively). On day 5, the mean (SD) E2 level was significantly higher in study group (464.46 pg/ml \pm 202.78) than control group (218.27 pg/ml \pm 111.62) ($p < 0.001$). Moreover, we could retrieve more oocyte on study group than control group ($p < 0.001$). It was also evaluated the reason between mean of E2 levels on day 5 and day 3, and we could

observe that in study group, the mean reason (8.87 ± 4.11) was higher than control group (3.52 ± 1.96) ($p < 0.001$). So, we are thought that, if E2 levels on day 5 have been higher than 300 pg/ml, and if the reason between day 5 and day 3 has been higher than six, women are at high risk for OHSS.

With that results, it have been created an equation to calculate the probability of women, undergoing this kind of ovarian stimulation, of having OHSS according to the serum E2 levels on days 3 and day 5 of stimulation. This equation was tested in our samples and shown 94.8% of correct prediction. The equation is:

$$y = \frac{\exp^{-2,1155-0,0822 \cdot D3+0,022 \cdot D5}}{1 + \exp^{-2,1155-0,0822 \cdot D3+0,022 \cdot D5}}$$

Legend: D3 = E2 levels on day 3 of stimulation

D5 = E2 levels on day 5 of stimulation

Conclusions: These results associated with the equation have been shown the probability of women having OHSS earliness, in as much as, it is possible modify the gonadotropins dose in according to the probability results earlier due to safety and ethical concern, avoiding an OHSS occurrence. Additional studies are required to support the E2 levels value to prevent OHSS, using other ovarian stimulation protocols.