Use of In Vitro Fertilisation Prediction Model in an Asian Population—Experience in Singapore

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Abstract

Introduction: This retrospective study was conducted to perform an external validation of the in vitro fertilisation (IVF) predict model developed by Scott Nelson et al in an Asian population. Materials and Methods: All IVF cycles registered in the study centre from January 2005 to December 2010 were included. Observed and predicted values of at least 1 live birth per cycle were compared by discrimination, calibration. Hosmer-Lemeshow test was used to assess the goodness-of-fit of the model calibration and Brier score was used to assess overall model performance. Results: Among 634 IVF cycles, rate of at least 1 live birth was 30.6%. Causes of infertility were unexplained in 35.5% cases. Fifty-seven percent of women came for their first IVF treatment. First IVF cycle showed significantly higher success in comparison to subsequent cycles. The odds ratio of successful live birth was worse in women with endometriosis. Observed outcome was found to be more than the prediction of the model. The area under the curve (AUC) in this study was found to be 0.65 that was close to that of Nelson model (0.6335) done in internal validation. Brier score (average prediction error) of model was 0.2. Chi square goodness-of-fit test indicated that there was difference between the predicted and observed value ($\chi^2 = 18.28$, df = 8, $P = 0.019$). Overall statistical findings indicated that the accuracy of the prediction model fitted poorly with the study population. Conclusion: Ovarian reserve, treatment centre and racial effect on predictability cannot be excluded. So it is important to make a good prediction model by considering the additional factors before using the model widely.

Key words: Infertility, External validation, Live birth

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