Understanding reproducibility of human IVF traits to predict next IVF cycle outcome; Common mistake

Siamak Sabour

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I was interested to read the paper by Wu B and colleagues published in the Oct 2014 issue of J Assist Reprod Genet [1]. The authors estimated reproducibility of IVF traits including number of oocytes retrieved, oocyte maturity, fertilization, embryo quality and pregnancy using the inter-class (Pearson) correlation coefficient between the repeated IVF cycle measurements for the same patient by variance component analysis [1].

They reported that the number of oocytes retrieved from patients and their fertilization rate had the highest reproducibility coefficients ($r=0.81\sim0.84$), which indicated a very close correlation between the first retrieval cycle and subsequent IVF cycles. Oocyte maturity and number of top quality embryos had middle level reproducibility ($r=0.38\sim0.76$) and pregnancy rate had a relative lower reproducibility ($r=0.23\sim0.27$) [1]. This result has nothing to do with reliability analysis and actually is one of the common mistakes [2–4]. Figure 1 shows non reproducibility illustrated by dotted line; however, we will get high correlation coefficients in all situations ($r>0.8$). It is important to know that concluding reproducibility in such situations is a common mistake.

They concluded that their results allow them to predict future IVF cycle outcomes. For prediction studies, we need two different cohort data set or at least one splitted cohort dataset to develop our prediction model and then to validate our model [2,3,5].

Such a conclusion may lead to a misleading message; therefore, mismanagement of the patients cannot be avoided [3–6].

S. Sabour (✉)
Safety Promotion and Injury Prevention Research Center, Shahid
Beheshti University of Medical Sciences, Tehran, I.R., Iran
e-mail: s.sabour@sbmu.ac.ir

S. Sabour
Department of Clinical Epidemiology, School of Health, Shahid
Beheshti University of Medical Sciences, Tehran, I.R., Iran

Fig. 1 Cases when Pearson correlation coefficient fails to detect non reproducibility

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References

1. Wu B, Shi J, Zhao W, Lu S, Silva M, Gelety TJ. Understanding reproducibility of human IVF traits to predict next IVF cycle outcome. *J Assist Reprod Genet.* 2014;31(10):1323–30. doi:[10.1007/s10815-014-0288-y](https://doi.org/10.1007/s10815-014-0288-y). Epub 2014 Aug 15.
2. Lawrence I, Kuei L. A concordance correlation coefficient to evaluate reproducibility. *Biometrics.* 1989;45:255–68.
3. Rothman KJ, Greenland S, Lash TL. *Modern epidemiology.* 4th ed. Baltimore: Lippincott Williams & Wilkins; 2010.
4. Szklo M, Nieto FJ. *Epidemiology beyond the basics.* 2nd ed. Manhattan: Jones and Bartlett Publisher; 2007.
5. Sabour S, Ghassemi F. Predictive value of confocal scanning laser for the onset of visual field loss. *Ophthalmology.* 2013;120(6):e31–2. doi:[10.1016/j.optha.2013.01.055](https://doi.org/10.1016/j.optha.2013.01.055).
6. Sabour S. Methodologic concerns in reliability of noncalcified coronary artery plaque burden quantification. *AJR Am J Roentgenol.* 2014;203(3):W343.