

Multivariate prediction model for IVF results: a tool to get benchmark

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A correct evaluation of the effectiveness of human in vitro fertilization (IVF) is crucial to allow its own progress, to introduce into the clinical practice new, experimental tools (medications, procedures, etc.), properly understanding if they represent or not a real advantage in terms of outcome. To date, the evaluation of new tools potentially able to improve IVF results is accomplished by means of clinical studies that compare, retrospectively or prospectively, a given idea (e.g. a new ovarian stimulation protocol) with one or more existing ones, whose effectiveness has already been clinically proven. Prospective, randomized, controlled trials (RCTs) are considered the best way to test new ideas, whereas retrospective studies give a lower quality information, but still are widely used when a high number of observations is required and a RCT would have unsustainable costs or would take a too long time. Metanalyses are also quite popular to achieve scientific evidence, but to be really informative they should include homogeneous, well designed, bias-free studies: in real life this happens very rarely, and metanalyses import in their statistics any bias encountered in the included studies, who are often quite heterogeneous. Comparing two procedures unavoidably implies that patients enrolled in subgroups A and B (receiving treatment A and B, respectively) are different: in RCTs they are randomly distributed, in retrospective studies they are "matched" for clinical characteristics, but in any case they are different patients.

The idea of "benchmark" has arisen to overcome this problem and to add a new possibility to evaluate IVF results. A benchmark is the effectiveness I should obtain in a given patients' subgroup with the currently used treatment; the benchmark (what I should obtain) may be compared to the real results in that subgroup (what I effectively obtain) allowing to compare the outcomes of a new treatment vs. a already known treatment in the same patients. How can a benchmark be calculated?

My talk shows how a prediction model for live birth rate in IVF was developed in the last years, and how it may be used to precisely calculate the benchmark for a given patients' population. It also shows how the prediction model allows to compare new treatments (medications, procedures, etc.) with those currently used and may be applied to any IVF Unit without relevantly change the work algorithm.

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