**High quality science in Reproductive Medicine**

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The randomized controlled trial - usually comparing a novel treatment strategy with the standard of care - is generally considered the highest level of scientific evidence. The personal views of the opinion leader opinion or the senior doctor was no longer enough to justify interventions. Ultimately, the combined analysis of multiple RCTs - referred to as meta analysis - is considered to be as close as possible to the ‘*truth*’. According to some, at present more than 50% of all medical literature consists of meta analyses. For sure, throughout medicine over the last 3 decades this approach has disclosed numerous widely applied interventions to be of little – if any - clinical value. Example in the field of Reproductive Medicine include, so called add-on adjuvant interventions in IVF, aneuploidy screening of embryos, and the use of the embryoscope in the laboratory.

However, the validity of RCTs as the holy grail of the truth is increasingly questioned. Various shortcomings of RCTs deserve further attention, such as; (the often narrow) patient inclusion criteria, which interventions are being compared, the primary study endpoint used in the trial, and the anticipated effect size influencing the number of patients to be included in the trial. Less than 10% of all scientific publications involve RCTs, and even in such trials often surrogate outcomes are being used.

In clinical trials the primary study endpoint is often decided by the investigator. Such an endpoint may not represent what is most important for patients. In addition, cost, burden of treatment and complication rates are rarely considered in intervention studies. Recent trends in patientcare such as ‘value based healthcare’ (Porter), or ‘shared decision making’ (Wennberg) put much more emphasize on involving patients in deciding what should be considered the most desired treatment outcome given their specific circumstances. RCTs represent the science of means, and largely ignores the characteristics and context of individual patients.

A different research strategy is required in order to develop patient tailored care. Key approaches in precision medicine include prospective cohort follow-up studies, extensive standardized phenotyping of patients, big data (and possibly artificial intelligence) and the use of multi-variate prediction analysis. Such individualized treatment strategies have already been widely implemented in areas like oncology and cardiovascular disease, but so far reproductive medicine is lacking behind.

In conclusion, RTCs represent a sophisticated way to assess potential differences in *means* of various interventions tested. In every day practice, we as physicians treat individuals not groups. Every individual is different from one another. In the current era of ‘*precision medicine’* (also referred to as patient tailored medicine) the aim is to establish the optimal treatment for a given individual based on personal circumstances and preference (so called *shared decision making*), patient characteristics including biomarkers and in the future genomics findings, using multi-variate prediction models. Big data and artificial intelligence may further fine tune such treatment alogorithms.