The New 2010 WHO Manual and the Need to Address some Related Dilemmas

Regarding the variations in the quality of semen analysis, several papers have critically reviewed the diverse semen analysis results from a large number of studies carried out in different races and geographical areas over a long period of time. Most of these studies indicate decreased semen quality, especially sperm concentration (counts to less than 50%) and morphology between the years 1940 – 1990 (1). Nevertheless, the major problem of these meta-analyses is the use of collected data from different regions done in different time intervals with a wide range of methods and different levels of standardization. Most of these studies have problems in their case inclusion criteria, number of cases, size of the study and the employed techniques for semen analysis, which could negatively affect the results severely. As an example, many companies that provide external quality control for andrology laboratories, such as UK-NEQAS, have shown that in spite of the current WHO guidelines for semen analysis, the evaluated laboratories, inside and outside UK, are using different procedures and criteria for semen analysis. For example, WHO has recommended the use of improved Neubauer or Makler chamber to determine sperm counts, however, the reported chambers used by laboratories include: 1- Burker-turk, 2- Fast Read, 3- Fuchs Rosenthar, 4- Horwell, 5- Improved Neubauer, 6- Ieja, 7- Makler, 8- Microcell, 9- SQA-A, 10- CASA, 12- Weber or other local chambers and even without any chamber that may severely influence the accuracy of the results and also the criteria for the evaluation of sperm morphology and motility.

The major problems faced in semen analyses are both their interpretations that are prone to subjective judgment and the difficulty to standardize them in the absence of absolute quantitative values for each parameter.

WHO published a manual to address the wide variations in procedures and results of semen analysis between individuals and laboratories. The WHO laboratory manual for semen analysis has remained as the Bible of andrology in both research and clinic. Despite being an imperfect tool in the work-up of infertile couples, it has a critical role in providing standards for andrology laboratories (2, 3).

One of the most important roles of this manual is to provide a simplified method to determine sperm concentration, motility and morphology with high accuracy and precision in laboratories with minimum levels of facility and staff and with limited scientific or practical skills. Five editions of the manual have been published so far (1980, 1987, 1992, 1999 and 2010) and the new 2010 edition provides more specific guidelines for the analysis of sperm parameters and more detailed information on each parameter in comparison with previous editions. In this version, new tests for the evaluation of sperm functions have been included in a chapter titled “Research Procedures” (4).

Application of new values in the 2010 WHO laboratory manual, especially for normal forms of sperm morphology, has been kept very low as they could severely change the clinical management of patients. Therefore, most cases that were categorized as male factor infertility in the past are now considered in the normal range with no need for further medical or clinical intervention except the time for a natural conception. In contrast to WHO 2010, the values in the previous versions were too high leading to irrelevant diagnosis and unnecessary treatment of healthy men who were falsely diagnosed as subfertile men.

To obtain normal semen parameters for the new version, a large sample size (4500 men) was selected from 14 countries in 4 continents. Despite taking into account all the probable confounding factors in case selection, data analysis and statistical methods, the new version contains some values with several unspecified points that have to be outlined here. For example, one can not contently categorize fertile and infertile men based on the narrow difference in values for sperm normal morphology, respectively 4% and 2%, or the narrow difference between the values for abnormal forms, respectively 96% and 98%, to achieve normal pregnancy or to be a candidate for ART. Whether or not we can regard normal sperm morphologies greater than 3% as a tool for ruling out male factor infertility in such cases remains to be explored and similar concerns about the new 2010 version have to go through the test of time and further in-depth studies.

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