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Quality Control of Laboratory Methods for Semen Evaluation in a Multicenter Research Study

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Rigorously standardized laboratory protocols and strict quality control (QC) are essential for meaningful comparisons between semen quality data from multiple sites. We describe our experience with the Study for Future Families (SFF), a multicenter study of semen quality in the United States. Detailed protocols were developed, and technicians from each study site attended a training session at the central laboratory. Technicians received blinded replicates from diluted semen specimens for counting by MicroCell and hemacytometer. Sperm motility was assessed using videotaped recordings for simple percent motility and categorical assessment of individual sperm progression as recommended by the World Health Organization (WHO). The mean intertechnician coefficient of variation for individual specimens was 12.6% for MicroCell counts, 15.2% for hemacytometer counts, and 10.5% for percent motility. Intratechnician coefficients of variation averaged 10.3% for MicroCell counts, 12.5% for hemacytometer counts, and 5.2% for percent motility. The average percent differences between the technicians' values and the central standard for individual specimens were 13.5%, 16.6%, and 11.9% for MicroCell counts, hemacytometer counts, and simple percent motility, respectively. We achieved our goal of maintaining mean intratechnician coefficients of variation and mean percent differences from the standard values of 15% or less for measurements of simple percent motility and sperm concentration by MicroCell. Standardization using the Improved Neubauer hemacytometer chamber proved more difficult. We were not successful in standardizing a method for categorical assessment of individual sperm progression.

Key words: Sperm concentration, semem volume, sperm motility, quality control, observer variation, precision

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