



VALIDATION OF THE “COMPUTER-ASSISTED SPERM ANALYSIS (CASA) SYSTEM” IN THE AUTOMATION OF IN VITRO FERTILIZATION LABORATORIES

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PURPOSE & OBJECTIVES

Sperm concentration and motility are essential parameters for semen analysis which is limited by high measurement uncertainty due to operator subjectivity. A computer-assisted spermatozoa test, the Computer-Assisted Sperm Analysis (CASA) system, has been introduced to reduce variance and standardize semen analysis. The aim of this study is to assess the reliability of the CASA system in evaluating sperm concentration and mobility compared to the World Health Organization (WHO) standard manual analysis in In Vitro Fertilization (IVF) laboratories.

MATERIAL & METHODS

In this retrospective monocentric study, we examined a cohort of 200 samples of semen. Four categories of seminal fluid were examined: normospermic, oligospermic, asthenospermic, oligo-asthenospermic samples. For each sample, the evaluation was performed in succession by the five Senior analyzers and by the computerized system regarding both sperm concentration and motility. Any disparity between the mean values for the two parameters obtained by using the different evaluation methods was assessed. Subsequently, for each sample, a comparison was made by analyzing the diagnosis assigned by each operator and by the software. The data obtained are expressed as mean ± DS (Mean Standard Deviation). Statistical analyses were performed by Windows XP Excel with Student’s t test. Values of p ≤ 0.05 were considered statistically significant.

RESULTS

For both sperm concentration and motility, the mean obtained by all the operators cannot be considered statistically different from that obtained by CASA analysis. In both cases the P-value was > 0,05. Furthermore, the concordant cases (majority of operators in agreement with the diagnosis provided by the system) amounted to 83.5% of all the samples observed, while the remaining 16.5% were discordant cases (the minority of operators agreed with the diagnosis provided by the system).

The CASA system could be used in the same way as the manual method in the evaluation of semen concentration and motility for samples with values distant from the reference ones. While operator-dependent validation is necessary for all those cases with values close to the cut-off in order to confirm or not the diagnosis indicated by the system.

CONCLUSIONS

Findings suggest that the computerized system and the manual method produce similar results, with means that are almost comparable. Moreover, we observed that in all the discordant cases (16.5%), sperm concentration and motility values were approximately in the range of standard values. For this reason, we can observe diagnoses that are “blurred” and partially comparable with the diagnosis obtained by the software. Therefore, findings show a relative disparity between Senior operators and between the ones obtained by the CASA system but are nevertheless always limited to only extreme conditions.

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RESULTS

Video 1. Video obtained from an analysis performed on a semen sample with CASA

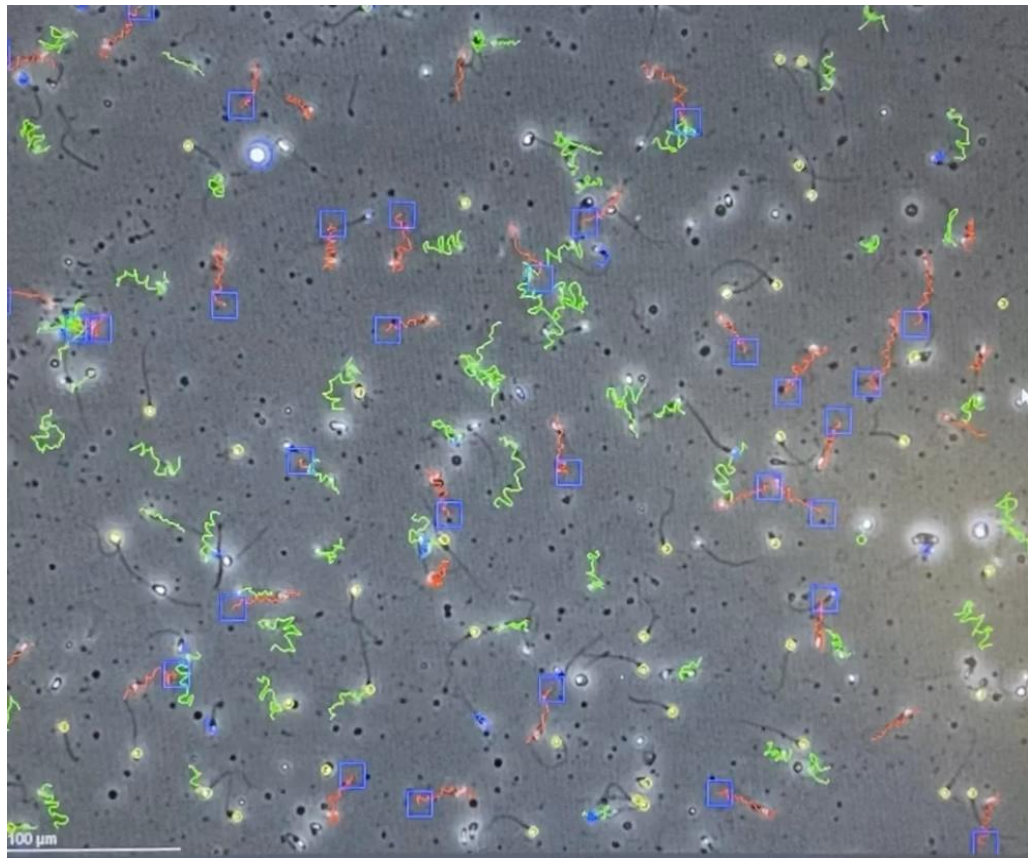


Table 1. Summary table of the results of first analysis carried out in the study

	Manual	CASA	P-value
N° samples	200	200	
Concentration (million/ml)	39,66 41,17	40,18 43,09	0,9
Progressive Motility (%)	37,58 19,25	38,26 20,51	0,73

Figure 1. Summary graph of the results of the second analysis carried out in the study

