An Evaluation Study of a New Sperm Quality Analyzer

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INTRODUCTION

The purpose of this study is to evaluate the performance, reliability and accuracy of the new automated sperm quality analyzer SQA-V (Medical Electronic Systems Ltd., Caesarea, Israel), that combines electro-optical and computing techniques with a flexible and convenient visualization system. The results are compared with conventional microscopic semen examination.

MATERIAL AND METHODS

The clinical study was carried out at the Tel-Hashomer (TH) and Ramat-Marpe (RM) medical centers in Israel. Fresh semen samples of 145 patients attending these clinics were collected and, after liquefaction, aspirated into the SQA-V composite capillaries. These capillaries were then inserted into the electro-optical chamber of the instrument. In this electro-optical system, light beams are transmitted through the samples to photo-detectors that translate their relative parameters into electrical signals. These electrical signals are detected, digitized and transferred to an internal computer for data analysis that applies specially programmed algorithmic formulas. All semen samples were concurrently tested microscopically using calibrated Makler chambers according to WHO'2000 manual recommendations. Spermatozoa concentration, motility, and normal morphology were assessed. Bland-Altman plots and correlation analysis were employed for statistical evaluation of the two methods.

The top of the line Sperm Quality Analyzer-V

Visualization Chamber with Slide Adapter

RESULTS

Using Bland-Altman plots it was found that most SQA-V/microscope ratio data points of the semen variables examined were spread within two standard deviations of their mean value. This mean value varied from 0.89 to 1.08 depending on the semen parameter evaluated. A high level of Pearson correlation was seen between semen concentration measurements made by the microscope and by the SQA-V (r=0.91 and 0.83 in RM and TH, respectively). The estimation of the motility correlation also showed quite high correlation coefficients (r=0.86 in RM and r=0.65 in TH). Normal morphology, evaluated according to strict criteria, displayed lower correlation due to the narrow range
(0-30%). The repeatability of SQA-V in most cases was below 6%, varying from 2% in the high levels to 15% in the low levels, mainly due to the statistical nature of the measured parameters. The built-in video system of the instrument allows smooth variations of optical magnification between x300 and x500 and serves as a useful supplementary tool for visual microscopic control.
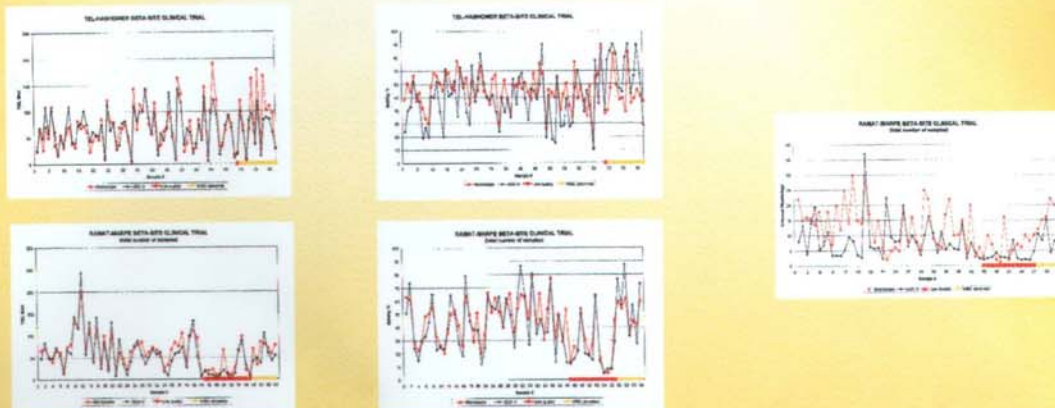
CONCLUSIONS

The SQA-V analyzer demonstrated consistent and reliable performance as well as operating simplicity and compared favorably with manual microscopic evaluation methods.