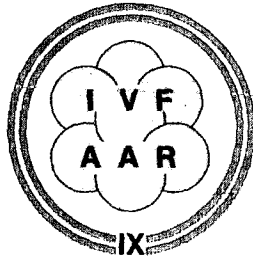


REPRINTED FROM:



WORLD CONGRESS ON IN VITRO FERTILIZATION AND ASSISTED REPRODUCTION

Vienna (Austria), April 3 - 7, 1995

Editors

A. ABURUMIEH, E. BERNAT, G. DOHR,
W. FEICHTINGER, F. FISCHL,
J. HUBER, E. MÜLLER, S. SZALAY,
W. URDL and H. ZECH

MONDUZZI EDITORE

INTERNATIONAL PROCEEDINGS DIVISION

IX

Computer assisted semen analysis better defines male factor in an IVF program than either motile density or strict morphology

B. SHANIS, J.H. CHECK, A. BOLLENDORF
and A. NAZARI

UMDNJ, Robert Wood Johnson Med. School at Camden (USA)

IX World Congress on
IN VITRO
FERTILIZATION and
ALTERNATED
ASSISTED
REPRODUCTION

Vienna, Austria
3-7 April 1995

SUMMARY

In the study presented herein, sperm motility variables and morphology were compared to see if the additional information would be helpful in defining a male factor in patients undergoing in vitro fertilization-embryo transfer (IVF-ET) when determined using computer assisted semen analysis. Semen variables evaluated included curvilinear velocity (Vcl), straight line velocity (Vsl), linearity (Lin), ALH mean and beatcross frequency (BCF).

INTRODUCTION

The Society for Assisted Reproductive Technologies (SART) defines male factor as sperm concentration <20mill/mL and % motility <40%. However, most centers also perform sperm morphology and assess the quality of sperm motility using a computer assisted semen analyzer (CASA) as part of their routine testing.

Since sperm motility is one of the most important semen variables necessary for sperm penetration of the zona pellucida prior to fertilization

of the oocyte disregarding this important variable would lead to classifying these male factor patients as unexplained infertility.

MATERIALS AND METHODS

This study analyzed semen results from couples tested from January 1, 1992 - December 31, 1992 at the Pennsylvania satellite of the Cooper Institute for in vitro fertilization-embryo transfer (IVF-ET) of New Jersey.

Patients were divided into three groups: group 1 - had poor fertilization (<30%) and considered male factor by SART classification (n=5), group 2 - poor fertilization (<30%) and no male factor (n=17), group 3 - good fertilization (>70%) and no male factor (n=32).

Sperm concentration and % motility were performed using Makler counting chambers. Motile density (MD) was calculated as count (mill/mL) x % motility/100.

Table 1 Comparison of Semen Variables According to Fertilization Groups and Male Factor Classification

	Gr 1 - poor fertilization SART male factor (n=5)	Gr 2 - poor fertilization no male factor (n=17)	Gr 3 - good fertilization no male factor (n=32)
Count (x10 ⁶ /mL)	13.8±3.2 ^a	67.4±40.1	85.5±62.9
Motility (%)	24.5±9.9 ^a	43.4±15.0 ^b	57.2±13.7
MD (x10 ⁶ /mL)	3.5±2.1 ^a	32.1±25.3	52.6±47.8
Total motile (x10 ⁶)	12.9±12.2 ^a	70.5±55.4 ^b	153.9±143.0
Normal morphology (%)	3.6±2.7 ^a	10.9±7.1	11.9±10.1
Vcl (microns/s)	40.2±11.6	38.7±8.6 ^b	49.8±13.3
Vsl (microns/s)	24.3±10.2	22.4±6.9 ^b	31.6±9.9
Lin	5.8±1.0	5.7±.77 ^b	6.3±.82
ALH mean (microns)	1.9±.5	2.0±.46	2.4±.7
BCF	14.8±1.7	14.1±1.5 ^b	15.7±.5
FRs (%)	8.8±8.1	8.9±9.0	87.1±11.4
PRs (%)			
SAB			
Ongoing/delivered	0 0	1 0	10 (31.25) 9 (28.13)

^a Gr 1 differs from gr 2 and gr 3; ^b Gr 2 differs from gr 3

CellSoft (Cryo Resources, NY) was used to assess CASA variables: curvilinear velocity (Vcl), straight line velocity (Vsl), linearity (Lin), ALH mean and beatcross frequency (BCF) (1,2).

Sperm morphology was assessed using the strict criteria (3).

RESULTS AND CONCLUSIONS

Only five men out of the 34 evaluated fit the SART classification for male factor and all five also had poor fertilization (<30%).

The mean levels of the semen variables were compared in the three groups. Results showed that groups 1 and 2 had lower % motility and total motile sperm than group 3 (see Table 1).

Groups 1 and 2, both with poor fertilization rates, had similar mean results on all CASA variables and were significantly lower than CASA results from group 3, the group with good fertilization.

Normal morphology was lower in group 1 than in groups 2 and 3.

Motile density and morphology evaluation did not distinguish group 2 with poor fertilization compared to group 3.

When poor fertilization occurs the problem may be related to either a male factor, oocyte factor, or both. SART defines male factor solely on the basis of concentration and % motility. Theoretically, then all patients in group 2 who exceeded the minimum male factor criteria would have predominantly an oocyte factor problem. However, there has been data suggesting that poor strict morphology may predict the male factor; but our data did not find any lower mean strict morphology or even any patients with <4% normal forms in this critical group 2. Yet despite appearing normal there is suspicion that the conclusion that group 2 must consist entirely of oocyte problems is incorrect since the CASA variables matched much more closely group 1 patients and were significantly lower than group 3.

If one is to look for subnormal semen parameters that may further distinguish male factor for IVF purposes, CASA is far superior to strict morphology.

REFERENCES

1. Macleod IC, Irvine DS, Masterton A, Taylor A, Templeton AA. Assessment of the conventional criteria of semen quality by computer-assisted image analysis: evaluation of the Hamilton-Thorn motility analyser in the context of a service andrology laboratory. *Hum Reprod* 9:310-319;1994.
2. Krause W, Schonharl G, Brake A. The viability of measuring sperm concentration and motility as determined by computer assisted image analysis and visual estimation. *Andrologia* 25:181-187;1993.
3. Kruger TF, Acosta AA, Simmons KF, Swanson RJ, Matta JF, Oehninger S. Predictive value of abnormal sperm morphology in vitro fertilization. *Fertil Steril* 49:112-117;1988.

MONDUZZI  EDITORE

VIA FERRARESE, 119/2
40128 BOLOGNA

TEL. (051) 370337 - FAX (051) 370529
TELEX 512654 MONDBO I