# BIOLOGICAL VARIABILITY OF SPERM ANTIBODIES IN SEMEN SAMPLES FROM INFERTILE MEN.

SIMON PHILLIPS[1], CAROLE RHEAUME[1], ABDULAZIZ BAAZEEM[2], ISAAC JACQUES KADOCH[1], ARMAND ZINI[1-2].
[1]OVO FERTILITY, MTL, QC, CND. [2]MCGILL UROLOGY RESEARCH DEPARTMENT, MCGILL UNIVERSITY, MTL, QC. CND.

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## ABSTRACT

**Introduction:** To assess and compare the variability of conventional sperm parameters and sperm antisperm antibodies in repeat semen samples from infertile men.

**Methods:** One hundred and seventy-five (175) non-azoospermic, infertile men submitted two consecutive semen samples, 1 to 2 months apart. Sperm concentration, motility, strict morphology and antisperm antibodies (evaluated by direct mixed agglutination reaction and expressed as the percentage of spermatozoa with IgG antibodies) were evaluated. The within-subject coefficient of variation (CV) between 1st and 2nd samples was estimated for each parameter (CV=SD/average).

**Results:** Mean sperm concentration, progressive motility, strict normal morphology and the percentage of spermatozoa with antisperm antibodies were not significantly different between the first and second semen samples. Sperm head defects showed the lowest average coefficient of variation (CV=3.7%) with all other CVs in the range of 30 – 50%. In that subset of samples with significant ASAs (>40% of spermatozoa with IgG), the CV was 9.3%.

**Conclusions:** Our data indicate that strict assessment of sperm head abnormalities exhibits the lowest within-subject coefficient of variation. In men with positive sperm antisperm antibodies (>40%), the test result is reproducible on repeat assessment (average CV = 9.3%). The data suggest that sperm antisperm antibodies represents a stable biologic marker of sperm function.

## OBJECTIVE

The aim of the study was to compare the variability of sperm parameters and sperm antisperm antibodies (ASAs) in repeat semen samples from infertile men.

## METHODS

A retrospective analysis of data was performed on consecutive semen samples of 175 men presenting for infertility evaluation. Patients produced two semen samples with an interval of one to two months between the samples.

Semen analysis was carried out according to WHO criteria[1]. Direct ASA levels (both IgG and IgA) were measured in semen by MAR test including localization of the binding (head, midpiece, tail).

## STATISTICS

Results are expressed as the result from each analysis with the within-subject standard deviation. The coefficient of variation (CV) was calculated as within-subject standard deviation over each mean and then reported as the mean coefficient of variation for each parameter.

## RESULTS

**Table 1.** Descriptive statistics of standard sperm parameters and IgG ASA levels in first and second samples from infertile men (n=175)

| | $Mean_1$ | $Mean_2$ | $SD_w$ | $CV_w$ |
|---|---|---|---|---|
| **Sperm concentration (M/ml)** | 50.1 | 47.1 | 18.4 | 39.6% |
| **Rapid progressive Sperm motility (%)** | 23.5 | 27.1 | 7.6 | 36.3% |
| **Slow progressive Sperm motility (%)** | 10.3 | 11.0 | 4.6 | 41.3% |
| **Normal Forms – Strict Morphology (%)** | 6.0 | 7.0 | 1.9 | 27.7% |
| **Sperm IgG ASA (%)** | 6.2 | 10.4 | 3.3 | 55.6% |

$SD_W$: Average within-subject standard deviation
$CV_W$: Average within-subject coefficient of variation (CVW= SDW/Mean1&2

**Table 2.** Descriptive statistics of standard sperm parameters and IgG ASAs levels in first and second semen samples from infertile men with positive (>40%) IgG ASA levels (n=10)

| | $Mean_1$ | $Mean_2$ | $SD_w$ | $CV_w$ |
|---|---|---|---|---|
| **Sperm concentration (M/ml)** | 22.6 | 24.5 | 6.1 | 38.4% |
| **Rapid progressive Sperm motility (%)** | 18.7 | 14.7 | 5.4 | 31.8% |
| **Slow progressive Sperm motility (%)** | 9.4 | 13.4 | 4.5 | 38.3% |
| **Normal Forms – Strict Morphology (%)** | 7.4 | 7.5 | 0.9 | 12.9% |
| **Sperm IgG ASA (%)** | 70.2 | 79.6 | 6.7 | 9.3% |

$SD_W$: Average within-subject standard deviation
$CV_W$: Average within-subject coefficient of variation (CVW= SDW/Mean1&2

## CONCLUSIONS

In this study we assessed the biological variability of several standard semen parameters as well as antisperm antibodies. As expected and previously demonstrated in the WHO Manual for the Examination of Human Semen and Sperm-Cervical mucus interaction, semen parameters such as concentration and motility have a high coefficient of variation. In our study these parameters demonstrated a coefficient of variation of at least 35%. (36.3 – 41.3%)

Since only 10 out of 175 men demonstrated positive IgG ASAs (5.7%) the coefficient of variation for ASAs is very high when all patients are considered together. (55%)

However, if the sub-set of positive ASAs patients are analysed apart, although the concentration and motility CVs remain high, the CV for ASAs is particularly low at less than 10%. (9.35%). This suggests that once positive, ASAs remain at a constant level in patients.

Interestingly the CV for normal forms was also lower at 12.9% and it was noted (data not shown) that head defects in particular were extremely constant in terms of the variation between separate semen analyses for the same individuals.

## REFERENCES

1. WHO Manual for the Examination of Human Semen and Sperm-Cervical Mucus Interaction. 4th Edition. Cambridge University Press. 1999.

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