

OP 02

Evaluation of the effectiveness of the glass wool column filtration method in sperm processing

Thilakarathna BS^{*1}, Prathapage MC¹, Wickramaarachchige DAM¹, Losana K¹,
Raguraman S²

¹*Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences, UoJ*

²*Department of Obstetrics and Gynaecology, Faculty of Medicine, UoJ*

^{*}*buddhika.suranjan962@gmail.com*

Introduction: Sperm preparation is essential in Assisted Reproductive Technology (ART) to enrich motile spermatozoa and eliminate contaminants such as white blood cells (WBC). The density gradient centrifugation method is widely used in clinical practice. Glass wool column filtration (GWCF) has been proposed as an alternative that selectively removes immotile sperm and leukocytes while being more cost-effective compared to conventional methods. This study evaluates the effectiveness of GWCF by comparing outcomes with unprocessed semen.

Objective: To evaluate the effectiveness of the GWCF method in sperm processing

Methodology: This laboratory-based cross-sectional study was conducted at the Andrology laboratory, Faculty of Medicine, University of Jaffna. Forty-two leftover semen samples of normozoospermic men were collected within fifteen minutes for processing after obtaining their written informed consent. Sperm concentration, sperm motility, and WBC count were obtained from both unprocessed whole semen and processed semen using the GWCF method. Paired t-test and Wilcoxon signed-rank test were applied to compare mean values of the parameters before and after processing. Data analysis was performed using SPSS version 27.

Results: Sperm concentration was decreased significantly from 95.95 ± 64.46 million/ml (Mean $\pm$ SD) in unprocessed semen to 7.52 ± 7.67 million/ml following the GWCF method ($p < 0.001$). In contrast, sperm motility was increased significantly, rising from $61.61 \pm 17.31\%$ in unprocessed semen to $72.65 \pm 17.30\%$ following the GWCF method ($p < 0.001$). WBC count showed a significant reduction, dropping from 4.48 ± 2.99 cells/HPF in unprocessed semen to 1.01 ± 0.89 cells/HPF following the GWCF method ($p < 0.001$). Overall, the GWCF method yielded samples with reduced sperm concentration, improved motility, and lower WBC counts compared to unprocessed semen.

Conclusions: The GWCF method enhances sperm motility and reduces WBC contamination while resulting in a lower sperm concentration. This method demonstrates potential for enhancing sperm quality after processing for ART, while representing a cost-effective alternative to conventional techniques. Assessment of additional parameters, such as sperm vitality and morphology, would further strengthen the confirmation of semen quality outcomes.

Keywords: Assisted Reproductive Technology (ART), Glass wool column filtration, Sperm processing, Sperm motility, Sperm concentration