Effect of microsurgical varicocelectomy on sperm DNA integrity and association with reproductive outcomes of IVF/ICSI

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Background
• Varicocele is present in 15-20% of the general male population, with an increased prevalence of up to 40% in infertile men1.
• Men with clinical varicocele have been shown to have elevated levels of sperm DNA fragmentation (DFI), which is associated with adverse reproductive outcomes2,3.

Research Objectives
• Examine the effect of microsurgical subinguinal varicocelectomy (VR) on sperm DFI assessed by TUNEL assay and/or sperm chromatin structure assay (SCSA)
• Correlate these data with pregnancy rates and live birth outcomes via IVF/ICSI
• Sperm DFI was assessed by TUNEL and/or SCSA assay and compared with IVF/ICSI outcomes.
• Comparisons assessed with t-test and McNemar’s test.

Methods

Results

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Comparison of sperm DFI changes following VR between pregnant and non-pregnant groups (all receiving postoperative IVF)

Postoperative pregnancy outcomes
• Of the 78 men, 35 couples received postoperative IVF at this institution.
• Pregnancy rate was 71% (25/35) and live birth rate 40% (14/35)
  • Total IVF cycles: 73
  • Failed cycles: 35/73
  • Total pregnancies: 38/73
  • 11 couples conceived naturally postop, with a live birth rate of 9/11. 32 men were lost to follow-up.
  • Pregnancy rates were improved in men whose DFI moved from abnormal to normal postop (defined as <7% for TUNEL and <30% for SCSA)

Conclusions
• Treatment of varicocele using microsurgical subinguinal VR technique significantly improves sperm DFI as measured by TUNEL and SCSA.
• Improvements in TUNEL following VR are associated with improved pregnancy outcomes using IVF/ICSI.
• There is evidence suggesting elevated sperm DFI results in less successful pregnancy outcomes. The present study suggests that lowering sperm DFI via VR may result in improved reproductive outcomes.

References