

Expression of Synaptonemal Complex Protein 3 (SYCP3) mRNA in the testis: a molecular marker for spermatogenesis in azoospermic men

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Abstract

Introduction: Men with unexplained infertility and azoospermia are often observed in the context of genetic defects. The expression of a wide variety of genes is developmentally regulated during human meiosis. Synaptonemal Protein 3 (SYCP3) gene, located on chromosome 12, encodes a DNA-binding protein as the structural component of the synaptonemal complex, which mediates the synopsis or homologous pairing of chromosomes during meiosis. Absence of SYCP3 in mice may lead to male infertility as well as female sub-fertility. SYCP3 expression analysis could be a tool for the prediction of human spermatogenesis progression, especially in infertile men.

Materials & Methods: SYCP3 mRNA expression in testicular samples of 110 patients with non-obstructive azoospermia were studied in Avesina Infertility Clinic in Tehran, Iran during 2005 and early 2006. Semi-quantitative nested reverse transcriptase-PCR was employed in order to find the strength of gene expression. Using histopathological scoring for all samples, the expression level of SYCP3 during spermatogenesis was also evaluated.

Results: Testicular SYCP3 mRNA expression was observed in 67 patients (60.9%). The expression level correlated with the degree of spermatogenic failure ($p < 0.0001$). While this gene had been expressed in patients with hypo-spermatogenesis and maturation arrest, a lack of expression was seen in those with spermatogonial arrest, Sertoli cell-only syndrome and testicular atrophy.

Conclusion: These data indicate that SYCP3 is expressed in the human testis and it is restricted to germ cells. Our findings, in association with those obtained in experimental animals, show that lack of SYCP3 expression may have negative effects on spermatogenesis and male fertility. SYCP3 gene expression may help detect specific spermatogenesis stages in conjunction with histopathological findings.

Key Words: Male infertility, Spermatogenesis, Synaptonemal Complex Protein 3, Testicular biopsy, Azoospermia.

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