

Ultrastructural Analysis of Abnormal Spermatozoa in Fertile Men

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Several studies have revealed a decline in human sperm concentration over the past 50 years and an increase in sperm abnormalities. To evaluate the sperm quality of fertile men, sperm morphology was examined using light and electron microscopes. Semen samples of 22 partners of pregnant women were collected using the protocol standardized by an international collaborative study. Thin sections were double stained and observed under a JEOL 1200A electron microscope. To investigate the whole spermatozoa, semen was deposited onto carbon-film-coated copper grids and stained negatively with a drop of 1 % uranyl acetate.

Almost all anomalies observed in infertile patients were found in the fertile men, although semen of the fertile men contained a lower percentage of anomalies than that of infertile patients. According to W. H. O. criteria (2001), abnormal spermatozoa of the fertile men were classified into 13 types: six for head, four for the middle piece, and three for the tail. We also found severe amorphous abnormal spermatozoa that hardly classified into these types. For example, one flagellum surrounded three amorphous nuclei linked together by one acrosome: two nuclei that are normally shaped shared one flagellum; one immature nucleus was accompanied by two flagella. These observations imply that multiple dysplasia may be occurred by whimsical orientation among during acrosome formation, nuclear shaping, or flagellar organization in spermiogenesis. A detailed study on sperm abnormalities is necessary to detect the influence of environmental chemicals.