Introduction

Diabetes mellitus type 1 (DM1) affects an increasing number of young men in reproductive age. Its prevalence increases at a rate of ~3% per annum. DM1 may affect male reproductive function by acting on the hypothalamic-pituitary-testicular axis, causing sexual dysfunction and disrupting male accessory gland function. A recent study shows that men with DM1 have a smaller number of live births than controls. Little is known about sperm parameters and other aspects of the male reproductive function in these patients.

Aim: to evaluate both conventional and non-conventional sperm parameters, serum gonadal hormones and didymo-epididymal ultrasound features in patients with DM1.

Methods

We enrolled:

- 30 patients with DM1 (aged 18-35 years)
- 20 age-matched fertile healthy men and classified according to disease duration (<5, 5-10, >10 years)

Exclusion criteria: patients with diabetic neuropathy, other endocrine disorders or conditions known to alter sperm parameters

The following parameters were assessed:

- conventional sperm parameters (WHO 2010 criteria);
- non conventional sperm parameters (mitochondrial membrane potential, degree of viability and/or apoptosis, sperm DNA fragmentation) by flow cytometry;
- serum total testosterone, 17β-estradiol, LH, FSH and PRL
- testicular and epididymal morphometry by ultrasound scan before and after ejaculation.

Results

- DM1 patients had a significantly lower percentage of sperm progressive motility than controls: this abnormality was significantly lower in DM1 patients with long (>10 years) than short (<5 years) disease duration
- The alterations on non-conventional sperm parameters are shown in Figure 1A and 1B
- Patients with DM1 compared to controls and those with long disease duration had a significantly higher cephalic and caudal epididymal diameters after ejaculation
- All the other parameters did not show any statistically significant difference

Conclusions

In conclusion, patients with DM1 had lower sperm progressive motility because of impaired mitochondrial function and epididymal post-ejaculatory dysfunction which cannot be ascribed to endocrinopathy and/or neuropathy. These findings may explain some fertility disorders in DM1 patients.