



Relationship between diabetes mellitus type 1 and male reproductive function

Sandro La Vignera, Rosita A. Condorelli, Aldo E. Calogero

Department of Clinical and Experimental Medicine, University of Catania, Catania, Italy

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

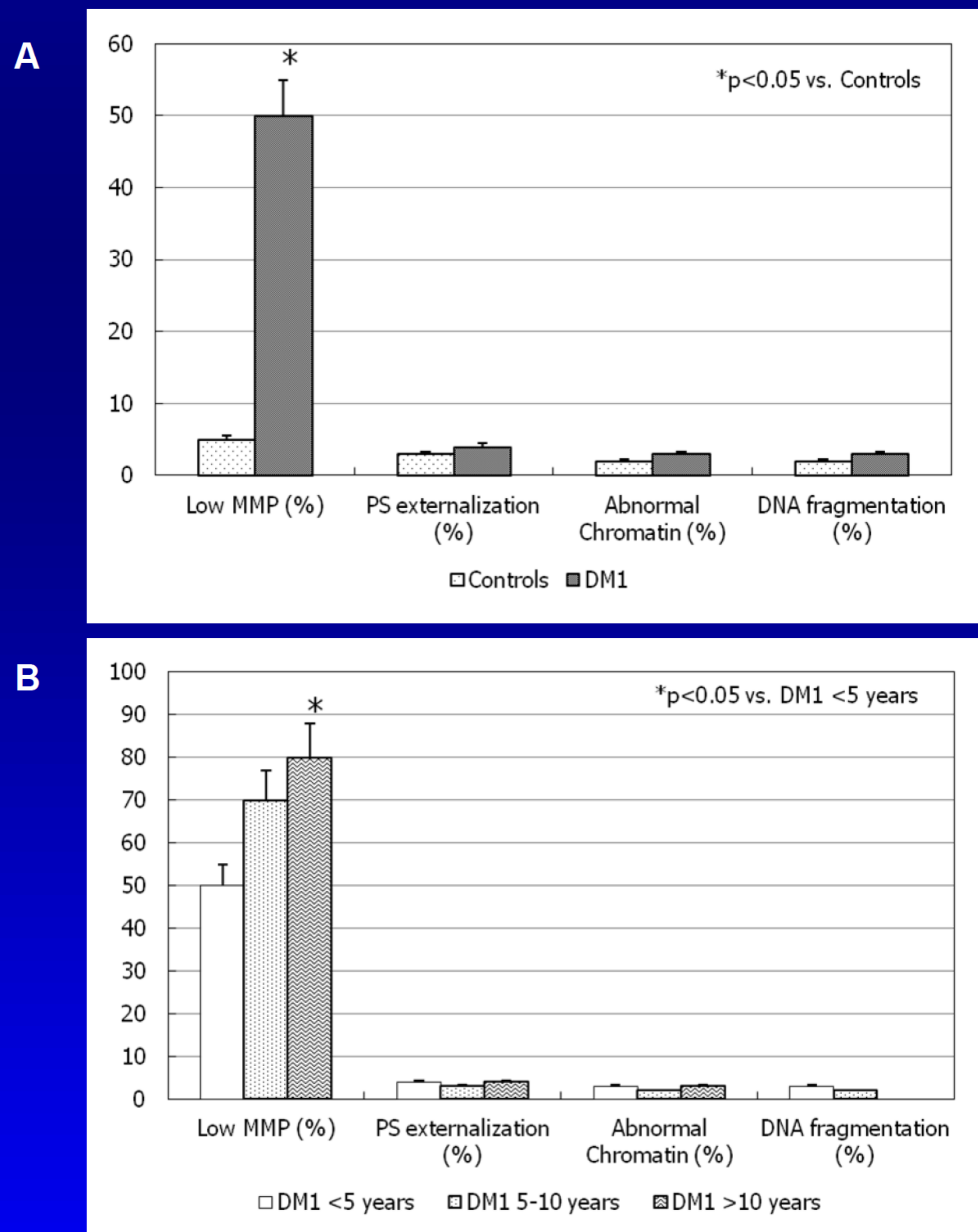
The following parameters were assessed:

- 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

Fig 1. Non conventional sperm parameters in patients with DM1 and controls (A) and classified according to disease duration (B)



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.

