Fertile®Chip-ZyMōt improves ICSI clinical outcomes in patients with high values of sperm double-strand breaks using oocytes from both patients and donors

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Introduction

Altered values of **double-strand sperm DNA fragmentation** (dsSDF), measured thought the **neutral CometFertility** assay, have been associated to a delay in embryos kinetics, to implantation failures in ICSI treatments and recurrent miscarriage. Other studies show that dsSDF could be present in the sperm subpopulation selected for ICSI, while single-strand sperm DNA fragmentation (ssSDF) would be significantly reduced due to the selection of a motile sperm.

New methods for sperm selection based on microfluidic properties such as the **Fertile®Chip** have been developed recently. This device is able to reduce the presence of ssSDF and dsSDF in the sperm sample. In this sense, the specific reduction of dsSDF using Fertile®Chip could improve clinical outcomes after ICSI treatments.

Objective

To determine the effect of Fertile®Chip as a sperm selection method in ICSI treatments in patients with altered values of dsSDF.

Materials and methods

In this study 78 ICSI cycles recruited at the Ginefiv clinic (Madrid, Spain) were classified in 3 groups (Table 1).

Sperm DNA fragmentation was analyzed through the CometFertility assay (CIMAB, Barcelona, Spain) to differentiate between ssSDF and dsSDF. Only patients with altered values of dsSDF were included. Sperm selection was performed using the Fertile®Chip (DxNow, Maryland, USA) (Figure 1). The UNStat4 software was used for statistical analysis using α value as 0.05.

Results

	CONTROL	GROUP 1	GROUP 2
N	28	34	16
Sperm selection method	Density grandients	Fertile® Chip	Fertile® Chip
Oocytes origin	Patients	Patients	Donors
Age of the oocytes donors	35.67 ± 3.43	36.17 ± 3.84	26.7 ± 4.28
Embryo transferences nº	16	22	11
Fecundation rate (%)	0.51 ± 0.29	0.53 ± 0.27	0.63 ± 0.21
Biochemical pregnancy / transfer	3 (18.8%)	12 (54.5%)	7 (63.6%)
Clinical pregnancy / transfer	2 (12.5%)	10 (45.5%)	7 (63.6%)
Miscarriage / clinical pregnancy	2 (100%)	2 (20%)	0 (0%)

Table 1. *Studied groups and clinical outcomes obtained.*

Conclusions

The use of Fertile®Chip improved biochemical and clinical pregnancy rates and reduced miscarriage rate in ICSI cycles from patients with altered values of dsSDF. Even so, fecundation rate was no statistically different.

Figure 1. *Microfluidic device (Fertile®Chip).*