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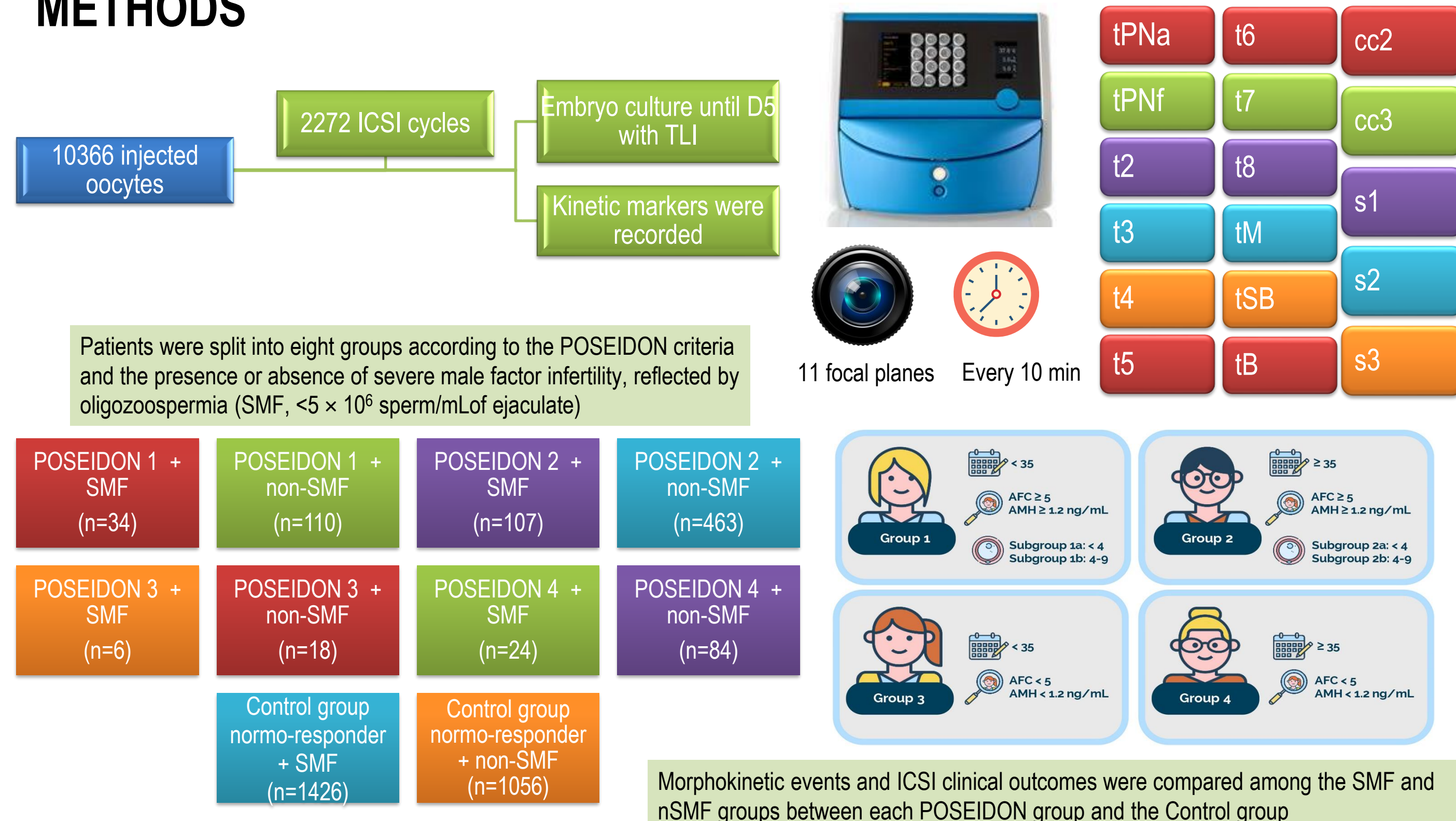
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INTRODUCTION

It has been reported that 37.1% of poor responder patients (POR) have infertile male partners. While the maternal influence has been well-investigated, the role of seminal quality on reproductive outcomes in POR remains questionable. Embryo monitoring with timelapse imaging (TLI) may be a valuable approach to evaluate whether sperm quality relates to association between POSEIDON classification and the competences of developing embryos. The aim of this study was to investigate whether severe male factor (SMF) impacts embryo quality and morphokinetic behavior in the four groups of low-prognosis women as stratified by the POSEIDON criteria.

METHODS



RESULTS

POSEIDON group 1 embryos showed significantly slower development compared to those from Control group, irrespective of sperm quality. Fertilization rates and blastocyst development rates were higher in nSMF subgroups compared to SMF subgroups in both POSEIDON 1 and Control groups.

Embryos in POSEIDON 2 SMF subgroup took longer than those in POSEIDON 2 nSMF subgroup, and those in both Control subgroups, to achieve several milestones. Fertilization rates were significantly higher in nSMF groups compared to SMF groups in both POSEIDON 2 and Control groups. Blastocyst development rates were significantly higher in nSMF subgroups compared to SMF subgroups in both POSEIDON 2 and Control groups. Implantation and miscarriage rates were significantly improved in Control subgroups compared to POSEIDON 2 subgroups.

The slowest t2 mean was observed in POSEIDON 3 SMF subgroup, which was significantly different from all other subgroups. Embryos in POSEIDON 3 SMF subgroup took longer than those in Control SMF subgroup to achieve tM. Fertilization rates were significantly higher in nSMF subgroups compared to SMF subgroups in both POSEIDON 3 and Control groups.

Embryos derived from patients in the POSEIDON group 4 showed significantly slower development compared to those from Control group, irrespective of sperm quality. Embryos in POSEIDON 4 SMF subgroup took longer than those in POSEIDON 4 nSMF subgroup to achieve s1. Fertilization rate was significantly higher in nSMF subgroups compared to SMF subgroups in both POSEIDON 4 and Control groups. Blastocyst development rates were significantly different across the subgroups. Pregnancy, implantation and miscarriage rates were significantly improved in Control subgroups compared to POSEIDON 4 subgroups.

Groups	POSEIDON		Control group		p-value
	SMF	nSMF	SMF	nSMF	
POSEIDON 1	4.32 ± 0.15 ^a	4.68 ± 0.12 ^{bc}	4.59 ± 0.07 ^{ab}	4.95 ± 0.04 ^c	<0.001
POSEIDON 2	4.34 ± 0.09 ^a	4.61 ± 0.07 ^{bc}	4.59 ± 0.07 ^c	4.95 ± 0.04 ^d	<0.001
POSEIDON 3	2.54 ± 0.42 ^a	2.86 ± 0.41 ^b	4.59 ± 0.07 ^c	4.95 ± 0.04 ^d	<0.001
POSEIDON 4	4.23 ± 0.19 ^a	4.56 ± 0.17 ^{bc}	4.59 ± 0.07 ^{ac}	4.95 ± 0.04 ^b	<0.001

Table 1. KIDScore ranking comparison among POSEIDON and Control groups, according to the presence or absence of SMF

CONCLUSIONS

Embryos from SMF patients showed lower KIDScore ranking than those from non-SMF (nSMF) patients, which may justify the reduced clinical outcomes contrasted to Control group. Embryo quality, as assessed by TLI-imaging, and clinical outcomes were significantly lower in POSEIDON SMF patients, suggesting that both oocyte (quantity and quality) and sperm are determinant of embryo development.