



O-60 Monday, October 8, 2018 12:00 PM

TOTAL MOTILE SPERM COUNT TREND OVER TIME ACROSS TWO CONTINENTS: EVALUATION OF SEMEN ANALYSES FROM 119,972 INFERTILE MEN.

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OBJECTIVE: While previous reports of declining sperm counts in the fertile and unselected population are concerning, the most reliable indicator of male fertility, the total motile sperm count (TMSC), has not been previously evaluated (1,2). Furthermore, the TMSC trend in the subfertile population remains unknown. We sought to characterize the TMSC trend over time in a large sample of men from infertile couples in two large fertility centers on separate continents to determine if TMSC was declining over time.

DESIGN: Retrospective cohort

MATERIALS AND METHODS: The first semen analysis (SA) of male patients from Reproductive Medicine Associates of New Jersey (RMANJ) and Instituto Valenciano de Infertilidad (IVI) were identified; SAs from 2002-2017 and 2011-2017, respectively, were included due to robust sample size ($n > 2000$). SAs were excluded if collected retrograde, post-vasectomy, or if TMSC not available. SAs were categorized into 3 clinically relevant groups based on treatment strategy: TMSC > 15 million (M) (Group 1), TMSC 5-15M (Group 2), and TMSC 0-5M (Group 3). Linear and logistic regression were used where appropriate to assess the impact of age and estimate TMSC group as a function of collection year.

RESULTS: A total of 41809 SAs from RMANJ and 78163 from IVI (129 countries of origin; 74% Spanish) were included. Analyses were performed on RMANJ and IVI data separately. In the RMANJ cohort, linear regression demonstrated TMSC decreased by 1.8% per year in Group 1 ($p = 2.2 \times 10^{-16}$), and the odds of belonging to Group 1 decreased over time (OR ≈ 0.979 ; 95% CI $\approx 0.974 - 0.985$; $p = 2.8 \times 10^{-14}$). Age was associated with TMSC in Group 1: For every 1 yr increase in age, TMSC decreased by 1.1% ($p = 2.2 \times 10^{-16}$), and the odds of belonging to Group 1 decreased with age (OR ≈ 0.977 ; 95% CI $\approx 0.973 - 0.981$; $p = 2.2 \times 10^{-16}$). Similar trends in groups were found in the IVI cohort.

CONCLUSIONS: Although TMSC was found to marginally decrease over time, the clinical significance of this finding is unclear. This trend may reflect a selection bias, in that more infertile men are presenting for treatment each year, or adverse effects of environmental factors. Whatever the underlying etiology, the shift in groups over time is clinically relevant, as treatment strategies differ by categorization. Longer follow up is necessary to confirm TMSC trends in the infertile population.

References:

1. Levine H et al. Temporal trends in sperm count: a systematic review and meta-regression analysis. *HRU* 2017; 23(6):646-59.
2. Hamilton JA et al. Total motile sperm count: a better indicator for the severity of male factor infertility than the WHO classification system. *Hum Reprod* 2015;30:1110-21.

Supported by: N/a