linear was also used to analyze the association of azzospermia related clinical parameters with the TLT.

RESULTS: The mean LTL of NOA patients was significantly shorter than the controls (healthy and OA patients) (0.778±0.016 vs 0.902±0.017; $P < 0.001$). The LTL was negatively associated with patient age in OA (r_p=-0.150, $P = 0.018$) and healthy goups (r_p=-0.137, $P = 0.025$) while no association was found between them in NOA patients. The patients with shorter telomere length (lowest tertile) had significantly higher risk of NOA than individuals with longer telomeres (middle and highest tertile). Interestingly, we also found that the LTL was positively associated with the activity of spermatogenesis demonstrated by Jackson score determined by testis biopsy and HE staining in the patients with azzospermia after adjusted for patient's age (r_p=0.321, $P = 0.002$).

CONCLUSIONS: These findings in this study provide evidence for the link between short telomere length and defect spermatogenesis in humans, help shed light on an important biological pathway underlying the etiology of male infertility.

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REVISITING ANEUPLOIDY CHARACTERISTICS OF SURGICALLY RETRIEVED SPERMATOZOA BY DNA SEQUENCING (NGS). S. Cheung, P. Xie, Z. Rosenwaks, G. D. Palermo. Reproductive Medicine, Weill Cornell Medicine, New York, NY.

OBJECTIVE: To challenge the notion that sampling epididymal and testicular tissues yields spermatozoa with higher incidence of aneuploidy than those retrieved in the ejaculate.

DESIGN: Nine chromosome FISH was carried out on 2 donor controls, the ejaculates of 67 men, and surgical specimens of 6 azoospermic men. DNA sequencing technology was carried out on the ejaculates and surgical samples of 20 men. A combined assessment was performed on non-azoospermic men with high DNA fragmentation in their ejaculate. ICSI pregnancy outcome was also analyzed and compared.

MATERIALS AND METHODS: Consenting men treated for infertility provided their specimens. FISH was performed on at least 1000 spermatozoa with a threshold of >1.6% with 2-3% FISH error. DNA was extracted and amplified from a comparable number of spermatozoa by PCR-based random hexamer amplification (average DNA concentration 610±102ng/ul and quality of 1.7±0.1nm). By NGS, duplications and deletions by Copy Number Variants (CNVs) were then calculated for all chromosomes by CASAVA and VarScan2 software programs.

RESULTS: A total of 67 couples were included in our study (maternal age 35.8±4yrs and paternal age 39.4±8yrs). Aneuploidy by FISH yielded 0.9% for the donor control but rose in the study group to 3.6% in the ejaculated, 1.2% for the epididymal, and 1.1% for testicular spermatozoa. There were no differences in autosomal or gonosomal disomies, nor nullisomies. In this group, the ejaculated spermatozoa yielded 22% clinical pregnancy rate and 50% with the surgically retrieved specimens.

NGS yielded 1.2% for the control while in the study was 11.1% for the ejaculated specimen and decreased to 1.8% in the epididymal and 1.5% for the testicular (P<0.0001). The pregnancy rate for the ejaculated specimen was 47.2% and 50% for the surgically retrieved.

Simultaneous aneuploidy assessment on the ejaculated and testicular samples in the same individual evidenced a sperm chromatin fragmentation (SCF) of 20% in the ejaculate while on the testicular spermatozoa was only 8%. The pregnancy rate was 0% with ejaculated while 100% with the testicular spermatozoa. Aneuploidy assessment by FISH evidenced 2.8% in the ejaculated and 1.2% in testicular biopsy while with NGS became 8.4% and 1.3% in testicular biopsy (P=0.02), respectively.

CONCLUSIONS: This study challenges the dogma that testicular spermatozoa conceal a higher proportion of aneuploidy. This implies that testicular gametes do not contribute to chromosomally related pregnancy losses. Moreover, this may explain why offspring from testicular biopsy do not evidence higher autosomal or gonosomal aneuploidy than those resulting from ejaculated spermatozoa.

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GENETIC OUTCOMES OF CONCEPTION IN MEN WITH ELEVATED SPERM ANEUPLOIDY. T. P. Kohn[a], A. W. Pastuszak.[b] [a]Baylor College of Medicine, Houston, TX; [b]Scott Department of Urology, Baylor College of Medicine, Houston, TX.

OBJECTIVE: Sperm aneuploidy can be assessed using fluorescent *in situ* hybridization (FISH) and is associated with recurrent spontaneous abortion (SAB) and implantation failure. Here, we examine the relationship between elevated sperm aneuploidy on sperm FISH testing, and genetic abnormalities identified during PGS, SAB, amniocentesis, and in live births.

DESIGN: Retrospective cohort study.

MATERIALS AND METHODS: We identified men who had previously undergone sperm FISH testing in a single academic andrology clinic. Sperm FISH examines sperm disomy, sex chromosome disomy, and aneuploidy in autosomes 13, 18, or 21, and the sex chromosomes X and Y. Chart review and telephone survey was performed to determine genetic outcomes of conceptions of men who had sperm FISH testing. The survey inquired about any PGS results, karyotype results for SABs or amniocenteses, about the general health of offspring, and whether any offspring had trisomy 13, 18, or 21.

RESULTS: We interviewed 99 couples; 46 couples had 173 genetic evaluations performed for a product of conception. Nine couples provided PGS results for 97 embryos (mean(SD) female age 30.0 (6.0) years) of which 57.8% were abnormal. In published literature, the female age-matched rates of embryo aneuploidy are 35.2%. Of the 56 abnormal embryos (57.8%); 44.2% had monosomy, 29.5% trisomy, 11.5% tetraploidy, 3.3% chromosomal region duplications, and 11.5% were burst embryos. Fifteen couples had karyotype analysis of the conceptus after SAB, with 2 reporting a normal karyotype, 4 reporting trisomy 21, and 9 with karyotype findings that were incompatible with life. Miscarriages occurred at a mean of 7.2(2.9) weeks of gestation. Fewer chromosomal abnormalities were observed in pregnancies continuing beyond 15 weeks; all 6 amniocenteses performed were normal. Within our cohort, 52 live births were reported. Only one child had a genetic abnormality, having trisomy 21. Maternal age at conception was 25 years. No deaths or significant health issues were reported for any live births.

CONCLUSIONS: Abnormal sperm aneuploidy conveys an increased risk for abnormal embryos when compared to female age-matched controls. Within this cohort, mainly normal embryos resulted in live births. Thus, couples with abnormal sperm FISH results should be counseled on the high rate of potentially abnormal embryos.

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