A Comparison of Semen Parameters and IVF Outcomes in Male Carriers of Balanced Reciprocal Translocations

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Introduction

It has been reported that male carriers of balanced reciprocal translocations have a higher prevalence of oligozoospermia compared to non-translocation carrier patients. However, there is limited information on the outcomes of IVF and preimplantation genetic testing for structural rearrangement (PGT-SR) using sperm from these carriers. This study examined the relationship between semen parameters and IVF outcomes in male translocation carriers.

Methods

Following the guidelines established by the Japan Society of Obstetrics and Gynecology, we analyzed 41 PGT-SR cycles in 21 cases conducted between 2016 and 2024. The translocation carriers were classified into reciprocal translocation carriers (Rec-C) and Robertsonian translocation carriers (Rob-C), and the proportion of normal semen parameters (defined as ≥15 million sperm/mL) was compared between these groups. Additionally, the Rec-C group was further divided into a normal semen parameter group (Rec-C/N, 13 cases) and an oligozoospermia group (Rec-C/O, 6 cases), along with the Rob-R group (2 cases), to compare fertilization rate, blastocyst rate, and morphologically good blastocyst rate (3BB more than) across the groups. Furthermore, the proportion of chromosomally transferable blastocysts was compared among these three groups.

Results

The proportion of cases with normal semen parameters was 31.6% in the Rec-C group, compared to 0.0% in the Rob-R group. While there was no significant difference in fertilization rates among the Rec-N, Rec-O, and Rob-R groups, both the blastocyst rate and the morphologically good blastocyst rate were lower in the Rec-O group (Rec-N group: 72.7%, 31.8%; Rec-O group: 36.8%, 8.8%; Rob-C group: 70.8%, 20.8%). Additionally, the chromosomally transferable blastocysts rate was higher in the Rob-C group compared to the Rec-N and Rec-O groups (20.8% vs. 36.4% vs. 62.5%).

Conclusions

This study demonstrates that oligozoospermia is more common Rob-C group than Rec-C group, a finding that aligns with previous reports. Although IVF outcomes were lower in the Rec-O group, the Rob-C group did not show significant declines and achieved outcomes comparable to the Rec-N group. Notably, the chromosomally transferable blastocyst rate was higher in the Rob-C group, regardless of semen parameters. These findings suggest that, similar to non-translocation carriers, IVF outcomes may be lower for Rec-C carriers with oligozoospermia.