



Semen quality in patients with hematologic malignancies: a retrospective monocentric study

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Introduction

The hypothalamic-pituitary-testis axis is dysregulated in patients with hematological malignancies. However, data regarding the association between different types of hematological malignancies and semen quality are discordant. While in patients with leukemias a clear deterioration of semen quality is observed, studies on Hodgkin and non-Hodgkin lymphomas have shown that spermatogenesis is not always compromised, and affected patients may present normospermia before treatment.

Aims

The aim of the present study was to assess semen parameters in males affected by hematological malignancies and compare them with a non-cancer population. A retrospective monocentric study was conducted, including patients with hematological malignancies who underwent fertility preservation, at the Maternal and Child Department, Gynecology and Obstetrics, Oncofertility Unit, Federico II University of Naples, from January 2017 to December 2024. A total of 248 patients affected by hematological malignancies and 63 non-cancer males, who underwent in vitro fertilization for female tubal factor selected as the control group, were included. Semen parameters were also compared among the subgroups of Hodgkin Lymphoma (HL), Non-Hodgkin Lymphoma (NHL), and Leukemia (L).

Results

Semen analysis, according to World Health Organization 2021 criteria, showed that the semen parameters of patients with hematological malignancies were at the 25th percentile, except for motility, which was below the 5th percentile. Results showed significant differences in sperm concentration/mL, total sperm number, % of total motility between hematologic malignancies group and control group ($p=0.0004$; $p=0.0003$; $p<0.0001$). Moreover, based on different classification, hematologic malignancies were grouped in 159 Hodgkin lymphoma, 54 non-Hodgkin lymphoma and 35 leukemia and significant differences were found in concentration/mL and total sperm number only between Hodgkin lymphoma and control group ($p=0.004$; $p=0.001$). Instead, the % of total motility appeared statistically significant decreased in all subtypes of hematologic malignancies vs control especially in Leukemia group (HL $p=0.001$; NHL $p=0.006$, L $p<0.001$).

Conclusion

The presented data it has been demonstrated a negative effect of hematological malignancies in semen quality, particularly motility. These results underscore the importance of early fertility preservation strategies in clinical practice and highlight the need for further research to better understand the underlying mechanisms and optimize reproductive outcomes for affected individuals.

Recommended reading

- Shankara-Narayana N, Di Pierro I, Fennell C, et al. Sperm cryopreservation prior to gonadotoxic treatment: experience of a single academic centre over 4 decades. *Hum Reprod.* 2019;34(5):795-803.
- Vomstein K, Reiser E, Pinggera GM, et al. Sperm banking before gonadotoxic treatment: is it worth the effort? *Asian J Androl.* 2021;23(5)