

# GYNECOLOGY AND OBSTETRICS

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## Possible association between *in vitro* fertilization technologies and offspring neoplasm

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**Objective:** To investigate the relationship between fertility treatments, the course of therapy, and the risk of neoplasm in offspring up to age 18.

**Design:** A retrospective cohort study based on the population.

**Setting:** The sole tertiary medical facility and *in vitro* fertilization (IVF) unit in southern Israel, Soroka University Medical Center (SUMC).

**Patients:** All children born at the SUMC between 1995 and 2018 following IVF treatment (the exposed group), as well as those conceived naturally (the unexposed group). The study was carried out at the SUMC, the only tertiary medical facility and IVF unit in southern Israel.

**Intervention(s):** The SUMC, the only tertiary medical facility and IVF unit in southern Israel, was the site of the study. Based on the mother's age and the month of delivery, the exposed and unexposed were matched 1:4. The couple's medical histories, information about the delivery, and diagnoses of children's neoplasms were all included in the data collection. Offspring neoplasm of any kind and delay to diagnosis in each group are the primary outcome measures.

**Result(s):** The study comprised a total of 1,583 exposed and 5,874 offspring. The rates of benign neoplasm in the offspring of the IVF and spontaneous groups were 14 (0.9 percent) versus 21 (0.4 percent), and the incidences of malignancies were 17 (1.1 percent) versus 29 (0.5 percent), respectively. After correcting for covariates, such as mode of delivery and pregnancy problems such as hypertension, gestational diabetes, and premature delivery in comparison to naturally conceived offspring, the link between method of conception and

offspring neoplasm risk remained significant. Children who were transferred as fresh embryos, at an earlier stage of development (cleavage stage), or after three or more aspirated oocytes were more likely to develop neoplasms within the IVF group. The risk was higher among offspring who were returned as fresh embryos, at an earlier embryonic stage (cleavage stage), or after three or more aspirated oocytes.

**Conclusion:** IVF treatment is related with an increased risk of neoplasm in offspring.

### Recent Publications:

1. Bal MH, Harlev A, Sergienko R, Levitas E, Har-Vardi I, Zeadna A, Mark-Reich A, Becker H, Ben-David N, Naggan L, Wainstock T. Possible association between *in vitro* fertilization technologies and offspring neoplasm. *Fertil Steril.* 2021 Jul;116(1):105-113. doi: 10.1016/j.fertnstert.2020.12.013. Epub 2021 Feb 14. PMID: 33597091.
2. Tsumi E, Lavy Y, Sheiner E, Barrett C, Harlev A, Hagbi Bal M, Wainstock T. Assisted reproductive technology and long-term ophthalmic morbidity of the offspring. *J Dev Orig Health Dis.* 2021 Aug;12(4):627-631. doi: 10.1017/S2040174420000938. Epub 2020 Nov 20. PMID: 33213597.

### Biography

Maayan Hagbi Bal has completed her MD-MPH at the age of 27 years from BGU, Israel. She is now a PhD candidate researching Recurrent Preterm Birth, Risk Association with Environmental and Genetic Factors in the Epidemiology department at BGU. The role of the MD-PhD MPH is neither being a clinician nor an epidemiologist, but rather to bridge between the two professions whilst gaining expertise in public health administration. The ability to combine clinical knowledge, experience and skills with experience in scientific questioning, methodology and applications allows for a more holistic clinical and research-based approach to patients.

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