ORIGINAL ARTICLE: ASSISTED REPRODUCTION

# Assisted reproduction policies in Israel: a retrospective analysis of in vitro fertilization–embryo transfer

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**Objective:** To analyze whether the results and effectiveness of the open-ended treatment with IVF in Israel justifies the policy of limitless nondonor IVF rounds.
**Design:** The research sample included 535 patients. The files of these patients were reviewed; data were extracted into a questionnaire, transferred into digital files, and analyzed with SPSS.
**Setting:** IVF clinics located in two large regional hospitals in Israel.
**Patient(s):** Two hundred ten women who began IVF treatment in 2000 and 325 women who were in IVF treatment during 2010.
**Intervention(s):** None.
**Main Outcome Measure(s):** Retrospective analysis of the success rates of live births resulting from cycles with IVF in women who started treatment in 2000, retrospective analysis of IVF results during 2010, and number of cycles in women who were in IVF treatment during 2010.
**Result(s):** In the 2000 cohort, the rate of success with IVF was 54%. The success rate fell as the number of unsuccessful cycles and duration of infertility increased; age at the beginning of the treatment was influential. A similar pattern appeared in the group that was in treatment during 2010. The rate of success in the group that was in IVF treatment during 2010 was 16.6%; of the women in this group (2010, ongoing), 25% had already undergone more than five cycles and 12% of the women had already undergone more than seven cycles.
**Conclusion(s):** Although limited in scope, this study suggests that the policy of limitless nondonor IVF-ET cycles in Israel should be further examined and assessed. (Fertil Steril® 2014;■: ■–■. ©2014 by American Society for Reproductive Medicine.)
**Key Words:** Assisted reproductive technologies, IVF, health policy, health care allocation, culture of perseverance

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There is no doubt that IVF has been a welcome development in reproductive medicine (1). By 2006, it was reported that three million babies had been born with the aid of IVF (2). Estimates in 2008 went up to five million IVF children. At present, the focus of the discussion has shifted from the earlier disapproval of IVF (3, 4) to the level of availability (5–12). It has been suggested that affordable assisted reproductive technologies might stop the falling birth rate in Europe (5, 13). On the other hand, after 30 years, many questions about IVF still remain (3, 4, 14). One of these questions is the effect of long-term IVF treatment on women (15). For instance, in a report from Western Australia by Stewart et al. (16), the success rate of live deliveries becomes a flat line (that is, zero new deliveries) long before the 180 months and number of cycles for which they had data. This means that many Australian women were continuing IVF treatment when there was zero probability of a successful outcome. This begged the question of whether there should be any limit on the number of IVF cycles that women may undergo (17). The following sections of this paper will focus on this question, from the perspective of IVF policies and treatment in Israel.

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## IVF in Israel

According to a report in *Fertility and Sterility*, Israel provides 100% "optimal IVF utilization" (6). Although no explicit reference is made as to how "optimal" was calculated, we may understand that it refers to the highest number of IVF cycles supplied by the health care system: Israel's National Health Insurance covers unlimited cycles of IVF for *all* Israeli women with up to two children in a given relationship, until the age of 45, even if the woman already has living children. Denmark was ranked second best by 2006 but still lags far behind Israel, with only 50% of IVF optimal utilization (6). Indeed, since the 1990s, the rate of IVF cycles in Israel has increased almost two fold among women in their fertile years. According to the Israeli Ministry of Health, the increase in IVF cycles has been higher than the rate of population growth. In 2010, there were 17.8 cycles per 1,000 women (between the ages of 15 and 49 years) compared with 12 cycles in 2000 and eight in 1995. In 2010, 4.2% of all live births in Israel were due to IVF, compared with 2.6% in 2000 (18) (Table 1).

This rate of live births is due to the increased number of cycles per woman. However, the average success rate of IVF (rated by live births) has remained constant for the last decade at 15%–17% of live births per cycle (19).

## Number of Cycles and Effectiveness

In the context of availability and access to IVF, Israeli policy is looked upon by many as the North Star (10, 20). However, is the Israeli policy of endless rounds of IVF effective? The number of IVF cycles a woman may undergo in Israel is unknown. Some women have reported being in IVF treatment for approximately 7 years (21). Translated into cycles of IVF, the number of cycles a woman in Israel may undergo according to this report might be between 35 and 42. Although the Ministry of Health annual reports in other developed countries mention how many cycles of IVF are performed per 100,000 women, in the Israeli open-ended scheme, this information is useless to answer the question of how many rounds a woman may undergo. The information on the Israel Ministry of Health website shows the rate of success per cycle of IVF but does not mention the cumulative rate of success (per number of cycles per woman). The question remains as to how many babies are actually born in Israel after many unsuccessful cycles. Worldwide, the cumulative live-birth rates with IVF are presented as being very high; however, the rate of success after seven failed attempts is zero, or almost zero (22, 23). This paper presents a retrospective analysis, which examines whether the results and effectiveness of open-ended IVF treatment justifies the policy of limitless rounds of IVF in Israel.

**TABLE 1**

**Number of IVF cycles in Israel.**

| Year | No. of IVF cycles | No. of cycles per 1,000 women | Percent of IVF births |
|---|---|---|---|
| 1995 | 5,000 | 8 | 1.7 |
| 2000 | 18,000 | 12 | 2.6 |
| 2006 | 26,000 | 15 | 3.5 |
| 2010 | 31,978 | 17.8 | 4.2 |

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## MATERIALS AND METHODS

This research was approved by the Institutional Review Boards of the hospitals and institutions involved.

## Research Sample

The research included 573 files reviewed during 2011–2013 in two IVF clinics in central Israel and in the northern part of the country. These clinics were chosen because of the multicultural background of the surrounding population. The size of the research sample results from the total number of women who started treatment in 2000 or were in treatment during 2010 in the two clinics that collaborated in this research (initially, five clinics were approached; inclusion in this research was voluntary). From the 573 files reviewed, 38 were excluded owing to incomplete information. In total, 535 files were included in the analysis.

The research sample included two groups: The first group consisted of women who started treatment with IVF in 2000 (hereafter the 2000 cohort) in these clinics ($n = 210$). The reason for choosing a cohort of patients from 2000 as the starting point of this study was twofold: [1] to track records from medical files retrospectively during a decade and [2] to ensure that the 2000 sample did not include women who could still be in treatment, based on Remennick's (21) observation that women may persevere with IVF treatment for seven years or more. The second group consisted of women who were in treatment with IVF during 2010 in these clinics ($n = 350$). The year 2010 was chosen to examine some newer data. The study included only nondonor cycles. Subgroups included age at the start of treatment.

Data included demographic variables (year of birth, country of origin, personal status, number of children) physiological variables (blood count, blood pressure, weight, body mass index), and variables about the treatment with IVF (number of cycles, duration of infertility, pregnancies, births, take home baby, number of hospitalizations during treatment). In both groups, most of the women were married (92%); most of the women were Jewish (78%); other women were Arab citizens including Muslims, Christians, and Druze.

## IVF-ET Treatment

GnRH analog protocol, agonist or antagonist, and controlled ovarian hyperstimulation were chosen on a case-to-case basis according to standard clinical practice. Conventional IVF and/or intracytoplasmic sperm injection (ICSI) were performed according to the cause of infertility. A detailed description of medical protocols; ICSI performance; sperm, oocyte, and zygote handling, as well as ET and luteal phase supplementation has been published previously (24, 25). The number of embryos transferred was in accordance with national guidelines. Cryopreservation of supernumerary embryos was generally performed 48–72 days after oocyte retrieval.