

—Brief Note—

A Constant Room Temperature of 25°C Significantly Enhances the Efficacy of In-Vitro Fertilization

Koichi Kyono*, Noritaka Fukunaga, Kosuke Haigo, Setsuyo Chiba, Yukiko Nakajo and Kohei Fuchinoue

Kyono Reproduction Research Center, Lady's Clinic Kyono, Furukawa, Miyagi 989-6221, Japan

Abstract: We noted varying success rates with IVF on a month-by-month basis from 1998 through 1999. During that interval, we had no control over the room temperature and results appeared to be affected by seasonal temperature fluctuations. Since 2000, we have maintained a constant temperature of 25°C in our operating and culture rooms throughout the year. During that time, our pregnancy rate has been significantly higher than in previous years. Specifically, we noted an improved pregnancy rate during the summer season (June and July). A constant room temperature of 25°C significantly enhances the efficacy of in-vitro fertilization.

Key words: Room temperature, In vitro Fertilization, Pregnancy rate, Quality control

A distinct seasonal fluctuation for many reproductive processes has been noted. Although the seasonality of unassisted human conception rates and birth rates has been well documented, much less is known about the seasonality of reproductive outcome with assisted technologies, particularly *in-vitro* fertilization (IVF) [1]. Although several recent studies suggest the possibility of seasonal variation in the pregnancy rates after IVF, the cause of this variation has not been determined [2–4].

Several studies have found significant differences in pregnancy rates throughout the year. In one Australian study, the pregnancy rate was the lowest in January after the Australian Christmas/New Year vacation [2]. Stolwijk *et al.* reported that the pregnancy rate for women who underwent oocyte aspiration was the

lowest from July to September [3]. Chamoun *et al.* reported that the pregnancy rate in spring was 9.5%—a rate that was significantly lower than those during the summer, fall, and winter (34.8%, 28.5%, and 26.2%, respectively) [4]. At our clinic, in 1998 and 1999, the pregnancy rate after IVF was lower in June and July than in other months. In 1998 and 1999, our clinic had both an air conditioner and a heater, but room temperature and humidity were not constantly maintained. The range of room temperature was 27°C–35°C in summer, but 19°C–32°C in other months. Since January 2000, we have maintained the room temperature at a constant 25°C throughout the year. Although advances have been made in culture media, ovarian stimulation and quality control since 1998, treatment techniques have undergone little change. Therefore, the aim of the present study was to examine the effect of a constant room temperature (25°C) on the pregnancy rates after IVF during different seasons.

Routine clinical methods for ovarian stimulation, IVF (ICSI), and embryo transfer were used. We compared the pregnancy rates for June and July with those of other months in 1998, 1999, 2000, and 2001. Data were analyzed by the chi-square test.

In 1998, 1999, 2000 and 2001, pregnancy rates (June and July versus other months) were: 15.9% (7/44) versus 27.3% (51/187; NS); 9.8% (4/41) versus 26.2% (59/225; $p < 0.05$); 35.4% (23/65) versus 35.4% (113/319; NS); and 43.8% (35/80) versus 45.0% (125/278; NS). These results are summarized in Table 1 and are clearly different before and after 2000. Furthermore, since 2000, the total pregnancy rate was significantly increased over previous years. After we maintained the room temperature at 25°C, pregnancy rates markedly increased, particularly in June and July, and there was no significant difference between these two months and

Received: August 6, 2002

Accepted: August 23, 2002

*To whom correspondence should be addressed.

e-mail: info@ivf-kyono.or.jp

Table 1. Pregnancy rates for June and July versus other months from 1998 through 2001

Year	June and July	Others	Total
1998	15.9% (7/44) ^A	27.3% (51/187) ^B	25.1% (58/231) ^C
1999	9.8% (4/41) ^D	26.2% (59/225) ^E	23.9% (63/266) ^F
2000	35.4% (23/65) ^G	35.4% (113/319) ^H	35.4% (136/384) ^I
2001	43.8% (35/80) ^J	45.0% (125/278) ^K	44.7% (160/358) ^L

A vs B, G vs H, J vs K: NS. D vs E, A vs G, E vs H, H vs K, I vs L: P<0.05. A vs J, D vs G, D vs J, B vs K, E vs K, C vs I, C vs L, F vs I, F vs L: P<0.01.

other months. We found that a stable temperature (25°C) in both the culture and operating room was the most important factor in improving the pregnancy rates after IVF. Despite keeping the culture medium in a dish on a hot plate, the temperature fluctuates in a short time. The ambient room temperature is responsible for this fluctuation [5]. When the room temperature was maintained at 25°C throughout the year, seasonal variations did not affect pregnancy rates. As a result, our clinic's pregnancy rates have increased significantly since 2000.

In conclusion, a constant room temperature of 25°C is a very important factor in IVF results, and it eliminates seasonal variation.

References

- 1) Rojansky, N., Brzenzinski, A. and Schenker, J.G. (1992): Seasonality in human reproduction:an update. *Hum Reprod.*, 7, 735–745.
- 2) Wood, C., McMaster, R., Rennie, G., Trounson, A. and Leeton, J. (1985): Factors influencing pregnancy rates following *in vitro* fertilization and embryo transfer. *Fertil Steril.*, 43, 245–250.
- 3) Stolwijk, A.M., Reuvers, M.J.C.M., Hamilton, C.J.C.M., Jongbloet, P.H., Hollanders, J.M.G. and Zielhuis, G.A. (1994): Seasonability in the results of *in-vitro* fertilization. *Hum Reprod.*, 9, 2300–2305.
- 4) Chamoun, D., Udoff, L., Scott, L., Magder, L., Adashi, Y. and McClamrock, H.D. (1995): A season effect on pregnancy rates in an *in vitro* fertilization program. *J Assist Reprod Gen.*, 12: 585–589.
- 5) Cooke, S. (2001): Practical assessment of ART culture conditions; from incubators to media. 2001: An ART Odyssey, abstract p 41–45.