SHORT COMMUNICATION

Do Lunar Cycles Influence In Vitro Fertilization Results?

Submitted May 20, 2002; accepted May 22, 2002

Purpose: Our objective was to investigate the lunar influence on IVF-ET outcomes.

Methods: Between 1992 and 1999 we have completed 7572 preprogrammed IVF-ET treatment cycles with the same stimulation protocol in two outpatient units. (Vienna, Austria and Budapest, Hungary) Multiple regression (SAS; proc Logistic) and two separate analyses were performed on pregnancy rates using a harmonic sinoidal trend based on the synodic and anomalistic lunar cycles respectively.

Results: The overall pregnancy rate was 30.9%. The amplitude of harmonic sinoidal, trend for the synodic lunar cycles was $x^2 = 1.63, 2 \text{ d.f.}, p = 0.44$ and $x^2 = 6.27, 2 \text{ d.f.}, p = 0.044$ for the anomalistic moon periods. For the anomalistic lunar months the amplitude of harmonic sinoidal trend was borderline in terms of higher pregnancy rates with the moon in Perigee.

Conclusion: The cause of seasonal changes in IVF-ET outcomes is probably very complex. Our results indicate that lunar influence may only be one of the contributing factors. Further studies are needed to clarify unexplained fluctuations of pregnancy outcomes.

KEY WORDS:

INTRODUCTION

Unexplained fluctuations in pregnancy rates have been known to in vitro fertilization and embryo transfer (IVF-ET) providers ever since the introduction of the procedure. It is very frustrating for both physicians and biologists especially when no changes in the stimulation protocols and techniques were instituted. Previous reports on this phenomenon did not address the possibility of the lunar influence (1,2).

Synodic lunar month is the period between successive full or new moons (29 days, 12 h, 44 min, and

3 s) Anomalistic moon month is the interval (27 days, 13 h, 18 min, and 33 s) between successive Perigees (nearest to the earth) and Apogees (farthest to the earth) during lunar months.

MATERIAL AND METHODS

Between January 1, 1992 and April 30, 1999 we had completed 7572 preprogrammed (3) IVF-ET treatment cycles with the same stimulation protocol and technique in our free-standing outpatient units (Vienna, Austria and Budapest, Hungary).

The dichotomous variable "pregnancy yes/no," defined by a positive fetal heartbeat at 8 weeks of gestation was analyzed by multiple regression (SAS; Proc Logistic). Two separate analyses were performed on pregnancy rates using a harmonic sinoidal trend based on the synodic and anomalistic lunar cycles respectively. IVF-ET attempts and not subjects served as sample units.

A harmonic sinoidal trend for certain period length was analyzed in the standard way by adding two regressor variables into the multiple regression model, $\cos(lt)$ and $\sin(lt)$. Here t is the time (in days) starting January 1, 1992 and $l = 2\pi/l$ where l is the period length. The coefficients estimated for these two regressor variables determine the amplitude of the harmonic sinoidal trend.

The influence of other parameters (age, number of previous IVF-ET attempts, the number of transferred embryos and their squares) have been treated as a continuous and isolated variable and reported elsewhere (4).

RESULTS

The overall pregnancy rate was 30.9%. The amplitude of harmonic sinoidal trend for the synodic lunar cycles was $x^2 = 1.63, 2 \text{ d.f.}, p = 0.44$ and $x^2 = 6.27, 2 \text{ d.f.}, p = 0.044$ for the anomalistic moon periods. For the anomalistic lunar months the amplitude of harmonic sinoidal trend was borderline in terms of higher pregnancy rates with the moon in Perigee (near to earth).

CONCLUSION

The cause of seasonal changes in IVF-ET outcomes is probably very complex. Our results indicate that lunar influence may only be one of the contributing factors. Further studies are needed to clarify these

unexplained fluctuations of pregnancy outcomes in IVF clinics.

ACKNOWLEDGMENT

We thank Peter Bauer and Petra Dorau for the statistical analysis.

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