



Review

Bed rest after embryo transfer: is it harmful?

Mert Küçük*

Department of Obstetrics and Gynaecology, Faculty of Medicine, Adnan Menderes University, Turkey

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ABSTRACT

Many interventions have been proposed to increase the success of assisted reproductive techniques (ART). The most controversial is bed rest after embryo transfer (ET). Patients are frequently advised to restrict their physical activity (PA) during ART, and many fertility clinics recommend bed rest after ET for variable periods of time. It is the author's belief, however, that there is insufficient evidence to support the recommendation of bed rest after ET. In fact, accumulated data indicate that bed rest after ET or restriction of PA during ART not only fails to bring about benefits, but may actually be detrimental and associated with worse ART outcomes.

As such, it is considered that the long-standing policy of bed rest after ET should be abandoned. Patients should not be encouraged to rest in bed after ET, and should maintain their routine PA during ART. If the practice is to be changed, it is important to recognize the reasons why patients tend to restrict their PA during this time period. Health professionals may play a key role in this context.

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Contents

1. What is the rationale behind the recommendation for bed rest after ET?	123
2. Do subjects restrict their PA after ET and during ART?	123
3. Is bed rest after ET recommended by clinicians?	124
4. Does bed rest after ET have any impact on the success of ART?	124
5. Why may bed rest after ET be harmful?	124
6. Why does the 'bed rest after ET' approach still find advocates among clinicians?	125
7. What can be done to change the attitudes of patients undergoing ART towards PA restriction?	125
References	125

The success of assisted reproductive techniques (ART) depends upon the individual success of a series of steps. An important stage in achieving success is embryo transfer (ET) [1], and one of the most controversial issues related to this step is bed rest after ET.

1. What is the rationale behind the recommendation for bed rest after ET?

The rationale behind the recommendation for bed rest is the assumption that reduced physical activity (PA) and the supine position will decrease the risk of expulsion of the embryo that has been transferred into the uterus [2]. Waterstone et al. [3] reported

that bed rest after ET was not rational when considered from a physical perspective. They demonstrated that an anteflexed uterus without a distended urinary bladder was almost in the horizontal position when the person is standing compared with the supine position. As such, they encouraged their patients to mobilize immediately following ET.

It has also been reported that movement of embryo-associated air bubbles in the uterine cavity does not change when the patient stands upright after ET [4], and a recent study showed that ET content is not affected by immediate ambulation after ET [5].

2. Do subjects restrict their PA after ET and during ART?

In a study by Bar-Hava et al., the option of bed rest in an ART group was left to the patients. Prior to the study, the patients had been told that there was no benefit in bed rest after ET, yet 60% of

* Tel.: +90 256 2123036.

E-mail address: dr.mertkucuk@gmail.com.

the patients wished to be included in the bed rest group [6]. In a study by Su et al., 56 out of 60 participants practised bed rest for at least 2 h after ET, and most patients reduced their PA for 14 days after the procedure by avoiding activities such as climbing stairs and routine social engagements, and walking slowly [7].

The International Physical Activity Questionnaire has been used to measure PA objectively and calculate energy expenditure [8]. Patients were found to reduce their energy expenditure significantly during ART [8]. In another study, the Godin leisure-time exercise questionnaire was used to assess PA status, and patients were found to restrict their PA during ART [9]. The evaluation of all of these findings revealed that patients reduce their PA during ART.

3. Is bed rest after ET recommended by clinicians?

Bed rest has been recommended to patients since the beginning of the in vitro fertilization (IVF) era [6]. Initially, the recommendation was 24 h of bed rest after ET, and this advice has changed with time to specific recommendations on a minute basis [6]. Jones [10] advised patients to remain in a prone position for 4 h after ET. Later, Schmidt [11] expanded this time frame, recommending bed rest for 18–24 h following ET. Trotnow et al. took the issue even further [12], advising a full 24 h of bed rest. In a survey sent to IVF centre administrators in Australia and New Zealand, respondents indicated that bed rest after ET was more important than monitoring the ET procedure by ultrasound, or trial transfer [13].

Nowadays, although no clinical or experimental data indicate that bed rest after ET is advantageous, many fertility centres still recommend bed rest and restricted PA after ET [14]. Patients are not being advised to maintain the PA levels they had been practising before ET [9]. A previous study by the author's group found that a large majority of patients practised bed rest after ET, and the majority of patients had not been advised to maintain their routine level of PA during ART [9].

4. Does bed rest after ET have any impact on the success of ART?

Changing the long-standing policy of bed rest after ET is a difficult process. In 1988, Waterstone et al. reported that bed rest after ET was anatomically irrational, recommending that patients should mobilize immediately after ET and continue with their routine activities [3]. The researchers further established that the clinical pregnancy rates at their clinic rose from 21% to 42% following introduction of the immediate ambulation policy.

Subsequently, Sharif et al. compared the results attained in patients who ambulated immediately after ET at their clinic with the IVF cycles reported in the UK national database. The clinical pregnancy rate was higher at the clinic (23.5% vs. 18.6%) [15]. In a study by Bar-Hava et al., 167 out of 406 patients were ambulated immediately after ET. The remaining 239 patients were placed on bed rest for 1 h [6]. The pregnancy rates in the immediate ambulation group and bed rest group were 24.55% and 21.34%, respectively. Although the difference was not significant, the higher pregnancy rate in the immediate ambulation group is noteworthy.

In a study by Rezábek et al. [16], patients in the immediate ambulation group were permitted to go home immediately after ET, and patients in the bed rest group were discharged after one night of bed rest at the hospital following ET. No significant differences were observed in the age, stimulation protocol, number of previous ART cycles and number of embryos transferred between the two groups. The implantation rates in these two groups were 22.5% and 14.5%, respectively; the pregnancy rates were 50% and 22.2%, respectively; and the 'take-home-baby' rates were 40% and 11%, respectively; all higher in the immediate ambulation group. The implantation rate of high-quality embryos

was also higher in the immediate ambulation group (25.8% and 16.7%, respectively). The researchers terminated the study on ethical grounds (worse results and more difficult therapy associated with bed rest after ET) before any significant results could be reached [16].

Botta and Grudzinskas compared 24 h of bed rest after ET with 20 min of bed rest after ET, and found no benefit of extended bed rest after ET [17]. Amarin et al. compared 1 h of bed rest after ET with 24 h of bed rest after ET. The implantation rate in the 24-h group was significantly lower than the implantation rate in the 1-h group [1]. Purcell et al. compared a group of patients who were discharged from the clinic immediately after ET and a group that had 30 min of bed rest after ET. Although the difference was not significant, they found that the ongoing pregnancy rate was higher in the patients who were discharged immediately (50.98% vs. 47.06%) [2].

In a study where the International Physical Activity Questionnaire was used to calculate energy expenditure, there were significantly more live births per oocyte retrieval in the moderate-PA group during ART compared with the low-PA group (47.6% vs. 22.1%). It is of note that the study's endpoint was the number of live births [8].

The majority of the studies discussed above proposed an association between bed rest after ET and poorer ART outcomes compared with no bed rest or shorter periods of bed rest. It is therefore the author's belief that clinicians need to change their perspectives on the accumulated data. Authors have generally preferred to analyze their data from the perspective that no bed rest does not bring about worse results, and have focused on this when analyzing their data.

Very few authors have claimed that bed rest after ET leads to worse ART results [8,16]. Publication bias, which refers to the tendency for researchers to report their findings in a manner which makes them more likely to be published, may be problematic. It is the author's belief that researchers need to work from the starting point of postulating that bed rest after ET might bring about negative ART outcomes. Only in this way can there be an accurate perspective and a revolution in thinking about the subject of bed rest after ET.

5. Why may bed rest after ET be harmful?

It has been shown that restriction of PA after ET may increase levels of stress and anxiety. Compared with the fertile population, negative psycho-emotional experiences are more prevalent in the infertile population, both before and during treatment [18]. Anxiety and depression have been found to be more prevalent in patients who have experienced an unsuccessful ART procedure compared with patients who have experienced a successful outcome [19–21].

It is also known that anxiety levels increase in patients during ART [22]. It is quite possible that bed rest after ET or a physician's recommendation to restrict PA may induce additional stress and anxiety. Another factor that may cause additional stress could be the patient's own decision to restrict their PA for a longer period than was originally advised. It has been reported that patients have been known to extend the PA limitation to 14 days or more after ET in an effort to increase the success of ART [7,8].

Immediate ambulation after ET or unrestricted PA during ART may make patients feel safer and less stressed [6]. It has been claimed that stress experienced by patients may have biological effects on the success of ART (e.g. the number of retrieved and fertilized oocytes) [23]. Stress, anxiety and depression may have such an effect via hormonal and endorphin mediators [24]. It has also been speculated that maternal stress can be relieved by a return to routine PA [25].

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