



Rational of bed rest in high-risk pregnancy

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Abstract: A woman's pregnancy is seen as a unique and common time of her life. The recommendation to restrict physical activity and remain in bed when pregnant has been given to women for more than a century. For about 20% of all pregnant women, antepartum bed rest or activity restriction is advised to minimize negative outcomes linked to problems of high-risk pregnancies. Antepartum bed rest or activity restriction is prescribed for roughly 20% of all pregnant women to help prevent complications from high-risk pregnancies. More than 70% of maternal fetal medicine clinicians recommended bed rest for preterm labor, and around 90% of them recommended it for premature membrane rupture. Numerous medical issues necessitate bed rest for pregnant women. In contrast to the extensive list of these scenarios, there is little evidence in favor of bed rest. While some of the challenges weren't specifically studied and others had only been lightly looked at. The World Health Organization and the American College of Obstetricians and Gynecologists both agree that further research is required to fully understand the advantages and disadvantages of bed rest for both the mother and her fetus.

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Introduction

Pregnancy is seen as a special and normal stage of a woman's life. Pregnant women are often advised to limit their physical activity and stay in bed, a practice that has been around for more than a century. For about 20% of all pregnant women, antepartum bed rest or activity restriction is advised to minimize negative outcomes linked to problems of high-risk pregnancies (Hegaard et al., 2010).

Premature rupture of membranes (PROM), unselected multiple gestations, vaginal bleeding, gestational hypertensive disorders, cervical incompetence, threatened miscarriage, hypertensive disorders, foetal growth restriction, placental abnormalities, and chronic hypertension are pregnancy-related complications that are thought to increase the risk of preterm birth in women with these conditions (Romero et al., 2010).

Bed rest as a treatment for some cases of pregnancy has a financial cost of up to US\$7 billion annually in the US. Earlier meta-analyses found little support for outpatient hospitalization for bed rest. 5,6 Up to 95% of clinicians continue to advise bed rest, nonetheless. Further research is needed to determine the benefits and drawbacks of bed rest for the mother and her fetus, according to the World Health Organization and the American College of Obstetricians and Gynecologists (Matenchuk et al., 2019).

Epidemiology of the use of antepartum bed rest

A common obstetrical intervention is bed rest. Approximately 20% of pregnant women will receive a recommendation for bed rest at some point. Where bed rest is frequently employed for a variety of causes. An evaluation of views toward the use of bed rest for the two main pregnancy problems of preterm labor and premature membrane rupture (PROM) was conducted in 2009 among providers of maternal foetal medicine (MFM) (Bigelow & Stone, 2011). Bed rest was advised by more than 70% of MFM clinicians for preterm labor and approximately 90% of them for PROM. Even Nevertheless, most of the same doctors claimed that bed rest offered no benefit. Depending on whether bed rest is recommended at home or in a hospital, the actual adherence to it can be rather poor (Sajjad et al., 2020). Because they are uncertain about the intervention's likelihood of success, women typically don't adhere to the bed rest advice strictly (Cescutti-Butler et al., 2019). Another study found that although women were aware of the advice to stay in bed for various pregnancy issues, many of them were unable to follow this course of action (Sahoo et al., 2015).

Clinical conditions for which bed rest is prescribed

There are numerous health conditions that call for pregnant bed rest. Contrary to the lengthy list of these circumstances, the evidence supporting bed rest is sparse (Medley et al., 2018). Whereas some of the difficulties weren't explicitly researched and others had only been marginally examined (Meah et al., 2020).

Bed rest following embryo transfer

The final resort for those with subfertility is in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI). In 2018, marked the 40th birthday of the first child born via IVF treatment (Ombelet et al., 2020).

Doctors typically advise their patients to rest in the supine position for 30 minutes after transferring fertilized embryos into the uterus using a tiny catheter, and to limit their activity for the remainder of the day (Zemet et al., 2021).

Bed rest after an embryo transfer (ET) is not favourable in terms of clinical pregnancy rate, ongoing pregnancy rate, live birth rate, implantation rate, or miscarriage rate, according to a comprehensive study and meta-analysis published in 2019 (Cozzolino et al., 2019). Whereas prompt mobilization following an embryo transfer wouldn't harm success rates after an embryo transfer (Healy et al., 2015).

According to a study, there were no appreciable variations in the success rates of IVF between patients who rested in bed for 10 minutes after an ET and those who got up right away (Schoolcraft, 2016).

Bed Rest during High-risk pregnancy.

High-risk pregnancy shows high psychosocial stress to pregnant woman and the family. According to the literature, high-risk pregnancy affects the psychological health status of mother and neonate badly, damages the development of maternal-fetal attachment (McCoyd et al., 2020).

High-risk pregnancies are caused by illnesses that pose a threat to the mother's health, such as chronic hypertension, autoimmune disorders, and heart disease, as well as pregnancy-related complications like placental abnormalities and early membrane rupture and unfavorable environmental factors, unhealthy lifestyles, and teenage pregnancy (Lee et al., 2014)

One of the most important needs of women with high-risk pregnancies during bed rest and the postpartum period is the need for extensive support. The four basic kinds of comprehensive support are psychosocial support, caring for older children, handling personal business and household chores, and economic support (Janighorban et al., 2016).

Additionally, the development of maternal-fetal attachment is hampered by the stress associated with a high-risk pregnancy. Additionally, psychological stress in expectant mothers rises in proportion to the severity of pregnancy-related issues (McNamara et al., 2019).

Numerous high-risk pregnancy issues are managed by obstetricians using maternal activity restriction, such as bed rest (Rubarth et al., 2012). Even though numerous studies suggested that many high-risk pregnant women do not benefit from a consistent prescription of bed rest (Maloni, 2011).

The health state of the mother and newborn is negatively impacted by bed rest in both the short- and long-term. Women frequently express grief when they learn that their pregnancy is high-risk and that they must rest in bed. Additionally, extended bed rest is associated with negative consequences for expectant mothers and their families. The detrimental physiological effects of bed rest include muscle atrophy, bone loss, weight loss, thrombosis, exhaustion, and disturbed sleep disorders (James et al., 2010).

For families of high-risk expectant mothers and the women themselves, the bed rest phase is challenging and requires special care. One of the most important needs is psychosocial support, and it is expected that families, friends, and peers will take care of it (Rubarth et al., 2012). According to a study, women who were pregnant at high risk had many uncertainties and concerns about preterm labor and miscarriage (Coomarasamy et al., 2021).

A study found that husbands' attention, care, sympathy, and protection of wives during pregnancy have a significant supportive role (Abdollahpour et al., 2015). While, The expectant woman's worries and worry were due to her husband's lack of strong support (Effati-Daryani et al., 2020). A research recommended having support groups for women with high-risk pregnancy during bed rest as a significant step toward helping them in accepting the situation (Janighorban et al., 2018).

Bed rest and preterm birth

In 2014, it was conducted a literature review examining the evidence underpinning activity restriction to reduce preterm birth. They reported that there is no strong evidence supporting the effectiveness of bed rest to decrease preterm birth (Sosa et al., 2015). In 2019, meta-analysis of randomized studies in developed and developing countries looking at outcomes with maternal bed rest (Matenchuk et al., 2019). Where, Another studies found that women with and without bed rest

experienced the same maternal and fetal results (Maloni, 2011), (da Silva Lopes et al., 2017).

Another non-randomized research found that bed rest affects premature birth (Matei et al., 2019). Bed rest was linked to a higher likelihood of preterm births, according to a 2018 study by the US Preterm Prediction (Walsh, 2020).

After adjustment for confounding variables, the sub-group on bed rest were almost double as likely to deliver before 37 weeks and four times as likely to deliver before 34 weeks (Steinweg et al., 2020). The US Society for Maternal-Fetal Medicine study from 2020 found that bed rest was linked to an increased risk of preterm birth, along with several previous studies of high-risk individuals (Rousseau et al., 2020)

Bed rest and multiple pregnancies

Many obstetricians and many pregnant women with multiples believe that bed rest in the late second or third trimester may be helpful in reducing the likelihood of premature birth. It was established that standard hospital bed rest did not reduce the prevalence of preterm birth or perinatal morbidity in the group of women receiving bed rest (Pregnancies, 2014).

It has also been demonstrated that women who are placed on bed rest for multiple gestations acquire weight at a substantially lower rate than is suggested for carrying twins or triplets. They report greater antepartum bed rest symptoms than women with singleton pregnancies (about 8 symptoms) or women with healthy, normal pregnancies who do not need bed rest (around 22 symptoms) (M. E. Lawrence et al., 2022)

For women carrying multiple pregnancies, bed rest throughout the second part of pregnancy has frequently been recommended as a policy (Crowther & Han, 2010). Researches have shown that the standard practice of requiring hospitalization and bed rest for women carrying multiples didn't reduce the rate of preterm delivery or perinatal mortality (Fuchs & Senat, 2016),(Roman et al., 2020) . On the other hand, the infants' growth and women's attitudes regarding bed rest are not sufficiently covered in the literature. Even the scant information revealed that many women felt depressed and uneasy about this strategy (M. E. Lawrence et al., 2022).

In the United States, the frequency of multiple births is geometrically rising, primarily because of advancements in assisted reproductive technology (Uyar & Seli, 2014).

Multiple pregnancies significantly increase perinatal morbidity and mortality and put babies at risk for premature delivery, low birth weight, and other complications. Learning impairments, developmental

delays, or even more serious issues like chronic lung disease, blindness, and cerebral palsy can all be long-term effects of premature delivery. Approximately 14% of newborn deaths are the result of multiple births (Qazi, 2011).

Bed rest has negative impacts on multiple pregnancies. Even though the mother gained little weight while on bed rest, the baby was born at the right weight. This can indicate that the baby keeps gaining weight at the mother's expense (Maloni, 2011). There is inadequate data to support the suggestion of routine bed rest in women carrying multiple pregnancies (M. Lawrence, 2021).

Bed rest and intrauterine growth restriction (IUGR)

Pregnancy complications such as fetal growth restriction (FGR) are common in both developed and developing nations (Accrombessi et al., 2018). Intrauterine growth restriction (IUGR) has a variety of etiologies, including fetal, maternal, and environmental factors (Darby et al., 2020). Vascular disease (such as hypertension or diabetes), hypercoagulable states, toxins (such as cigarette or illegal drug use), and chronic hypoxia are some examples of well-researched maternal causes of FGR (Nardoza et al., 2012).

Another significant factor contributing to FGR is placental insufficiency. Preterm birth is associated with growth limitation, and the aftereffects of prematurity, such as neonatal respiratory distress syndrome, necrotizing enterocolitis, and intraventricular hemorrhage, are frequently more severe in these infants (Audette & Kingdom, 2018).

The underlying etiology influences the treatment option for FGR. In an effort to increase uteroplacental perfusion and boost fetal growth, bed rest is frequently advised (Melamed et al., 2021). The only randomized controlled trial (RCT) looking at hospital bed rest for FGR was unable to show that it improved either fetal growth or pregnancy outcomes (Reeves & Galan, 2017).

Only the aforementioned RCT was examined in a 2010 Cochrane evaluation of bed rest for FGR. The authors of the review came to the additional conclusion that there isn't enough information in the literature to suggest bed rest for patients with suspected IUGR. This paucity of research points to the necessity of a well-designed RCT investigating bed rest as a means of preventing or enhancing FGR (Bigelow & Stone, 2011).

Bed rest in mild and severe preeclampsia

Preterm birth and fetal growth limitation are caused by preeclampsia, which complicates 2 percent to 8 percent of pregnancies³⁰. Preeclampsia can cause

eclampsia, which can lead to seizures, stroke, liver and kidney failure, and blood clotting issues in pregnant women (such as disseminated intravascular coagulation). Preeclampsia is commonly managed with some form of activity restriction (Riise et al., 2017).

According to one school of thinking, since systolic blood pressure is higher while one is upright, lying down might lower pressures and alleviate preeclampsia and pregnant hypertension symptoms. Although this has not been thoroughly researched, some writers contend that the diuretic effect of bed rest may be beneficial for patients with pregnant hypertension (but not preeclampsia) (Oliveira et al., 2017).

Mathews' early studies on bed rest for preeclampsia and nonproteinuric hypertension were conducted in the late 1970s and early 1980s, respectively. In an RCT conducted in 1977, 135 women were examined to determine the effects of bed rest and sedation for gestational hypertension on maternal and newborn outcomes. When compared to women who were permitted to engage in regular daily activity, women who were given phenobarbital and sedated while on bed rest did not experience better outcomes (Bigelow & Stone, 2011).

The first RCT on antepartum bed rest for preeclampsia was conducted in 1982 by Mathews et al. The authors monitored levels of human placental lactogen (a measure of placental function) after randomly assigning 40 women to either full bed rest or full ambulation. Estriol, urate, fetal growth, eclampsia premonitory symptoms (growing headache, vision abnormalities, epigastric discomfort, and vomiting), and probable surrogate for fetal well-being. It was discovered that a subset of 10 high risk patients had hyperuricemia and significant fetal development retardation. Because of the small sample size and absence of statistical significance, it is challenging to draw conclusions about the genuine benefit of bed rest for preeclampsia patients' fetal outcomes (Lauder et al., 2020).

It's important to note that eclampsia is a serious pregnancy complication marked by neurological issues and seizures in the expectant mother. It is crucial to prevent eclampsia, so the suggestion that bed rest may raise women's risk of developing eclampsia is extremely alarming. As a baseline standard of treatment, bed rest has been utilized in several randomized trials for the therapy of preeclampsia; however, these studies did not compare the outcomes of bed rest groups with those of non-bed rest groups (Townsend et al., 2016).

Given the well-known negative effects of bed rest, instituting bed rest for all normotensive pregnant

women seems like an unnecessarily harsh technique to prevent preeclampsia (Orozco, 2019).

Bed rest for threatened abortion

Vaginal bleeding that occurs before to the fetus's viability is referred to as a threatened abortion. Most threatened abortions result in normal pregnancy outcomes, however some result in fetus miscarriage. The most prevalent causes of spontaneous abortion are fetal or chromosomal abnormalities, while maternal risk factors like advanced age and tobacco use can play a role (Kanmaz et al., 2019).

Diddle et al. conducted the initial research on activity limitation for threatening abortion in 1953. Despite their discovery that routine activity did not increase the likelihood of an unavoidable abortion, they nonetheless advised bed rest to prevent maternal blood loss (if hemorrhage occurred) (McCall et al., 2013). This practice has persisted and was re-studied despite the early finding that bed rest did not enhance outcomes for threatening abortion (Hendriks et al., 2019).

Another study on bed rest for threatened abortion looked at women with threatened abortion worsened by sub chorionic hematoma, they found that patients who adhered to the bed rest regimen had a lower risk of miscarriage (Naz et al., 2022).

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