Prevention of Preterm Birth in Modern Obstetrics

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KEYWORDS

• Preterm birth • Preterm birth prevention • Progestins • Cerclage • Pessary

KEY POINTS

- Tocolytic therapy may be useful for delaying delivery long enough to permit administration of antenatal corticosteroids and/or maternal transport to a tertiary care center, but long-term use does not result in clinically significant pregnancy prolongation.
- Activity restriction has no proven benefit in the prevention of preterm birth and may result in substantial maternal morbidity.
- Cervical pessary usage is a potentially promising intervention, but further research is needed to determine the effectiveness of this device.
- Progestin prophylaxis and, in certain situations, cerclage placement are the most effective interventions in prevention of recurrent spontaneous preterm birth.
- Although there has been progress in recent decades, obstetricians and researchers still have a long way toward preventing preterm birth.

Preterm birth (PTB) continues to be the leading cause of neonatal death, causing more than 1 million deaths worldwide each year. In the United States, 11.72% of all babies were born before 37 weeks of gestation in 2011, representing the lowest PTB rate in more than a decade.[1] Despite this reassuring trend, the United States continues to have the highest PTB rate of any industrialized country. Despite the dedication of billions of dollars and untold hours of work, the solution to the problem of PTB remains elusive worldwide. This article focuses specifically on prevention of spontaneous preterm delivery, processes that account for 70% to 80% of all early births. The

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interventions that have been attempted to prevent spontaneous PTB are reviewed, some of which have been successful in some populations, whereas others have ultimately fallen out of favor because of lack of effectiveness.

INEFFECTIVE INTERVENTIONS

Home Tocometry

Home uterine activity monitoring has been proposed as a method of identifying women in early preterm labor, potentially allowing intervention to prevent delivery. This type of monitoring may be performed via subjective patient report or, more commonly, via use of home tocometry. Despite being initially heralded as a useful tool, tocometry has since fallen out of favor.

Numerous randomized controlled trials have evaluated the use of home monitors such that an exhaustive review of all of the available literature is beyond the scope of this article. For example, a recent Cochrane Review included 15 randomized controlled trials.[2] This meta-analysis showed no reduction in delivery before 37 weeks of gestation with home uterine monitoring.[2] When low-quality studies were excluded from the analysis, there were also no significant reductions in PTB before 34 weeks of gestation or neonatal intensive care unit admissions.[2]

If there is any benefit to home uterine activity monitoring, it may simply be the increased exposure of high-risk patients to specialized nurses and/or physicians. At present, the American College of Obstetricians and Gynecologists does not recommend use of home tocometry to screen for or prevent spontaneous PTB.[3]

Tocolytics

Several tocolytic agents have been used over the last several decades. These agents vary in mechanisms of action, dosing regimens, and side effects but they all have one thing in common: their lack of efficacy in preventing PTB. As shown in **Table 1**, these agents may be beneficial in the short term, thereby allowing administration of antenatal corticosteroids and/or maternal transport to a level 3 center, but long-term effectiveness has not been shown. These agents are almost destined to fail because they are not initiated until it is too late.[16] By the time a woman presents with symptomatic preterm labor or preterm premature rupture of membranes, the underlying process has been ongoing for weeks if not months.[16] Tocolytic agents thus address the symptoms of preterm labor without affecting the cause of the process.[16]

Activity Restriction

Many women diagnosed with advanced cervical dilatation, advanced cervical effacement, or threatened preterm labor are asked to adhere to activity restrictions. Activity restriction is probably the most commonly prescribed intervention to prevent PTB. These restrictions range from light restriction (1 hour or less of continuous rest during waking hours) to moderate restriction (1–8 hours of continuous rest) or even strict bed rest.

Despite its common use, literature supporting the efficacy of bed rest for prevention of spontaneous PTB is lacking, with randomized controlled trials showing no benefit.[17,18] Furthermore, although the recommendation for bed rest is primarily based on a no-harm-no-foul principle, emerging data indicate that there are potential negative effects to activity restriction. Pregnant women in general are at an increased risk for venous thromboembolic disease, a risk that is only increased in the setting of bed rest. Activity restriction is also associated with a significant decrease in muscle strength and coordination, and there are psychological and socioeconomic impacts that must be considered. Not only can activity restriction result in financial difficulties

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