OBSTETRICS

The recommendation for bed rest in the setting of arrested preterm labor and premature rupture of membranes

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OBJECTIVE: The objective of the study was to estimate practice patterns regarding bed rest in women with preterm premature rupture of membranes (PPROM) and arrested preterm labor.

STUDY DESIGN: This was a mail-based survey of all Society for Maternal-Fetal Medicine members in the United States asking whether they would recommend bed rest in the setting of arrested preterm labor or PPROM at 26 weeks. Bed rest was defined as no more than 1-2 hours per day out of bed, with permitted activities including bathroom use, bathing, and brief ambulation inside the home/hospital.

RESULTS: Seventy-one percent and 87% would recommend bed rest for women with cervical dilation and arrested preterm labor and women with PPROM, respectively, even though the majority believed bed rest was associated with minimal or no benefit. Female sex, nonacademic practice, and practice location in the South or West were independently associated with the recommendation for bed rest.

CONCLUSION: Despite the belief that bed rest is associated with minimal or no benefit, most maternal-fetal medicine specialists recommend bed rest for arrested preterm labor and PPROM. Randomized, prospective trials are needed to evaluate the efficacy of bed rest in these settings.

Key words: bed rest, pregnancy, preterm labor, preterm premature rupture of membranes

Bed rest is commonly prescribed during pregnancy for various indications, with limited supporting evidence.[1-3] Two common indications are after an acute episode of preterm labor or after preterm premature rupture of membranes (PPROM). Possible benefits attributed to bed rest are reduction in contractions; prolongation of pregnancy; and in the case of PPROM, to possibly prevent cord prolapse or to enhance amniotic fluid reaccumulation.[4] However, there is limited evidence supporting these hypotheses or the resulting recommendation for bed rest. One randomized trial designed to address the utility of hospitalization after arrested preterm labor found no benefit to this intervention.[5] In this study, both groups were encouraged to decrease their activity, but bed rest was not strictly enforced.

There has never been a randomized trial evaluating the efficacy or safety of bed rest in patients with PPROM. Additionally, there are potential risks to bed rest, including the increased risk of venous thromboembolism,[6] depression,[7] decreased bone density,[8] and decreased muscle mass.[9,10]

Because of the limited available evidence regarding bed rest for the treatment of preterm labor and PPROM, decisions regarding its use are left to regional practice patterns and physician preference. There are no studies reporting the practice patterns of obstetricians or maternal-fetal medicine specialists regarding bed rest for these specific indications. Additionally, there are no reports describing obstetricians' approaches toward the possible benefits and risks associated with bed rest in these circumstances. Finally, it is possible that practice patterns regarding bed rest could vary based on the demographics of the physician.

The purpose of this study was to estimate practice patterns regarding the recommendation for or against bed rest in the setting of preterm labor and PPROM among a large group of maternal-fetal medicine specialists. Our hypothesis was that the recommendation for or against bed rest would vary based on the perceived risks and benefits to bed rest and obstetrician demographics.

MATERIALS AND METHODS

We conducted a mail-based survey of all Society for Maternal-Fetal Medicine (SMFM) members with a US address. An initial mailing was sent in June 2007, and a second mailing was sent to nonresponders 3 months later. The SMFM mailing list is available to SMFM members for an administrative fee and is updated regularly. Weill Cornell Medical College Institutional Review Board approval was obtained prior to mailing any surveys.

The survey consisted of multiple-choice questions based on specific clinical scenarios. Two scenarios addressed arrested preterm labor and PPROM, respectively. The scenario for arrested preterm labor was worded as follows: "A 24-

year-old G1P0 [gravida 1 para 0] with an uncomplicated singleton pregnancy is being treated at 26 weeks for preterm labor. Her cervix is 3 cm dilated, with intact membranes. She has completed a 48-hour course of steroids and tocolytics. Fetal status is reassuring, there are no clinical signs of infection, vital signs are normal, and there is no vaginal bleeding." The scenario for PPROM was worded as follows: "A 24-year-old G1P0 with an uncomplicated singleton pregnancy presents at 26 weeks with ruptured membranes. You plan to administer a course of steroids and antibiotics. Fetal status is reassuring, there are no clinical signs of infection, vital signs are normal, there is no vaginal bleeding, and there are no uterine contractions."

For each scenario, the respondents were asked what their approach would be toward bed rest after 48 hours of steroids were completed. Because there are many possible levels of reduced activity, we defined bed rest as the following: no more than 1-2 hours per day out of bed, with permitted activities including bathroom use, bathing, and brief ambulation inside the home/hospital. Because there is limited evidence addressing bed rest, we assumed that some obstetricians may not specifically prescribe bed rest but would be comfortable with the patient undertaking bed rest if she desired to do so.

Therefore, we offered 3 possible choices regarding the approach toward bed rest in each of the 2 scenarios: (1) I would recommend it; (2) I would not recommend it, but if the patient desired it, I would prescribe bed rest; and (3) I would not recommend it, and if the patient desired it, I would not prescribe bed rest.

Additionally, respondents were asked to select how much benefit (none, minimal, moderate, significant) and how much risk (none, minimal, moderate, severe) would be associated with bed rest in each scenario. Respondents were also asked a number of demographic questions regarding age, sex, year and location of training, practice style and location (US state), and local neonatal intensive care unit level. Geographic location was converted from US state to

region based on the US Census Bureau definition of the 4 regions in the United States (Northeast, Midwest, South, and West).

Fisher's exact test and χ^2 were used for categorical variables, and Student's t-test was used for continuous variables. Multiple logistic regression was used to adjust for confounding variables (SPSS 12.0 for Windows; SPSS, Inc, Chicago, IL). Multiple responses to the same question and responses left blank were censored.

RESULTS
A total of 1874 SMFM members were identified and mailed questionnaires. Sixty-two questionnaires were undeliverable, leaving a total study population of 1812. Eight hundred twenty-seven questionnaires were returned, for a response rate of 46%. Twelve respondents indicated they had retired or did not practice obstetrics, and 1 other did not respond to both questions about bed rest. Therefore, our data are from 814 SMFM members. The demographics of the respondents are shown in Table 1. Compared with the entire surveyed population, respondents had a similar sex breakdown (59% men, 41% women vs 61% men, 39% women) and geographic distribution (27% Northeast, 20% Midwest, 29% South, 24% West vs 27% Northeast, 20% Midwest, 31% South, 22% West).

Seventy-one percent and 87% of respondents indicated they would recommend bed rest in the setting of arrested preterm labor and PPROM, respectively (Table 2). Another 18% and 8%, respectively, indicated they would not recommend bed rest but would prescribe it if the patient desired it. Only 11% and 5% of respondents indicated they would not prescribe bed rest, even if the patient desired it for arrested preterm labor and PPROM, respectively.

The large majority of respondents indicated they would recommend bed rest despite the fact that 72% and 56% responded that there was minimal or no benefit associated with bed rest for arrested preterm labor and PPROM, respectively. Eighty-four percent and 86%

believed there was minimal or no risk associated with bed rest for arrested preterm labor and PPROM, respectively.

The recommendation for bed rest was associated with the perceived associated benefits and risks to bed rest. In the setting of arrested preterm labor, compared with those who recommended bed rest, those who did not recommend bed rest were more likely to believe it was associated with minimal or no benefit (98.3% vs 61.6%, $P < .001$) and were more likely to believe it was associated with moderate or severe risk (37.8% vs 7.9%, $P < .001$).

In the setting of PPROM, compared with those who recommended bed rest, those who did not recommend bed rest were also more likely to believe it was associated with minimal or no benefit (99.1% vs 49.6%, $P < .001$) and were also more likely to believe it was associated with moderate or severe risk (34% vs 9.1%, $P < .001$).

We evaluated demographic characteristics to identify those associated with the recommendation for bed rest. In the setting of arrested preterm labor, the recommendation for bed rest was associated with older age, greater years since residency, and a nonacademic practice (Table 3). In the setting of PPROM, the recommendation for bed rest was associated with a nonacademic practice and practice region, with bed rest being recommended most frequently in the South and West regions.

To identify demographic characteristics independently associated with the recommendation for bed rest, we performed a multiple logistic regression analysis controlling for age, sex, years since residency, practice location in the South or West regions, and practice type (academic vs nonacademic). In the setting of arrested preterm labor, the recommendation of bed rest was independently associated with female sex (odds ratio [OR], 1.47; 95% confidence interval [CI], 1.03-2.09; $P = .04$) and a nonacademic practice (OR, 1.97; 95% CI, 1.34-2.89; $P = .001$). In the setting of PPROM, the recommendation of bed rest was independently associated with a nonacademic practice (OR, 2.13; 95% CI, 1.19-3.80; $P = .01$) and practice in