Anesthesiology 2010; 112:1519–24

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Perioperative Medicine

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Outcomes after internal versus external tocodynamometry for monitoring labor. NEJM 2010; 362:306–13

The use of internal tocodynamometry monitoring is recommended in select circumstances and may provide a more accurate assessment of contractions compared with external monitoring. However, it is unclear how this affects operative deliveries and fetal distress.

This randomized, multicenter, controlled trial was conducted in six hospitals in The Netherlands to compare internal tocodynamometry with external monitoring of uterine activity in women for whom induced or augmented labor was required to measure the rate of operative deliveries, including both cesarean sections and instrumented vaginal deliveries.

Women (n = 1,456) were randomly assigned to receive either internal tocodynamometry (n = 734) or external monitoring (n = 722). There was no difference between the rate of operative delivery in the internal (31.3%) and external monitoring (29.6%) groups ($P < 0.50$; relative risk = 1.1 with the internal monitoring group). Analgesic use was also similar between the internal and external monitoring groups (epidural, 39.4 *vs.* 38.0%, respectively; and morphine, 16.1 *vs.* 16.6%, respectively). Neonatal outcomes including Apgar scores were also similar at all time points between groups. There were no reported complications or deaths (neonatal or maternal) from the use of intrauterine pressure catheters.

Interpretation

In women who received internal or external tocodynamometry during induced or augmented labor, operative delivery rates were approximately 30% and were not different between the two groups. Internal tocodynamometry does not seem to provide additional information that impacts patient care. Although not studied explicitly, these results suggest that using epidural analgesia should not be influenced by what type of monitoring is used.

Preventing surgical-site infections in nasal carriers of *Staphylococcus aureus*. NEJM 2010; 362:9–17

The risk of healthcare-associated *Staphylococcus aureus* infections is three to six times higher in the nasal carriers of the organism. Conflicting results have been reported from studies testing the intranasal application of mupirocin for decolonization of nasal and extranasal sites of *S. aureus* in various patient populations. The current study explored whether testing and treatment of nasal and skin for the presence of *S. aureus* at admission would prevent hospital-associated *S. aureus* infections.

In a randomized, double-blind, placebo-controlled, multicenter trial, real-time polymerase chain reaction assay was used to identify the carriers among patients admitted to surgery and internal medicine departments. Patients were then treated with mupirocin nasal ointment and chlorhexidine soap or placebo.

A total of 6,771 patients were screened on admission over a 2-yr period. A total of 1,270 nasal swabs from 1,251 patients were positive for methicillin- and mupirocin-susceptible *S. aureus*. We enrolled 917 of these patients in the intention-to-treat analysis, of whom 808 (88.1%) underwent a surgical procedure.

The rate of *S. aureus* infection was lower in the mupirocin–chlorhexidine group when compared with the placebo group (3.4% *vs.* 7.7%; relative risk of infection, 0.42). There was no difference in the outcomes between surgical and nonsurgical patients. The effect of treatment was most pronounced for deep surgical-site infections (0.9% *vs.* 16%, for the treatment and placebo groups, respectively; relative risk, 0.21). The time to the onset of nosocomial infection was significantly shorter ($P = 0.005$), and the mean duration of hospitalization was significantly longer in the placebo group than in the treatment group ($P = 0.04$). Adverse events were short-lived local irritation of the nose and skin.

Interpretation

Nasal *S. aureus* carriers, identified by polymerase chain reaction assay, who received mupirocin nasal ointment and chlorhexidine gluconate soap had reduced the risk of hospital-acquired *S. aureus* infections. Hospital stay was also reduced by 2 days. For *S. aureus* carriers, the rapidity of this assay may allow this treatment to be initiated soon after hospital admission and may therefore reduce the hospital-acquired *S. aureus* infections.

Chlorhexidine-alcohol *versus* povidone-iodine for surgical-site antisepsis. NEJM 2010; 362: 18–26

Twenty-seven million operations are performed in the United States each year, and of these, surgical-site infections occur in 300,000–500,000 patients. Because a major source

of pathogens is skin, proper preoperative skin antisepsis is crucial to minimize postoperative infections.

The main objective of this large, prospective randomized trial was to determine whether preoperative skin cleansing with chlorhexidine–alcohol is more protective against infection than treatment with povidone–iodine. All patients received systemic antibiotics preoperatively.

Patients (n = 849) undergoing clean-contaminated surgery in six hospitals were randomized to receive preoperative skin preparation with either chlorhexidine–alcohol scrub or povidone–iodine scrub and paint. The incidence and type of surgical-site infection occurring within 30 days after surgery were recorded. The relative risk of surgical site infection among patients who received clorhexidine–alcohol scrub *versus* povidine–iodine was 0.59 (95% CI, 0.41–0.85).

	Chlorhexidine–Alcohol (n = 409)	Povidone–Iodine (n = 440)	*P* Value
Baseline characteristics			
Age, mean yr ± SD	53.3 ± 14.6	52.9 ± 14.2	0.40
Abdominal surgery, %	72.6	70.0	0.41
SSI, %	9.5	16.1	0.004
Superficial incision	4.2	8.6	0.008
Deep incision	1.0	3.0	0.05
Sepsis from SSI	2.7	4.3	0.26
Organ space	4.4	4.5	> 0.99
SSI by surgery type, %			
Abdominal surgery	12.5	20.5	—
Nonabdominal	1.8	6.1	—

SSI = surgical-site infection.

Interpretation

For clean-contaminated surgery, surgical-site infection was significantly reduced in patients who received chlorhexidine–alcohol compared with 10% povidone–iodine skin preparation. Improving skin antisepsis can decrease skin and deep surgical-site infections but not organ infections.

Treatment of postpartum hemorrhage with sublingual misoprostol *versus* oxytocin in women not exposed to oxytocin during labor: A double-blind, randomized, noninferiority trial. Lancet 2010; 375:210–6

Treatment of postpartum hemorrhage with sublingual misoprostol *versus* oxytocin in women receiving prophylactic oxytocin: A double-blind, randomized, noninferiority trial. Lancet 2010; 375:217–23

Postpartum hemorrhage (PPH) is a major contributor to maternal morbidity and mortality worldwide, and the risk of dying is 100 times higher in developing countries likely because of limited skilled personnel, uterotonic drug access, and other resources. Currently, oxytocin is the accepted standard of treatment for PPH; however, it is difficult to store and administer in resource-poor settings. Another uterotonic agent, misoprostol, is a low-cost and easy-to-use alternative.

These two double-blind, large, randomized, multicenter trials compared the effects of oxytocin and misoprostol in postpartum women who were or were not exposed to oxytocin during labor in Egypt, Turkey, and Vietnam. After diagnosis of PPH and randomization, patients received either 40 IU oxytocin intravenously or 800 μg misoprostol sublingually and placebo for the other treatment (*i.e.*, saline placebo pills or intravenously administered saline). The primary outcomes were the proportion of women who stopped bleeding within 20 min of treatment and those with more than 300 ml blood loss after treatment. Active bleeding was controlled within 20 min in the majority of patients regardless of the treatment group (see table on next page).

Interpretation

PPH is a major risk of death. Although oxytocin is the drug of choice, it is difficult to store, requires personnel for administration, and requires intravenous access. Misoprostol is inexpensive, stable at room temperature, and can be administered sublingually. In these two studies, misoprostol was shown to be effective in controlling postpartum bleeding and an alternative to oxytocin for the treatment of primary PPH after oxytocin prophylaxis during the third stage of labor. Sublingually administered misoprostol could reduce worldwide maternal mortality from PPH.

Critical Care Medicine

Jean Mantz, M.D., Ph.D., Editor

Red blood cell transfusion is associated with infection and extracerebral complications after subarachnoid hemorrhage. Neurosurgery 2010; 66:312–8

It is unclear at what degree of anemia, red blood cell transfusion should be recommended for patients in intensive care units. An association between red blood cell transfusion and poor clinical outcome has been demonstrated in multiple clinical trials. This may also affect the outcomes of patients with subarachnoid hemorrhage.

This retrospective analysis from a prospective observational database at a level I trauma center examined the interaction between red blood cell transfusion and medical complications in patients with subarachnoid hemorrhage. Patients with grade I–V subarachnoid hemorrhage, at least one confirmed aneurysm, surgical occlusion of the ruptured aneurysm, and intensive care unit stay for more than 24 h, were included.