Electrophysiological studies of the heart became commonplace in the past decade. Like cardiac catheterizations, electrophysiological studies are often considered “same day” procedures; patients are admitted in the morning, undergo the procedure, recover for several hours while confined to bed, and then are discharged from the hospital. The requisite time in bed varies widely between institutions where electrophysiological studies are performed. Little has been published about the optimal time that patients should remain in bed.

**Objective** To determine if the requisite time in bed could be safely reduced by 2 hours for patients recovering from electrophysiological studies done via a femoral venous approach.

**Methods** An experimental-control group design was used. A total of 68 patients were randomized to 2 hours (n = 31) or 4 hours (n = 37) of bed rest. Groups were comparable in age and sex. Both groups were observed for 5 hours after the procedure.

**Results** The incidence of bleeding did not differ significantly between the experimental and control groups. Bleeding occurred in only 1 patient.

**Conclusions** The required 4 hours of bed rest after an electrophysiological study done via a femoral vein approach can safely be reduced to 2 hours. Early ambulation has implications for decreasing the cost of nursing care after the procedure and decreasing length of hospital stay, thus optimizing utilization of beds for recovery. (American Journal of Critical Care. 2004;13:56-58, 87)
Background

This study is the fourth in a series of investigations on the length of time that patients should be restricted to complete bed rest after invasive cardiac procedures in which a femoral arterial or venous approach is used. The first 2 studies (Time-in-Bed Studies [TIBS] I and II) focused on patients who had undergone diagnostic coronary arteriography.2,3 The third focused on patients undergoing percutaneous transluminal coronary angioplasty.4 The findings of these prospective experimental clinical studies indicated that reducing time in bed from 12 hours to 6 hours (TIBS I) and subsequently from 6 hours to 4 hours (TIBS II and III) after invasive cardiac procedures in which a femoral artery approach is used is safe and effective. Patients who were randomized to the group in which the time they were required to remain in bed was reduced did not experience an increase in bleeding from the femoral artery access site. Moreover, patients were extremely satisfied with the fact that they were allowed to get out of bed earlier.2-4

When this study (TIBS IV) was undertaken, patients who underwent electrophysiological studies (via a femoral venous approach) at the University of Virginia Medical Center were also required to remain in bed for 4 hours after the procedure. Although clinicians understood that the rationale for restricting movement and confining patients to bed rest after the procedure is to prevent bleeding from the catheter insertion site, clinicians caring for these patients questioned why patients undergoing electrophysiological studies (who have a diagnostic procedure via a femoral arterial approach) had to remain in bed as long as patients who have undergone cardiac catheterization or percutaneous transluminal coronary angioplasty in which an arterial approach is used.

Purpose

The purpose of this study was to determine if requisite time in bed could be safely reduced by 2 hours for patients recovering from electrophysiological studies in which a femoral venous approach was used. The following 3 hypotheses were evaluated:

1. The incidence of bleeding from the femoral catheter insertion site will not differ significantly between the group of patients who remain in bed for 2 hours (experimental group) and the group of patients who remain in bed for 4 hours (control group) after sheath removal following diagnostic and interventional electrophysiological studies via a femoral venous approach.

2. Patients in the experimental group will require significantly fewer doses of analgesics for lower back or leg pain after the procedure than will patients in the control group.

3. Patients in the experimental group will express greater satisfaction with time-in-bed requirements after the procedure than will patients in the control group.

Methods

After approval was received from the Human Investigation Committee, the study was conducted from October 1998 to December 2000 in the electrophysiology center of the University of Virginia Medical Center. A prospective experimental-control group design with randomization of subjects was used. After running a power analysis based on the known incidence of bleeding complications after the procedure to date (<0.2%), we determined that thousands of patients would have to be enrolled in this study to achieve a moderate effect size. The infeasibility of this number, coupled with the fact that we do time-in-bed studies at this institution and realized that we could not arbitrarily change practice in this regard, led us to undertake a pilot study with far fewer subjects than would be required if we were to follow the rationale based on the power analysis. Therefore, we decided to enroll 60 to 100 patients in the pilot project. A convenience sample was used. Each subject was asked to provide written informed consent before undergoing the electrophysiological study. Sheaths used were 8F or smaller. Exclusion criteria included sheath size greater than 8F, a technically difficult venous access, known bleeding disorder, the need for arterial puncture during the procedure, and procedure-related complication. Patients were randomized to a period of either 2 hours (experimental group) or 4 hours (control group) of bed rest after sheath removal.

Study Protocol

Procedural sedation included midazolam 1 mg intravenously every 10 to 15 minutes in the first hour and fentanyl 50 µg every 1 to 15 minutes until the patient was sleepy but still able to respond to questions. Once hemostasis was established after the procedure, all patients had gauze dressings in place over the catheter insertion site. Blood pressure, heart rate, and oxygen saturation were monitored continuously in the electro physiology laboratory. Patients remained in bed until hemostasis was assured and the gauze dressings were removed. The nurses providing bedside care used the nursing assessment tool (NAT) to assess patients’ needs for comfort and medication. Continuous monitoring of the patients was performed by each nurse until the patient was able to ambulate safely. The patients were then able to move around freely as long as they were able to ambulate without assistance. This method of care was in keeping with the American College of chest physicians’ guidelines for care and use of the intensive care unit. Once the patient was able to use the bathroom, the patient was allowed to get out of bed.
insertion site in the femoral vein and were instructed to keep the affected leg extended while in bed. Patients were allowed to have the head of the bed elevated at an angle of 30° to 45° during the period of bed rest. Pressure dressings and sandbags were not used. The protocol for pain management after the procedure included orders for either 650 mg acetaminophen as needed for pain or 1 to 2 tablets of oxycodone (5 mg) plus acetaminophen (325 mg) as needed for pain. Both groups were observed for a total of 5 hours after sheath removal and were assessed by the researcher (S.G.) for the incidence of bleeding, hematoma formation, and the use of analgesics for back or leg pain. The criteria for observation have been described in previous studies. The criteria for observing the clot after vomiting. The patient was returned to bed and was treated with direct manual pressure to the groin site for 10 minutes. Hemostasis was achieved, and she remained in bed for an additional 2 hours. The remainder of her hospital stay was uneventful.

No hematomas developed in either group. Use of analgesics after the procedure did not differ significantly between the 2 groups. Patients’ satisfaction scores did not differ significantly between those who remained in bed for 2 hours after the procedure and those who stayed in bed for 4 hours.

**Discussion**

This study indicated that compared with keeping patients in bed for 4 hours after electrophysiological studies, allowing patients to get out of bed after only 2 hours of bed rest after the procedure did not result in an increased incidence of bleeding from the femoral vein puncture site. As in previous studies, the single incident of bleeding occurred in an elderly woman. In this instance, it was related to the stress of vomiting. This finding is consistent with those of Johnson et al, who noted that hemorrhage occurred most often in females and in patients more than 60 years old. (The difference, however, was that Johnson and colleagues were reporting on bleeding episodes that occurred after cardiac catheterization, which involves an arterial approach).

Only 2 patients in the control group and 1 patient in the experimental group required analgesics for back or leg pain after the procedure. These low numbers can be explained by the fact that patients in both groups may have had residual analgesic effects from the repeated doses of fentanyl administered during the procedure.

As for the patients’ satisfaction scores related to time in bed after the procedure, patients often rated their overall satisfaction with the care they had received while they were in bed, rather than rating their satisfaction with the length of time itself. For example, patients would rate their satisfaction as 4 and comment that the care they received “during the entire procedure and after the procedure” had been “wonderful.”

On the basis of this study, it was determined that the institutional standard of requiring 4 hours of bed rest after electrophysiological studies via a femoral vein approach could safely be reduced to 2 hours. Early ambulation has implications for decreasing the cost of nursing care after procedures and decreasing length of hospital stay, thus optimizing utilization of beds for recovery. Further decreases in requisite time in bed after invasive cardiac procedures may be safe and effective in the future as new devices for closure of arterial and venous punctures (such as the SyvekPatch®) facilitate hemostasis at the vascular access site.

**Use of 2 hours of bed rest after femoral venous stick is safe and may reduce cost, decrease length of stay, and improve bed utilization.**

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REFERENCES

Time in Bed After Electrophysiological Procedures (TIBS IV): A Pilot Study
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