Use of the Swan-Ganz Catheter in a Community Hospital

To the Editor:

During the last 9 years, attempts have been made to analyze usefulness and appropriate indications for utilization of Swan-Ganz catheters. The use of a pulmonary artery flotation catheter (PAC) has remained a standard tool in management of critically ill patients in the United States.

A recent study showed rather poor documentation of data collected with Swan-Ganz catheters. The initial central venous pressure, right atrial pressure, pulmonary artery pressure, and pulmonary artery occlusion pressure were documented in 87% of all cases. Initial complete hemodynamic values, including cardiac output, systemic vascular resistance, and pulmonary artery occlusion pressure were obtained within 24 hours of placement of the catheter in 59.8% of cases. Also, therapeutic decisions attributable to PAC placement occurred in 37% of cases within 24 hours after catheter insertion, and in 10% intervention occurred within 24 to 48 hours of insertion. For more than half of the patients, data obtained did not result in any documented change of treatment.

We analyzed retrospectively utilization of PAC in our hospital for 6 months, from January to June of 1994 (Table 1). We limited number of diagnoses to heart failure, sepsis, respiratory failure, and fluid management/diagnostic. We eliminated procedures done by anesthesiologists during or before surgery, and we attempted to study 50 charts, yet only 43 became available.

Table 1—Patient Characteristics and Indications for PAC Insertion

<table>
<thead>
<tr>
<th>Indications</th>
<th>Number of patients</th>
<th>No change in treatment</th>
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<tbody>
<tr>
<td>Heart failure</td>
<td>29 (67%)</td>
<td>8 (27%)</td>
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<tr>
<td>Sepsis</td>
<td>5 (12%)</td>
<td>1 (20%)</td>
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<tr>
<td>Respiratory failure</td>
<td>3 (7%)</td>
<td>1 (33%)</td>
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<tr>
<td>Fluid management and diagnostic</td>
<td>6 (14%)</td>
<td>3 (50%)</td>
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Our criteria for therapeutic intervention were (1) increase or decrease of intravenous fluids rate by more than 100 mL/h; (2) initiation or discontinuation of therapy with inotropic agent; and (3) initiation of ultrafiltration or hemoﬁlum.

Our analysis showed that initial central venous pressure, pulmonary artery pressure, and pulmonary artery occlusion pressure were documented in all cases. Initial complete set of hemodynamics was obtained within 24 hours of placement in 40 cases (93%), in 2 cases (4.7%) these values were never recorded, and in 1 case (2.35%) they were obtained later than 48 hours after PAC placement. Therapeutic consequences from PAC data measurement occurred in 50 cases (70%) within 24 hours, and in 13 cases (30%) data obtained did not result in any attributable change of treatment. Catheter insertion complication occurred in 1 patient (2.35%); line sepsis did not adversely affect the outcome.

Concluding, we found that in our hospital the initial set of hemodynamics was documented in 100% of cases as opposed to 87%; this could possibly be explained by more detailed protocols and availability of bedside computers for data recording and calculation. We also found that insertion of PAC lead to more therapeutic interventions, (70 vs 47%). Lastly, we found that detailed hemodynamic values, i.e., cardiac output, cardiac index, and peripheral vascular resistance were recorded at our hospital within 24 hours after insertion in 93% of cases vs 59.8%. These data represent improved utilization of Swan-Ganz catheters at our hospital. We acknowledge the limitations of our study: number of patients (43), and exclusion of surgical and anesthesia patients. Furthermore, our data was retrospectively analyzed. Even with all this in mind, we would like to conclude that utilization of pulmonary artery catheters can fairly easily be improved.

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REFERENCES


Criteria for Pulmonary Thromboendarterectomy

To the Editor:

My associates and I read with interest the report by Simonneau et al (CHEST 1995; 107[suppl]:528–555) regarding their experience with chronic thromboembolic pulmonary hypertension. However, several of their speculative comments are misleading and merit comment.

They report a higher incidence of coagulopathies than we have found in our series that now extends to some 600 patients. This difference is not explained by the authors’ inference that such studies were not done in our patients. Antithrombin III, protein C, protein S, and lupus anticoagulant have been sought in some 500 patients. We still find a lupus anticoagulant in some 10% of patients; the others (combined) in less than 5%. Thus, the difference is not explained by omission of such studies. More recently, we have added resistance to activated protein C to our test battery.

More important, however, is the difference in—and reasons for—the number of patients who undergo thromboendarterectomy on referral: a surprisingly low 11/72 (15%) at their institution vs 90% at the University of California at San Diego. Their suggestion that patients referred to San Diego are somehow “preselected” for surgery is incorrect and, unfortunately, misleading. They stated that they reject patients because thrombi were “considered too distal” or “patients were too severely compromised.”

We do not reject patients based on severity of compromise. Many are in severe right ventricular failure and have been for many months. Further, while we prefer patients not to have comorbid disease, a number do (particularly coronary artery disease). Morbidity increases risk, as is discussed with each patient.

Therefore, we can conclude only that the criteria of Simonneau et al for “severity” or thrombi that are “too distal” must differ from ours. Regarding the latter, we have operated on many patients whose thrombi were considered “too distal” elsewhere. We consider that some combination of angiographic interpretation, the availability of angioscopy to us, and the extensive experience of our surgical colleagues explains the striking divergence in operability. These three elements have “converted” many of our patients from “inoperable, too distal” elsewhere to “operable” at our institution. The impact of the “learning curve” on such decisions is substantial.

Operability at our institution also is conditioned by our assessment of expected outcome. Our goal, of course, is to return patients to a normal, or near-normal, hemodynamic status. Yet, we do