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A survey of American College of Surgery fellows evaluating their use of antibiotic prophylaxis in the placement of subcutaneously implanted central venous access ports

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Abstract

BACKGROUND: Currently, there is no standard of care for prophylactic antibiotics (PABX) at the time of placement of fully implanted central venous access ports (CVAPs). A survey of fellows of the American College of Surgeons was undertaken to determine the current practice pattern of PABX in CVAP placement.

METHODS: A survey was mailed to 5,000 fellows of the American College of Surgeons.

RESULTS: The response rate was 21.7%, with 73.1% of respondents nonacademic surgeons. PABX were given by 88.2% of the respondents. Of those who did not use PABX, the primary reasons were "not justified" or "not standard of care." General comments regarding reasons for use of PABX included "medicolegal," "required by hospital," and "liability."

CONCLUSIONS: In this survey, the overwhelming majority of responding American College of Surgeons fellows indicated that they use preoperative antibiotic prophylaxis for CVAP placement, despite there being no accepted standard of care or definitive evidence regarding PABX use for fully implanted CVAPs.

Fully implanted venous access devices have become widely used for central venous access. In the United States alone, >15 million central venous access cases are performed annually.[1,2] Despite the prevalence of this procedure, the use of antibiotic prophylaxis for these implanted devices remains controversial. Although antibiotic prophylaxis for most implanted orthopedic and cardiac devices is a well-established standard of care, there is currently no standard of care regarding antibiotic prophylaxis for fully implanted central venous access devices.[3–5] A systematic Cochrane review of 4 randomized, controlled trials (RCTs) showed no decrease in catheter-related infection (CRI) rates when antibiotics were administered at the time of insertion.[6,7] However, these 4 trials did not analyze fully implanted devices but only externally tunneled central venous catheters, known to have a continual risk for skin flora exposure. Other uncontrolled, confounding variables in these 4 trials were the timing of the first access, dressing management, and flush protocols.

In a 2010 retrospective review from our institution, Scaife et al[8] reported on 459 patients with fully implanted central venous access ports (CVAPs) for chemotherapy, showing a decreased rate of infection in those patients treated with antibiotic prophylaxis, but the difference did not

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reach statistical significance. On the basis of this slight decrease in the already low rate of CVAP-associated infections and the significant associated cost and morbidity of a line infection, it was concluded that prophylactic antibiotics (PABX) should be considered in this population. There have been 2 subsequent RCTs, 1 from Turkey and 1 from Italy, as well as a retrospective review done by interventional radiologists at the Memorial Sloan-Kettering Cancer Center, examining the use of PABX for the placement of CVAPs.[9–11] These series have all concluded that PABX were unnecessary, given the overall low rate of CRI. However, neither of these studies evaluated the impact of the morbidity or cost associated with CRIs.

Despite the conclusions of these studies, we suspected that most practitioners continue to use PABX for CVAP placement, and we therefore chose to evaluate practice patterns regarding PABX use by surveying members of the American College of Surgeons (ACS) who were likely to place CVAPs in their practice.

Methods

A single-page survey (Fig. 1) consisting of 18 questions (14 closed ended and 4 open ended) was created and pretested for clarity of questions and ease of use within our general surgery service by testing surgical faculty members and general surgery residents. The survey was limited to a single page to improve the response rate. It was submitted and approved by our Institutional Review Board.

The ACS was sent a copy of the survey and the institutional review board–approved protocol and then petitioned to provide address information from the ACS database. Only information on ACS fellows most likely to place CVAPs was requested, including general surgery, colorectal surgery, gynecology-oncology, and vascular surgery fellows.

From the list provided by ACS, a total of 20,563 membership addresses were provided, and each was assigned a numeric case value. The list was then sorted by the addressees' state of residence, and representative percentages were calculated for each state. In an attempt to adequately cover the target population, a random number generator (Excel 2007; Microsoft Corporation, Redmond, WA) was used to select a representative sample of 5,000 cases, in which percentages were matched to the statewide distribution per membership. Surgeons on this list were sent a copy of the single-page survey along with the protocol consent form and a stamped return envelope (Fig. 1).

Surveys were mailed in November 2010 and returned through March 2011. Returned surveys were examined for completion, and all surveys with >50% of questions completed were included in the analysis. Respondents who did not insert CVAPs were excluded from analysis.

Relevant data were collected in Excel 2007, and statistical analyses were performed using PASW Statistics version 18 (SPSS, Inc, Chicago, IL). Data are reported as mean ± SD or medians and interquartile ranges as appropriate. Data were analyzed using chi-square analyses and Fisher's exact test with expected values <5. Parametric testing was performed for normally distributed continuous variables and Mann-Whitney *U* tests for variables not normally distributed. *P* values <.05 were considered significant.

Results

Overall survey results

There were 1,091 surveys returned. Excluding 10 returned for incorrect or no forwarding addresses and 11 returned surveys that noted that the respondents were no longer practicing, the evaluable survey response rate was 21.7% (1,080 of 4,979). For complete survey response results, see Table 1. There were respondents from all 50 states and the District of Columbia, plus military members. When the addresses of respondents were broken down into US census regions, there was a response rate of ≥20% from each region (Table 2).

CVAPs were placed by 882 respondents (81.7%), of whom 777 (88.1%) gave PABX, and of those 777, 726 respondents (93.4%) gave PABX in every placement case. There were 790 respondents (73.1%) based in nonacademic practice settings, 262 (24.3%) were in academic settings, and 28 (2.6%) respondents did not answer this question. Significantly more respondents in nonacademic practices placed CVAPs (695 of 790 [88%]) than surgeons in academic practices (176 of 262 [67.2%]) ($P < .001$). The median number of ports placed per year, on the basis of the minimum range that was provided, was 20 (interquartile range, 28). Surgeons who placed CVAPs had been in practice an average of 17.2 ± 8.4 years (range, .4 to 50 years). The left subclavian (SCV) was the favored preferred anatomic CVAP placement site (45.4%), followed by the right SCV (27.8%). Of those who did not use PABX (n = 105) and those who did not use PABX in every case (n = 51), the most common reasons chosen (6 choices) for nonuse were "not justified" or "not standard of care." When a prophylactic antibiotic was used, 738 (68%) respondents' antibiotic of choice was a first-generation cephalosporin.

Antibiotic use

Practitioners who place CVAPs in clinics or minor procedure rooms were less likely to use PABX for CVAP placement. Additionally, surgeons who preferred the SCV over the internal jugular vein (IJV) were less likely to use PABX. All other factors evaluated, including type of practice, years in practice, and estimated CRI rate, did not affect the rate of use of PABX (Table 3).

Infection rate

The definition of CRI provided in the survey questions was "induration in the operative site that resulted in