

TITLE: ANTIMICROBIAL THERAPY AND THE ANESTHESIOLOGIST

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INTRODUCTION

The number of antimicrobial agents has markedly increased over recent years. The anesthesiologist is often responsible for administering antibiotics in the perioperative period. This study examines the frequency that anesthesiology residents give antibiotics, the types of antibiotics given, their training in antibiotic infusion, and their knowledge of potential complications.

METHODS

A representative sample of anesthesiology residents were randomly and individually questioned on 1) the frequency in which they administered antibiotics, 2) if they gave a certain antibiotic, would they give it as a bolus (in less than 10 minutes) or by infusion (over 30 or more minutes), 3) why the drugs were given as a bolus or infusion, and 4) how they were instructed in antibiotic delivery.

Operating room records for two months were reviewed for the number of anesthetics delivered, the number of patients who received perioperative antibiotics, and the antibiotics most frequently used.

RESULTS

The anesthesiology residents estimated they gave 64 percent of their patients antibiotics. Table 1 notes the antibiotics used (chart review) and how they were generally given (survey). Seventy percent gave no specific reason for choosing a specific administration technique, eight percent indicated an allergic reaction was a concern, and 22 percent gave specific occurrences to monitor such as hypotension, toxicity, and skin reaction. The interaction with neuromuscular blockers was never mentioned by the residents.

The residents' main source of training in the administration of antibiotics was anesthesiology faculty or other residents (Table 2). Over thirty-two percent reported they had received no training in antibiotic administration.

DISCUSSION

The multiplicity of drugs taken before surgery and the number the anesthesiologist administer intraoperatively increase the likelihood of adverse drug effects. The anesthesiologist is responsible for antibiotic administration in a significant number of patients. Unfortunately, anesthesiologists are often unaware of potential problems that can occur with inappropriate antibiotic administration such as allergic reactions (hypotension, bronchospasm, rash), prolongation of neuromuscular block, electrolyte imbalance, and end-organ damage (renal failure, colitis, ototoxicity). Patient safety can be improved by increased education of anesthesiology residents in the use of antibiotics. This may be accomplished by increasing the awareness of staff anesthesiologists, having educational sessions, and emphasizing the topic during ICU rotations.

TABLE 1. Frequency and Methods of Administering Antibiotics

	Penicillin & Derivatives	Cephalosporins	Aminoglycosides	Vancomycin	Clindamycin
Frequency used (%)	16	66	14	1	2
Method of Infusion	34	35	64*	77*	45*
Delivery (%) Bolus	35	39	10	0	16
(*-Appropriate) Both	31*	26*	26	23	39

TABLE 2. Anesthesiology Residents' Source of Training in the Administration of Antibiotics

Source of Training	Percent
Anesthesiology faculty	35.5
Another resident	19.4
Pharmacist	6.4
Other	6.4
No training	32.3

TITLE: INTRAOPERATIVE COMPLICATION RATES: THE INFLUENCE OF ASA PHYSICAL STATUS, AGE, SEX, RACE AND BODY MASS INDEX

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Data on 26,169 patients (1986-1989) was analyzed to determine the influence of ASA physical status (I-IV) age, sex, race (black or white), and body mass index (BMI) (weight (Kg)/height (m)²) on intraoperative complication rates (IOC). Complications were categorized in four groups: cardiac (C), respiratory (R), metabolic (M) and other (O). A case was considered as having a complication if the primary anesthesiologist identified one or more problems within the category. Specific complications were investigated within each category. Logistic regression, parameterized with first-order and crossproduct terms was used for patients factors and IOC for the four groups. Loglikelihood-ratio statistic was used for importance of each factor. Significance = P<0.05.

Results: IOC rates and p-values are shown (Table). An increase in ASA and AGE was associated with a significant increase in all four categories (C,R,M,O). Increasing BMI was associated with a significant increase in R and a decrease in M. C and M rates were significantly higher for black patients than for white patients. Finally,

females had a higher R rate than did men. Hypertension (6.0%) and hypotension (5.8%) were most common in C; "difficult intubation" (3.0%) in R; hypothermia (<35C)(4.0%) in M. Rank order of significance was ASA>AGE>(BMI and Race)>SEX. **Discussion:** Rates varied widely from the mean depending on patient factors. Rate comparisons between individuals and institutions should reflect the influence of these patient factors.

INTRAOPERATIVE COMPLICATION RATES (%) BY CATEGORY

		Cardiac	Resp	Meta	Other
MEAN	RATE	14.90%	6.74%	4.87%	3.52%
ASA	HIGH	p<.001	p<.001	p<.001	p<.001
		4.24	4.83	2.44	1.60
	LOW	31.75	7.39	9.92	9.83
AGE	LOW	p<.001	p<.001	p<.001	p=.037
		4.93	5.41	2.65	0.7
	HIGH	26.92	8.45	6.60	4.96
BMI		p=.455	p<.001	p<.001	p=.309
	0-25	13.86	5.77	5.56	3.56
	25-30	15.53	7.08	4.26	3.58
	>30	16.69	8.71	3.95	3.35
RACE		p<.001	p=.143	p<.001	p=.175
	B	15.78	7.05	5.18	3.25
	W	14.24	6.50	4.63	3.73
SEX		p=.233	p=.037	p=.300	p=.505
	M	14.26	6.50	4.81	3.53
	F	15.62	7.01	4.93	3.52