

Perioperative Use of Acetaminophen Suppositories

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Introduction: Acetaminophen is a popular nonnarcotic analgesic used widely in the perioperative period for the management of pain in pediatric patients. The drug has been extensively studied for its efficacy and safety. However, controversy still surrounds the acetaminophen suppository and its use in pediatric patients. Our goal in undertaking this study is to investigate the composition and philosophies surrounding the use of acetaminophen suppositories.

Methods: After obtaining IRB approval, the research was divided into three parts: 1) analysis of the homogeneity of acetaminophen in the suppository, 2) analysis of suppository samples from ten different pediatric anesthesiologists and 3) a survey of pediatric anesthesiologists. Three sets of 80 mg, 120 mg and 325 mg were selected. Each set contained two samples of each dose. The first set was divided along the longitudinal axis, the second set was divided along the vertical axis and the third set was divided into three parts along the longitudinal axis. Each sample was stored in a plastic bag at room temperature and later analyzed. In addition, 10 pediatric anesthesiologists were chosen to physically alter acetaminophen suppositories in order to achieve one-half and two-thirds the dose of an 80 mg, 120 mg and 325 mg suppository. Each pediatric anesthesiologist was given two sets of three samples each of 80 mg, 120 mg and 325 mg rectal acetaminophen. The only stipulation during the trial was to alter the drug according to their clinical practice; otherwise there were no restrictions to the method employed for the alteration of the rectal acetaminophen. Finally, a survey was conducted among 42 pediatric anesthesiologists concerning their understanding of the homogeneity of rectal acetaminophen and its impact on their clinical practice.

Results: The laboratory evaluation of rectal acetaminophen in 80mg, 120 mg and 325 mg doses supports the concept of a uniform distribution of acetaminophen. Each portion of the sample was weighed and converted to a percentage of the whole. Next, each portion was analyzed for acetaminophen and the dose converted to a percentage of the total dose. The percentages of weight versus concentration of acetaminophen were next compared and found to be similar in all sets of the various doses. (Fig. 1) The alteration of rectal acetaminophen by the pediatric anesthesiologists resulted in a wide range of values. (Fig 2) Of the 29 completed surveys, 15/29 anesthesiologists believe there is uniform distribution of acetaminophen. 11/29 anesthesiologists consider alteration of suppositories to be accurate. However, the majority of anesthesiologists (18/29) feel alterations are inaccurate. In addition, among those anesthesiologists who do not alter the suppository, 1 believe there is an uneven distribution of acetaminophen.

Conclusions: The clinical practice of altering rectal acetaminophen is a daily occurrence in many hospitals. Although much has been published about acetaminophen, information concerning the actual clinical use of rectal acetaminophen has been lacking in the anesthesia literature. Based on our research, it appears acetaminophen is uniformly distributed in the vegetable oil matrix. The notion of an uneven distribution of acetaminophen has been previously cited from a personal communication and never scientifically examined. (1) The lack of accuracy and precision of the pediatric anesthesiologists in altering the suppositories make for a compelling argument to restrict the delivery of rectal acetaminophen to unaltered suppositories or have the pharmacy custom tailor the rectal acetaminophen. The wide range of under dosing and, in particular, overdosing may have significant impact not only on pain control, but liver toxicity. Finally, whether the pediatric anesthesiologist does or does not alter suppositories appears to be based on opinion and hearsay, instead of scientific fact. (Key words: Analgesics: acetaminophen. Anesthesia: pediatric. Administration: rectal. Toxicity: overdose.)

Refs:

1. Birmingham P.K. et al., Anesthesiology 1997

Figure 1

80 mg	% wt	% dose	120 mg	% wt	% dose	325 mg	% wt	% dose
top	38%	38%	top	51%	51%	top	29%	28%
bottom	62%	62%	bottom	49%	49%	bottom	71%	72%
top	35%	34%	top	56%	55%	top	70%	69%
bottom	65%	66%	bottom	44%	45%	bottom	30%	31%
head	61%	66%	head	47%	44%	head	56%	55%
tail	39%	34%	tail	53%	56%	tail	44%	45%
head	51%	53%	head	52%	52%	head	42%	45%
tail	49%	47%	tail	48%	48%	tail	58%	55%
head	36%	36%	head	37%	37%	head	35%	36%
mid	36%	37%	mid	30%	31%	mid	37%	38%
tail	29%	27%	tail	33%	32%	tail	27%	26%
head	33%	33%	head	28%	27%	head	44%	43%
mid	36%	36%	mid	33%	35%	mid	30%	30%
tail	31%	31%	tail	39%	37%	tail	26%	27%

Figure 2

