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Washington University Emergency Medicine Journal Club
Prophylactic Antibiotics in Anterior Nasal Packing for Epistaxis

Vignette

You are working in your community emergency department (ED) one winter afternoon when you encounter Mr. D. He is a 64 year old gentleman with a history of hypertension, who takes amlodipine and a daily 81 mg aspirin. He presents with one hour of continuous right-sided epistaxis. You have him blow his nose to evacuate all of the clot and spray phenylephrine in both nares. You take two cotton-balls, soaked in a mixture of phenylephrine and viscous lidocaine, and place one in each anterior nasal cavity. You then apply a nose clip and leave him alone for 20 minutes.

When you return and remove the cotton-balls, intent on cauterizing the offending area with silver nitrate, you find that there is still a continuous ooze from the right anterior septal mucosa that is too brisk to allow for cautery. You bite the bullet and grab a 5.5 cm Rapid-rhino and insert this in the right nare. After inflating the balloon, you find that you have achieved good hemostasis. You call your on-call ENT to arrange a follow-up appointment in the next 2-3 days for removal of the Rapid-rhino and further assessment of the epistaxis. The ENT agrees to see the patient, and at the end of the call reminds you to send the patient home on oral antibiotics until follow-up. You send the patient home with a prescription for amoxicillin-clavulanic acid.

You are back working again 4 days later, when Mr. D returns to the ED. His nasal packing was removed the day prior without incident and a small area in his nasal mucosa was cauterized successfully by the ENT physician. Mr. D is presenting now with horrible diarrhea and abdominal cramping. As you leave the room and get ready to order a C. diff toxin screen for his stool, you wonder if it's really worth putting patients with anterior nasal packing on prophylactic antibiotics, given the adverse symptoms often encountered. You decide to check the literature when you get off work.

PICO Question
Population: Adult patients with anterior nasal packing in place for epistaxis
Intervention: Prophylactic systemic oral antibiotics
Comparison: None
Outcome: Toxic shock syndrome, sinusitis, otitis media

Search Strategy

You search PubMed using the terms "epistaxis AND antibiotics," and identify 200 articles, 3 of which are most relevant to the PICO question (http://tinyurl.com/kcptxrh). Unable to find a 4th article specifically addressing antibiotics in nasal packing for epistaxis, you instead choose an article from the bibliography of one of the selected articles that addresses antibiotic use following septoplasty.

Article 1: Ricci G, D'Ascanio L. Antibiotics in septoplasty: evidence or habit? Am J Rhinol Allergy. 2012 May-Jun;26(3):194-6. Answer Key.

Article 2: Biswas D, Mal RK. Are systemic prophylactic antibiotics indicated with anterior nasal packing for spontaneous epistaxis? Acta Otolaryngol. 2009 Feb; 129(2):179-81. Answer Key.

Article 3: Pepper C, Lo S, Toma A. Prospective study of the risk of not using prophylactic antibiotics in nasal packing for epistaxis. J Laryngol Otol. 2012 Mar; 126(3):257-9. Answer Key.

Article 4: Biggs TC, Nightingale K, Patel NN, Salib RJ. Should prophylactic antibiotics be used routinely in epistaxis patients with nasal packs? Ann R Coll Surg Engl. 2013 Jan;95(1):40-2. Answer Key.

Bottom Line

Epistaxis is a common problem, with a lifetime incidence of approximately 60% (Gifford 2008). While the majority of cases do not require medical attention, epistaxis remains a common chief complaint in the ED. The management of epistaxis is highly variable, with a wide range of packing implements and hemostatic agents currently available. In one survey of otolaryngologists in England and Wales, over three-fourths of patients admitted to the hospital for epistaxis required nasal packing, with anterior packing employed in the vast majority of these cases (Kotecha 1996). While the use of nasal packing has likely decreased since this study's publication, and is likely much lower when considering all patients presenting to the ED, anterior packing remains a common procedure for emergency physicians.

The role of prophylactic systemic antibiotics when anterior nasal packing is employed remains highly controversial. The authors of the American College of Emergency Physician's Focus on Treatment of Epistaxis note that while direct evidence is lacking, "most sources recommend TMP/SMX, cephalexin, or amoxicillin/clavulanic acid to prevent sinusitis and toxic shock syndrome [TSS]." While the prevention of toxic shock syndrome is often cited as a reason for prescribing antibiotics in these cases, this serious complication is exceedingly rare. The incidence of TSS following nasal surgery is approximately 16.5 in 100,000, or 1 in approximately 6000 cases. While the exact incidence of TSS following anterior nasal packing in epistaxis is unknown, no cases have been reported in the literature.

Of 61 cases of TSS identified in the Minneapolis-St. Paul area between 2000 and 2006, none were attributed to an upper respiratory source (Devries 2011).

A survey of physicians in the United Kingdom conducted in 2005 revealed that 78% of interviewees believed that the use of prophylactic antibiotics with anterior nasal packing reduced the incidence of infection (Biswas 2006). There is, however, limited evidence regarding the effect of antibiotics on the infectious complications of packing. One large randomized trial evaluating the use of prophylactic antibiotics with nasal packing following septoplasty found no difference in post-operative pain, infectious symptoms, or the amount of purulent nasal discharge with or without prophylactic antibiotics (Ricci 2012). These results support the findings of a previous systematic review of post-operative nasal surgery patients (Georgiou 2008); however, their applicability to patients with anterior nasal packing for epistaxis is unclear. While differences in packing location (anterior vs. posterior), sterility of the environment (operative room vs. ED), and the nasal cavity itself (post-surgical vs. non-instrumented) may have some effect on the incidence of infectious outcomes, it seems reasonable to extrapolate these results to our patient population.

Unfortunately, no randomized controlled trials evaluating the effect of antibiotics on outcomes following epistaxis could be identified. What evidence does exist, however, suggests that antibiotics are unnecessary and potentially harmful. Anterior nasal packing and antibiotic administration have been found to have no effect on the microbiological flora of the nasal cavity following epistaxis (Biswas 2009). Two before and after studies evaluating changes in protocol, with a move away from the use of routine prophylactic antibiotics, also found that antibiotics had no affect on more clinically important patient outcomes. The first of these studies (Pepper 2012) enrolled 159 patients, of whom approximately half were treated with prophylactic amoxicillin-clavulanic acid or clarithromycin while the other half received no antibiotics. No infectious complications (sinusitis, otitis media, or TSS) were identified in either group. In the latter study (Biggs 2013), 38 patients were enrolled prior to the implementation of a protocol to reduce antibiotic use, while 19 patients were enrolled following implementation. The rate of antibiotic use was significantly reduced by the protocol, from 74% to 16%. The authors found no difference in infectious symptoms between the groups at 6-week telephone follow-up.

Unfortunately, none of these studies assessed adverse reactions to the antibiotics administered. Rates of serious adverse reactions to antibiotics can be difficult to estimate. One report estimates the rate of anaphylaxis from antibiotic administration to be around 1 in 5000, somewhat lower than the 1 in 6000 rate of TSS in nasal packing following nasal surgery. Assuming a similar rate of TSS following anterior packing in epistaxis, and assuming that antibiotics completely eliminated its occurrence, the benefit would still be outweighed by the risk of serious harm. While this analysis does not account for other infectious complications - such as sinusitis and otitis media - it also does not account for other serious complications of antibiotic use - such as Stevens-Johnson syndrome and *Clostridium difficile* infections - or other less serious adverse reactions - such as rash,

diarrhea, nausea, and vomiting. Given the low reported incidence of sinusitis and otitis media in the literature following nasal packing, it seems highly likely that the risks of antibiotic administration would outweigh the benefits when all complications are considered. Unfortunately, the rarity of both infectious and drug-related complications mean that large sample sizes would be required to definitively demonstrate the superiority of either treatment option, and such a study seems unlikely to occur in the near future.

The current literature on this topic is unfortunately lacking in both methodology and sample size, and it is difficult to make firm conclusions. This conundrum is common, and the typical question remains: "What amount of evidence is required to change our practice?" Given that our "standard of care" is to administer prophylactic antibiotics when we place anterior packing in the ED, and that this is frequently the recommendation of our ENT consultants, some would argue that rigorous evidence is needed before we can safely advocate for a change in practice. In the parlance of our legal system, we would need to prove "beyond a reasonable doubt" that the risks of antibiotic administration outweigh the benefits. I would instead argue that a civil (rather than criminal) burden of proof applies, and that we need merely prove our case "by a preponderance of the evidence." As is often the case, our current practice and our colleagues' usual recommendations are based on anecdote and dogma, rather than on sound research and data. Given the very real potential for harm with unnecessary antibiotic administration, the current body of evidence simply does not support the routine administration of prophylactic antibiotics following anterior nasal packing in epistaxis.