Practice patterns regarding noninvasive rhinosinusitis in the immunosuppressed patient population

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ABSTRACT

The number of immunosuppressed patients is growing remarkably. Currently, there is no guideline on how treatment of noninvasive sinusitis in these patients may differ from that of the general population, and practice patterns vary widely across the country. The purpose of this survey was to examine practice patterns and management for this patient population. A survey and literature review were performed. The survey was sent to the membership list serve of the American Rhinologic Society. Twelve questions were asked. Four demographic questions were asked about the physicians and their practices. Four questions were asked about the type of immunocompromised patients they saw. Two questions were asked about management in the setting of significant acute and chronic sinusitis. The responses were collected and analyzed using Pearson independent chi-square testing. Of 871 members on the list serve only 89 physicians responded. The majority of responders were sinus and skull base surgeons practicing in an academic setting. There was a large range of geographic location, years in practice, and patient population. Two significant findings related years in practice to management of chronic sinus immunocompromised patients (p = 0.012) and correlated the choice of management option in acute and chronic sinus immunocompromised patients (p = 0.006). There is no standardized method of treating the vulnerable patient population of immunocompromised patients with noninvasive acute and chronic sinusitis and this survey shows the wide range of practice. Clinical research is needed to standardize and optimize treatment for these patients.

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and not including PID syndromes. Two questions were asked about management in the setting of significant acute and chronic sinusitis. The responses were collected and analyzed using Pearson independent chi-square testing. Institutional Review Board waiver was obtained for this study.

RESULTS

Of the 871 members on the list serve only 89 physicians responded. The majority of responders were sinus and skull base surgeons practicing in an academic setting, but almost one-third were general otorhinolaryngologists. There was a large range of geographic locations, years in practice, and patient population (Fig. 1). Most respondents saw <20 patients in a given year that fit into our category of immunocompromised or immunosuppressed with acute or chronic sinusitis, respectively, although approximately one-quarter of the respondents saw up to 50 of each. The majority of respondents noted that if they were seeing these patients in the hospital setting, >25% of these cases had been admitted to the hospital for sinus-related disease. A clear majority of responders chose i.v. antibiotics without surgery as their treatment option in immunocompromised patients with acute sinusitis impacting their health status, at 58.4%. However, 28% of our responders chose to treat this same population with i.v. antibiotics and surgery. Conversely, in the patient population of immunocompromised with chronic sinusitis impacting their health status, the field was much more divided, with 36% choosing i.v. antibiotics with surgery, 28.1% choosing i.v. antibiotics without surgery, 21.3% choosing oral antibiotics without surgery, and 14.6% choosing oral antibiotics with surgery. The only two significant findings when looking for patterns related years in practice to management of chronic sinus immunocompromised patients (p = 0.012) and the correlation between choice of management option in both acute and chronic sinus immunocompromised patients (p = .006).

DISCUSSION

Prominent rhinologists across the country have answered very differently to the questions asked on the survey above, some being very aggressive with regard to surgery and others very cautious. There is no evidence at this point to suggest which may be the better path.

This survey was performed to elucidate if there were any treatment patterns existing, and the results bear out that no such pattern exists. Unfortunately the response rate was poor, but varied enough in geographic range and years in practice to prove this point. The answer options were certainly overly simplified, and usually management of these patients occurs in a step-wise approach including more than one of the treatment options, although not always. This oversimplification was done purposely, to try and find trends when grouping these very complex patients into broader groups, thereby increasing statistical power of any one management choice. However, despite this, as the results show, no one option for any larger category of patient clearly won out. Interestingly, the two significant findings relating years in practice to management of immunocompromised patients with chronic sinusitis and choice of management option in chronic sinusitis correlating to choice in acute sinusitis suggest that certain rhinologists do have a set method of management, although these methods appear to be based on experience.

As far back as 1984, Fried et al. noted Psuedomonas to be an organism more likely found in the immunocompromised patient than the immunocompetent.¹ A publication in 1993 again called for heightened suspicion for this organism in HIV patients,² and in 1994 Milgrim et al. showed the presence of the usual pathogens mixed in with Psuedomonas aeruginosa as well as Listeria monocytogenes and Candida albicans in antural cultures from HIV patients.³ In 1996 for the first time cytomegalovirus was implicated in sinusitis in HIV patients by Marks et al.⁴ These organisms were again highlighted in 1997, alongside fungi and mycobacteria as important and different pathogens in the HIV patient.⁵ In 1999, Porter et al. showed that 66% of HIV patients surveyed acknowledged sinonasal disease in the prior 6 months, and in a separate article Decker noted that the clinician could reverse the course of rhinosinusitis by treating the underlying neutropenia or diabetic ketoacidosis that had led to the immunocompromise.⁶,⁷ In 2001, Tarp et al. published an article on the presence and possible reactivation of herpessvirus type 1–8 in sinus aspirates of HIV-infected individuals.⁸ Despite these myriad reports on difference of pathogen and disease process in the immunocompromised population, the treatments used were only elucidated in a few and ranged from “aggressive debridement and topical therapy” to parenteral antibiotics followed by surgery to surgery alone. Not one of them outlined a guide or protocol for treatment options in that patient population. Indeed, the first report in the literature for suggesting how these patients should be appropriately managed has come in 2009, with an article published on balloon sinusplasty in five critically ill patients with acute rhinosinusitis. There was no control group, and only two of the five patients had follow-up after discharge from the hospital, but the authors suggested this to be a safe and effective method in treating this patient population.⁹ Even in a meticulously researched review such as the European Position Paper on Rhinosinusitis and Nasal Polyps 2012, the amount of space dedicated to discussing the immunosuppressed patient
1. What is your primary focus of practice?

| Response | Percent | Count |
|----------|---------|-------|
| a. Sinus and/or Skull Base Surgery | 65.5% | 61 |
| b. Allergy | 2.2% | 2 |
| c. Plastic Surgery | 0.8% | 0 |
| d. Cleft CHD | 23.2% | 25 |

2. How many years have you been in practice?

| Response | Percent | Count |
|----------|---------|-------|
| a. 1-4 years | 24.7% | 22 |
| b. 5-10 years | 13.7% | 14 |
| c. 10-20 years | 20.6% | 21 |
| d. 20-30 years | 20.5% | 20 |
| e. 30+ years | 13.5% | 12 |

3. What is your type of practice?

| Response | Percent | Count |
|----------|---------|-------|
| a. Academic | 55.1% | 49 |
| b. Single specialty | 27.0% | 24 |
| c. Multi-specialty | 5.6% | 5 |
| d. Solo practice | | 12.4% |

4. What is the geographic location of your practice?

| Response | Percent | Count |
|----------|---------|-------|
| a. New England (Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island) | 11.3% | 10 |
| b. Mid-Atlantic (New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia) | 10.9% | 10 |
| c. Southeast (Maryland, Delaware, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida) | 21.2% | 19 |
| d. South central (Texas, Oklahoma, Arkansas, Kentucky, Tennessee, Mississippi, Alabama, Louisiana) | 14.2% | 13 |
| e. Midwest (North Dakota, South Dakota, Nebraska, Kansas, Missouri, Iowa, Minnesota, Wisconsin, Illinois, Michigan, Indiana, Ohio) | 22.3% | 20 |
| f. Mountain (Wyoming, Idaho, Montana, Nevada, Utah, Colorado, New Mexico, Arizona) | 8.7% | 8 |
| g. West coast (Washington, Oregon, California, Alaska, Hawaii) | 10.1% | 9 |
| h. Outside of United States | 0.0% | 0 |

6. During a typical year, how many immunosuppressed patients (patients with HIV/AIDS, poorly controlled diabetes, transplant patients, etc.) do you see with non-invasive acute sinusitis?

| Response | Percent | Count |
|----------|---------|-------|
| a. 0-10 | 71.9% | 64 |
| b. 11-50 | 23.6% | 21 |
| c. 51-75 | 3.4% | 3 |
| d. 76-100 | 1.1% | 1 |
| e. >100 | 0.0% | 0 |

6. During a typical year, how many immunosuppressed patients do you see with non-invasive chronic sinusitis?

| Response | Percent | Count |
|----------|---------|-------|
| a. 0-10 | 58.4% | 52 |
| b. 11-50 | 28.1% | 25 |
| c. 51-75 | 6.7% | 6 |
| d. 76-100 | 3.2% | 3 |
| e. >100 | 4.5% | 4 |

7. Do you see immunosuppressed patients with non-invasive sinusitis in consultation in the in-patient, hospital based setting?

| Response | Percent | Count |
|----------|---------|-------|
| a. Yes | 66.4% | 76 |
| b. No | 13.6% | 15 |

8. If you see these types of patients, what percentage have acute sinusitis?

| Response | Percent | Count |
|----------|---------|-------|
| a. 0-20% | 44.9% | 49 |
| b. 21-50% | 29.2% | 30 |
| c. 51-75% | 16.9% | 15 |
| d. 76-100% | 9.0% | 9 |

9. If you see these types of patients, what percentage have chronic sinusitis?

| Response | Percent | Count |
|----------|---------|-------|
| a. 0-20% | 42.7% | 38 |
| b. 21-50% | 30.9% | 27 |
| c. 51-75% | 22.5% | 20 |
| d. 76-100% | 4.5% | 4 |

10. If you see these types of patients, what percentage have been admitted to the hospital due to sinus related issues?

| Response | Percent | Count |
|----------|---------|-------|
| a. 0-20% | 77.3% | 68 |
| b. 21-50% | 20.2% | 18 |
| c. 51-75% | 2.2% | 2 |
| d. 76-100% | 0.0% | 0 |

11. If an immunosuppressed patient in the hospital has symptoms/signs consistent with non-invasive acute sinusitis, and is hemodynamically stable but sinus issues are complicating overall health status, your treatment plan would consist of:

| Response | Percent | Count |
|----------|---------|-------|
| a. Oral antibiotics without surgery | 73.0% | 64 |
| b. Intravenous antibiotics without surgery | 58.8% | 53 |
| c. Oral antibiotics and surgical intervention | 1.3% | 1 |
| d. Intravenous antibiotics and surgical intervention | 98.4% | 95 |

12. If an immunosuppressed patient in the hospital has symptoms/signs consistent with non-invasive chronic sinusitis, and is hemodynamically stable but sinus issues are complicating overall health status, your treatment plan would consist of:

| Response | Percent | Count |
|----------|---------|-------|
| a. Oral antibiotics without surgery | 21.5% | 19 |
| b. Intravenous antibiotics without surgery | 38.1% | 35 |
| c. Oral antibiotics and surgical intervention | 14.6% | 13 |
| d. Intravenous antibiotics and surgical intervention | 36.8% | 33 |

Figure 1. Survey questions and responses to questions 1–12.
population with rhinosinusitis was a mere 3 pages, out of close to 300 pages. The evidence-based recommendations from this section can be seen in Fig. 2 and clearly do not discuss what a proper treatment protocol may be in these patients except in regard to invasive fungal sinusitis. Four of the six recommendations pertain to patients with PID. Only one of the six recommendations pertain to the group of patients we are discussing in this article, and that recommendation has to do with diagnostic screening, not management.\(^\text{10}\)

Clearly, clinical research is needed to standardize and optimize treatment for this patient population. We are currently performing a retrospective review at our own institution to look for differences in treatment and outcomes and plan to use our findings as a basis for a prospective clinical trial.

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**Figure 2.** European Position Paper on Rhinosinusitis and Nasal Polyps 2012 evidence-based recommendations regarding the immunosuppressed patient population.