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INTRODUCTION

There is a common belief that voice disorders in children will spontaneously resolve as they move through puberty. However, several recent studies have shown that many voice disorders persist in children through puberty and into adulthood. In 21% of adolescents, vocal nodules and voice complaints persist beyond puberty. In addition to the risk of chronic voice problems, dysphonia in a child also presents as an acute issue. Children with dysphonia are perceived to exude anger, illness, decreased intelligence, and various other negative emotional/physical states to the listener. Children with dysphonia report that they are called on less in school, asked to be quiet more frequently, asked about their voice more often, and are rejected from play more often by both peers and superiors (i.e., teachers, parents) than their nondysphonic peers. With over 1 million children in the United States having been diagnosed with a voice disorder, and the annual incidence of childhood dysphonia presentation being 6% to 23% of all children ages 4 to 12 years, this is clearly a significant issue with broad implications. As providers, we must ensure that pediatric dysphonia is being optimally diagnosed and treated. Pediatricians are often the first to see a child who may be displaying hoarseness. Despite this initial contact, there are limited data on the referral patterns of these physicians in relation to their dysphonic patients. A recent study by Sajisevi et al. was the first to look at when and why pediatricians refer dysphonic children to a voice specialist. They found that over 20% of pediatricians never evaluate for voice problems. Their primary reasoning was that neither the patients nor their parents complained of voice issues. Unfortunately, the lack of an active voice complaint does not mean that presenting voice symptoms are insignificant and should be ignored. A recent study by Connor et al. demonstrated that children 2 to 18 years of age can recognize and describe the negative impact their dysphonia has on their emotional, physical, and social/functional domains if they are interviewed correctly. Similarly, Colton et al. found that 50% of dysphonic children are able to articulate how their voice affects them, but only with extensive interviewing. The other 50% could not articulate their symptoms, but were still deemed dysphonic in that study. It can be inferred then, that although a child may be negatively affected by their

Objectives/Hypothesis: Pediatricians are the first physicians to see a dysphonic child (DC), yet there are limited data on their proficiency in caring for them. The objective of this study was to understand how pediatricians’ experience and their comfort in recognizing/diagnosing voice disorders affects their referral patterns and use of basic treatment options.

Study Design: Survey study.

Methods: A 13-question survey was sent to pediatricians in the Children’s Hospital of Philadelphia’s primary care network; 45/216 were returned. Statistical analyses were performed using the Student t test, linear/logistic regression model, Fisher exact test, Kruskal-Wallis test, and Spearman’s correlation test.

Results: Pediatricians practicing longer are more comfortable recognizing dysphonia (P = 0.0022). They are significantly more likely to refer a DC, even without subjective complaints of hoarseness by the family/patient or compounding medical issues. For each year in practice, the probability of referring increases by 1.55% (P = 0.0017). Pediatricians with a higher percentage of dysphonic children in their practice are more likely to trust their own perceptual recognition when deciding to refer (P = 0.0496). Nearly all pediatricians (40/45) would refer to a pediatric otolaryngologist. None would refer to a laryngologist or a voice therapist. No factors significantly affected treatment options.

Conclusions: Veteran pediatricians feel more comfortable diagnosing a voice disorder and are more likely to refer a DC, regardless of patient/parent complaints or compounding factors. Pediatricians are most likely to refer to a pediatric otolaryngologist versus a voice specialist. These findings suggest that education of younger, less-experienced pediatricians about recognizing voice disorders and options for referral is needed. This may improve the overall care of the DC.

Key Words: Dysphonia, pediatrics, pediatricians, referral, patterns, voice disorders, primary care.

Level of Evidence: 4

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Laryngoscope 129: August 2019 Schiff et al.: Pediatricians’ Care of the Dysphonic Child

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dysphonia, they are unlikely to communicate their discomfort to their pediatrician without at least some proper probing questions.

Sajisevi et al. found the most common reason pediatricians referred a dysphonic child out was if the voice problem coincided with other neurological problems. This is inadequate, as the majority of pediatric voice disorders (nodules, polyps, cysts, muscle tension dysphonia) will not coincide with a neurologic disorder, and likewise for a neoplastic etiology such as papilloma. As a result, many children who have voice disorders are being undiagnosed and undertreated. Pediatricians would benefit from improved knowledge regarding the impact of isolated dysphonia on children, recognition and evaluation of dysphonia, as well as appropriate referral options.

The aim of this study was to investigate pediatricians’ self-perceived comfort in recognizing voice disorders and their associated referral patterns and basic treatment recommendations. These measures were compared to the demographics and backgrounds of the pediatricians to evaluate whether there was a correlation. We hypothesized that physicians who had been in practice longer, who see a higher percentage of dysphonic patients, and who practice in an academic setting, would have more knowledge in regard to diagnosis, treatment, and appropriate referral of pediatric patients with voice disorders. Although Sajisevi et al. did a similar study in 2014, their sample size was small, only included one group of responding pediatricians, and did not try to correlate survey responses with physician background/experience. Therefore, the current study was warranted to not only receive more responses from a different institution, but also to gain information on how and whom we can educate further in regard to appropriate pediatric voice care.

MATERIALS AND METHODS

Approval was obtained from the Columbia University Medical Center’s Institutional Review Board. A 13-question survey was sent to pediatricians in the Children’s Hospital of Philadelphia’s (CHOP) primary care network. The survey was created by the primary author with contributions from the senior author and the pediatric otolaryngologist on this article. The survey format and content was lightly based off of research done by Cohen et al. Recipients of this survey were emailed a link to the questionnaire via SurveyMonkey (https://www.surveymonkey.com) with the survey’s title and a brief description of the length of the survey. Recipients were sent one email reminder 2 weeks before the survey closed. The survey was open for 2 months from initial send out to closing. The survey included inquiries about demographics, caseload, and comfort level with pediatric dysphonia. Other questions focused on why, when, and to whom physicians refer these children. Finally, respondents were questioned about their use of basic treatment options. Responses were acquired in various forms (e.g., Likert scale, open text box, yes/no format) (Fig. 1). Participation was voluntary and confidential. Statistical analysis was performed based on the survey responses using a Student t test, linear/logistic regression model, Fisher exact test, Kruskal-Wallis test, Spearman’s correlation test, and a basic descriptive analysis model.

RESULTS

Surveys were sent to 216 pediatricians with 45 returned for a rate of 20.8%. Most pediatricians (93.3%) reported that their caseload of children with dysphonia was 5% or less. Only one respondent reported a 10% caseload of dysphonia, and two respondents were unsure how to answer the question. Of the respondents, 13.1% reported that they were comfortable recognizing dysphonia, whereas 56.6% reported that they were only somewhat comfortable recognizing dysphonia (Fig. 2). In contrast, 90.9% of physicians reported they were comfortable diagnosing a speech disorder, 84.1% a language disorder, and 70.5% a cognitive disorder. However, only 38.6% of respondents reported they were comfortable diagnosing a voice disorder (Fig. 3). When asked what factors would cause them to refer a child based on dysphonia, and given the chance to mark all that apply, 88.6% of physicians said the parent’s complaint of dysphonia 66% reported the child’s complaint of dysphonia, and 72.4% reported their own perceptual recognition of the child’s dysphonia. Of the physicians, 72.4% chose a compounding speech disorder, whereas only 54.5% chose compounding throat pain as a reason. Of the pediatricians, 38.1% refer out if patients have dysphonia for greater than 1 month, 11.9% after 2 to 3 weeks, 21% from 1 to 6 months, and 9.5% at 6 months to 1 year. When asked about referral patterns (who to refer to first), respondents were given a multiple choice option of pediatric otolaryngologist, otolaryngologist, laryngologist, speech-language pathologist (SLP), or voice therapist. The majority of the respondents (88.9%) refer to pediatric otolaryngologists, 6.7% to an otolaryngologist, and 4.4% to an SLP. None of the respondents chose the option of sending a child to a laryngologist or a voice therapist. The only question on the survey that had a correct answer was: What is your perception regarding the fields of speech–language therapy and voice therapy? Only 4.5% of respondents (two physicians) answered this appropriately: they are the same field; however, most speech therapists cannot do voice therapy. Of the responses, 24.4% felt that they are separate fields, but most therapists can do both speech–language pathology and voice therapy. In reference to empiric treatment, 11% of physicians reported giving reflux medication very often, whereas 48.9% said sometimes. Only 4.4% of all the respondents said they sometimes gave steroids, whereas the rest of respondents, 46.7%, seldom or never did. It was not specified on the survey what type of steroids were being asked about (i.e., nasal steroids, inhaled steroids, oral steroids).

Results of the survey were analyzed and correlated to the pediatricians’ type of practice, duration in practice, and comfort recognizing dysphonia/comfort diagnosing dysphonia. Pediatricians who have been in practice longer (P = .007) and pediatricians who are more comfortable recognizing dysphonia (P = .0055), were significantly more likely to refer a child to a specialist even without a subjective complaint of dysphonia and/or a compounding factor (i.e., other speech–language disorders, complaints of throat pain, neurological/cognitive disorders) (Figs. 4 and 5). For each year in practice, the probability of referring patients with dysphonia increased 1.5% (P = .0017). Pediatricians with a higher percentage of dysphonic patients in their practice are significantly more likely to trust their own perceptual recognition of a child’s dysphonia when deciding to refer to a specialist (P = .0496). This is important as a child’s dysphonia may often present without comorbidities or without parent/caregiver or child recognition or complaint.
Pediatricians, even those who are junior, should have the knowledge and confidence to trust their own perceptual judgment of dysphonia so they can make the appropriate referrals even without the aforementioned factors. There was no statistical significant found between pediatricians’ place of practice and the discussed referral patterns above.

**DISCUSSION**

Appropriate identification, diagnosis, and treatment of pediatric voice disorders can be imperative to a child’s academic, social, and emotional success. Without proper prompting from the physician, neither a child nor their parents may complain of dysphonia, as it is a difficult...
concept to verbalize and often becomes normalized when a child has been dysphonic for a long time. With regard to common vocal fold pathologies (i.e., nodules, polyps, cysts), dysphonia is frequently, and most commonly, an independent symptom and will therefore not be compounded with a speech, language, or cognitive disorder. The identification of a pediatric patient’s voice disorder and the elicitation of its impact on a patient’s function and quality of life rests primarily in a pediatrician’s ability to recognize dysphonia and understand its implications. With 93.3% of pediatricians reporting a case load of 5% or less, and only 55.6% reporting that they were somewhat comfortable recognizing dysphonia, it is likely that the pediatricians who responded to the survey actually have a larger caseload of dysphonic children than they recognize/address. When referring to specialists, 72.4% of pediatricians reported that they would use their own recognition of dysphonia as an impetus for referral; however, a later question revealed that 42.2% of pediatricians would not refer a child if their own recognition of dysphonia was the only factor. This may be due to the erroneous supposition that if the patient or the parent do not complain of hoarseness, then the dysphonia must not be significant. Another possibility is that, considering the discomfort they report with making the diagnosis, some pediatricians may not trust their instincts/perceptual analysis of a voice or may not have the tools to efficiently interrogate the patients to determine if a referral to a voice specialist is necessary.
In comparison to voice disorders, pediatricians were found to be much more comfortable diagnosing speech disorders, as 90.9% reported comfort with diagnosing a speech disorder, 84.1% a language disorder, and 70.5% a cognitive disorder. Most physicians (72.7%) chose a compounding speech disorder as a reason to refer patients with dysphonia for further evaluation. Meaning they would only refer out if there was a compounding factor such as throat pain or concomitant speech/language/cognitive disorders. There was statistical significance in the comparison between these responses and years in practice/comfort with diagnosing dysphonia, in that many younger pediatricians or those less comfortable with recognizing dysphonia responded they would refer for dysphonia, only if there were a variety of compounding disorders. It is important to note that speech, language, and most cognitive disorders should not be a consideration when referring for dysphonia, as they almost never correlate with a voice disorder. We do acknowledge that pediatricians were allowed to choose more than one
reason for referral in this question, which may have partially skewed the responses. However, this finding demonstrated that pediatricians with less years in practice have a gap in their understanding of the typical presentation of voice disorders and their associated comorbidities. Understanding why the disparity exists between comfort levels with speech/language/cognitive disorders compared to voice disorders may allow better training related to voice disorders.

About half of the responding pediatricians (54.6%) chose compounding throat pain as a reason for referral. This is encouraging, as the most common way in which a child could independently report their own vocal strain or vocal fatigue associated with dysphonia was by stating they had a sore throat. It is unclear whether the referral was due to fear of a secondary disorder or if the throat pain was seen as a corollary to the severity of dysphonia. Regardless, the complaint of throat pain is an important factor when evaluating a child with dysphonia.

Most voice specialists would agree that the duration of dysphonia that should trigger a referral to a specialist in adults is 2 to 3 months. There do not seem to be data indicating a consensus in the pediatric population. Many of our survey respondents (52.3%) chose > 1 month as their period for their patients; however, the remainder of pediatricians’ responses were quite varied between the given time frames. It should be noted that this question may have been posed in a less than ideal manner, as given time frames. It should be noted that this question may have been posed in a less than ideal manner, as pediatrician’s were given both the choice >1 month and possibilities of a general SLP and a voice therapist, both of whom may treat children and who have subspecialties specifically in voice disorders. Although a general otolaryngologist or one who specializes in pediatrics is an appropriate referral, evaluation and treatment patterns of voice disorders differ among otolaryngologists, and not all general otolaryngologists are experts in voice care. We must consider that some of the referral pattern responses may be skewed in this study due to the environment and community in which these pediatricians practice. At CHOP, the pediatricians have quick access to pediatric otolaryngologists with a thorough knowledge of voice disorders, which may not be the case in other settings/environments. Additionally, laryngovideostroboscopy is an essential tool in the evaluation of a voice disorder. Its use has been shown to result in the change of diagnosis 10% to 47% of the time and is helpful or critical in 27.2% to 68% of cases.

Many otolaryngologists and pediatric otolaryngologists who do not specialize in voice care do not have this type of equipment and may not be thoroughly trained in the management of voice disorders. Therefore, referral to a pediatric otolaryngologist with particular interest in voice care or to a laryngologist who cares for children may be the most prudent referral option. Similar to these physician referral patterns, pediatricians indicated they would refer to a SLP rather than a voice therapist. Although some SLPs who identify themselves as generalists do have interest in voice, all voice therapists are SLPs who specifically care for patients with voice disorders. As such, a voice therapist may be a more prudent referral than a general SLP. The reason for this referral pattern may have been answered by the question: What is your perception regarding the fields of speech–language therapy and voice therapy? The responses indicate that the difference between the capabilities of a general SLP and a voice therapist are confusing and not well understood.

Finally, physicians were asked about empiric management of patients with dysphonia. A 2014 study found that 47.2% of pediatricians commonly trialed allergy and reflux medications prior to referral, and a total of 12.5% prescribed steroids. The type of steroid was not specified in either that or this study (e.g., oral, nasal). Our study shows a lower rate of empiric reflux medicine–prescribing practices. This is a welcome change and may be due to the recent revelations of the substantial risks of long-term use of proton pump inhibitors, as well as the recognition that, as providers, we may be overdiagnosing reflux in dysphonic patients.

Limitations of this study include sample size/response rate, one network of respondents (in one location/environment), and the fact that those providers who took the time to respond may have a higher interest in voice disorders, possibly skewing the results. Additionally, some of the questions on the survey were not as specific as they could have been (i.e., type of steroids, oral vs. nasal). Given these limitations, the findings of this study are preliminary. Further studies should include a larger sample size, multiple facilities participating, and a few alterations to the survey questions to increase specificity. Additionally, a future direction for this work would be testing pediatricians’ ability to correctly perceive and rate dysphonia through audio samples and seeing what type of training/education could be beneficial to improve this accuracy.

CONCLUSION
Pediatricians who have been practicing longer report feeling more comfortable diagnosing a voice disorder and are more likely to refer patients solely on their own perception of dysphonia, regardless of patient/parent complaints or compounding factors. There was no statistical significance found between pediatricians’ place of work and comfort in diagnosing/treating/referring for voice disorders. Of note, this study did not confirm that more seasoned pediatricians have an accurate perception of dysphonia, it merely showed that these pediatricians are willing to refer solely based on their perception of dysphonia. Validating these pediatricians’ abilities to accurately perceive dysphonia would be an excellent future study. Pediatricians are more likely to refer to a pediatric otolaryngologist versus a laryngologist. In addition, pediatricians seem to be unclear about the subtle, but important, differences between a general SLP and a specialized voice therapist. In general, pediatricians tend to be more comfortable diagnosing speech and language disorders versus voice disorders. There also seems to be some misinformation that dysphonia will often be compounded by another speech, language, or cognitive disorder. These findings
suggest the importance of educating pediatricians, specifically less-seasoned ones, about the recognition of voice disorders, the difference between a general SLP and a voice therapist, and the optimal patterns of referral to either a pediatric otolaryngologist specializing in voice care or a laryngologist who sees children. One way this can be achieved is by voice specialists lecturing to pediatric residents on the importance of voice care, dysphonia, and appropriate management practices. This would ensure pediatricians are exposed to this information early and allow them to incorporate it into their practice from the start. For those out of training, voice specialists can reach out to local pediatricians, specifically those newer to practice, and provide brief presentations on these topics. This would likely improve the care of children with voice disorders, allowing them more timely and appropriate access to voice specialists.

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