Frequency and Variability of Advice Given to Parents on Care of the Uncircumcised Penis by Pediatric Residents: A Need to Improve Education

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OBJECTIVE To understand the extent to which pediatricians are providing advice on care of the uncircumcised penis and the advice they are providing. We hypothesized that pediatric residents lack preparedness to offer parents advice on caring for the uncircumcised penis and as such are unlikely to offer such advice.

METHODS An IRB approved, anonymous survey was administered to 244 pediatric residents in 5 urban training programs (Appendix). Descriptive statistics were used for clinical and demographic data and Fisher's exact and Kruskal-Wallis tests were used for comparative analysis.

RESULTS Eighty-three residents completed the survey for a response rate of 34%. Less than half (45%) of the residents surveyed were likely, or extremely likely to voluntarily offer advice to parents on care of the uncircumcised penis. On a scale of 0-100, the median confidence level in offering advice was 48 (interquartile range [IQR] 30-52). Forty-nine percent of residents reported never being taught care of the uncircumcised penis. Of those who received education, 72% reported learning informally from a senior resident or attending and only 9% learned from a formal lecture. Pediatric residents varied greatly on advice given to parents in regards to the frequency of retraction and 40% offered no advice.

CONCLUSION This study demonstrates that pediatric residents currently lack confidence in providing parents advice on preputial care and are unlikely to offer such advice. When offered, the advice given is highly variable. This study emphasizes the need for improved education of pediatric residents. UROLOGY 136: 218–224, 2020. © 2019 Elsevier Inc.

The American Academy of Pediatrics (AAP) Task Force on Circumcision recommends that regardless of circumcision status "parents of newborn boys should be instructed in the care of the penis".[1] While circumcision rates in the United States have traditionally been high due to cultural, societal, and religious norms; since 1979, neonatal circumcisions have declined to 58% in 2010.[2] As primary care providers, pediatricians are increasingly caring for more uncircumcised boys. Parents rely on their pediatricians to provide recommendations on the care of their infants, including penile care. The extent to which pediatricians are providing such advice and the specific advice they are providing parents remain unclear.

Despite being trainees, pediatric residents function as primary care providers throughout their residency. One of the key education requirements for graduating pediatric residents is competency in "understanding the indications, contraindications, and complications of circumcision".[3] Implicit in this requirement is knowledge regarding proper care of the uncircumcised penis, and recognition of pathologies that would necessitate intervention. The extent to which the pediatric resident receives such education is unclear. In this study, we hypothesized that pediatric residents lack the preparedness to offer parents advice on caring for the uncircumcised penis, and are thus unlikely to offer such advice. Furthermore, we sought to better characterize the type of advice pediatric residents are providing among those who report offering advice.

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MATERIAL AND METHODS

An Institutional Review Board approved, anonymous 19-question survey (Appendix) was administered to 244 pediatric residents in 5 urban training programs, of which 4 were academic and 1 was community-based. Surveys were available in both electronic and paper formats. Residents received an initial email invitation to participate through their program director or coordinator and one subsequent, reminder e-mail. Paper forms were also made available at a Grand Round, Morning Report or Didactic Conference. Participation was strictly voluntary. Residents were surveyed on how they learned about care of the uncircumcised penis, the frequency and their confidence in providing this advice to parents, the timing for when they recommended starting preputial retraction, and how frequent retraction should be. Data was collected and managed using REDCap (Research Electronic Data Capture) tools hosted at our institution. Statistical analysis was performed using SPSS (IBM, Armonk, NY) and Microsoft Excel (Redmond, WA) and significance was defined as $P < .05$. Descriptive statistics, including median and interquartile range (IQR), were used for clinical and demographic data. Fisher's exact test and the Kruskal-Wallis test were used for comparative analysis of categorical and non-parametric, continuous data, respectively.

RESULTS

Eighty-three residents completed the survey for a response rate of 34%. Demographic characteristics of the respondents are shown in Table 1. Respondents were reflective of the surveyed population; 21% of respondents were male and 25% of residents surveyed were male. Respondents estimated that approximately 33% (IQR 25-50) of their patient population was uncircumcised and that a median of 81% of their patients had publicly funded insurance (IQR 73-90).

Thirty-seven residents (45%) reported being likely, or extremely likely to offer advice to parents on care of the uncircumcised penis. Twenty-four respondents (29%) reported being unlikely or extremely unlikely to offer advice and 22 (27%) were neutral (Fig. 1). No significant difference in likelihood of offering advice was seen between PGY 1-3 ($P = .5$). On a scale of 0-100, the median confidence in offering advice to parents on preputial care was 48 (IQR 30-52) (Fig. 2). No significant

Table 1. Demographic and training information of respondents

Gender	
Female	62 (79%)
Male	16 (21%)
- Circumcised	9/15 (60%)
Race	
White	57 (73%)
Black	5 (6%)
Asian	12 (15%)
American American/Alaskan	1 (1%)
Native Hawaiian/Pacific Islander	1 (1%)
Other	5 (6%)
Year of Training	
First year	21 (30%)
Second year	24 (34%)
Third year	24 (34%)
> Third year	2 (3%)
When care of the uncircumcised penis was learnt	
During medical school	14 (15%)
During residency	36 (44%)
Never	40 (49%)
Other	4 (5%)
Source from which care was learnt	
Senior resident or attending	54 (72%)
Class or lecture	7 (9%)
Internet or handout	28 (37%)
Personal experience	11 (15%)
Other	5 (7%)

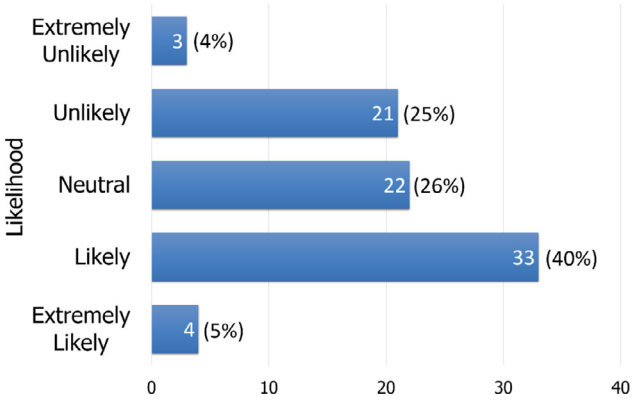

Figure 1. The likelihood of pediatric residents to offer parents advise on care of the uncircumcised penis based on a Likert scale of 1-5. Data is shown as aggregated values of all respondents. Subgroup analysis showed no significant difference between PGY levels (Fisher exact test, $P = .5$). (Color version available online.)

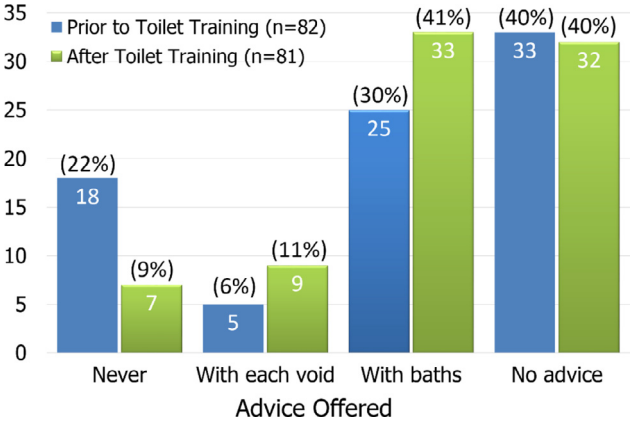

Figure 3. The advice offered by pediatric residents to parents on when to retract the foreskin before (blue) and after (green) toilet-training are shown. (Color version available online.)

differences in confidence were found between PGY levels 1-3 [medians 36 (IQR 17-56), 50 (32-55.0), and 50 (33-56), respectively, $P = .42$). Forty (49%) residents reported never being taught care of the uncircumcised penis (Table 1). Of those who reported receiving education, 54 (72%) reported learning from either a senior resident or attending and only 7 (9%) learned from a formal class or lecture (Fig. 3).

Overall, 31 (38%) residents advised starting preputial retraction based on age and 23 (28%) on toilet-training status. Residents who based their recommendation on age advised beginning retraction at a median age of 2.5 years (IQR 1-4.5). Of those who advised based on toilet training status, nearly half of the respondents (11, 48%) believed retraction should start prior to toilet training, 6 (26%) during toilet training and another 6 (26%) after toilet training. Of those who reported discussing care with families prior to toilet training, 25 (31%) recommended retracting with baths, 18 (22%) recommended never retracting the foreskin, and 5 (6%) recommended retracting with each diaper change. Thirty-three (40%) residents indicated that they did not offer advice either way and 1 (1%) had other recommendations. Of those who reported advising parents to retract after toilet training, 33 (40%) recommended retracting with baths, 9 (11%) with each void and 7 (9%) recommended never retracting the foreskin. Again, 33 (40%) did not offer advice and 1 (1%) had other recommendations.

When questioned on when phimosis required treatment, 46 (59%) indicated that treatment was indicated when there was difficulty voiding, 44 (56%) when infections were present, 31 (40%) when it was considered bothersome to the family, and 30 (39%) when issues with hygiene were encountered. Twelve (15.4%) indicated that phimosis should always be treated while 1 (1.3%) believed that phimosis should never be treated. Only 15 (19%) believed that phimosis should be treated if the foreskin does not retract by a certain age (median 3.7 years, IQR 2-4.25).

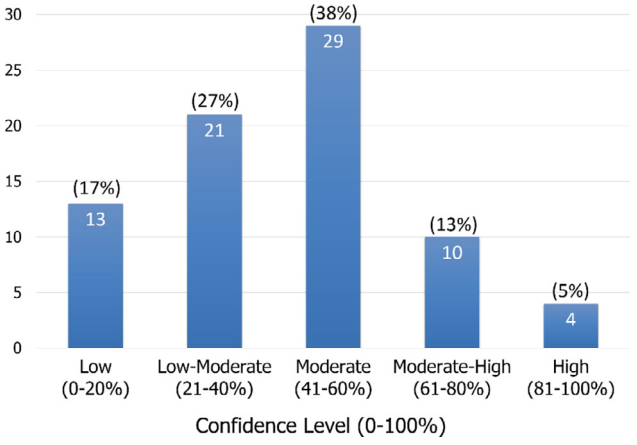

Figure 2. Confidence level of pediatric residents on offering advice to parents on care of the uncircumcised penis. Values are rated on a percent scale of 0% (no confidence) to 100% (extremely confident). The data is shown in aggregate with no significant difference between PGY levels (Krushal-Wallis test, $P = .42$). (Color version available online.)

DISCUSSION

As recommended by the AAP's Task Force on Circumcision, parental education on the care of the penis is an important obligation for pediatricians.[1] The importance of educating parents on the maintenance of good genital hygiene, the natural history of physiologic phimosis, and the avoidance of forceful foreskin retraction must be conveyed to parents of uncircumcised boys in order to prevent complications such as balanoposthitis and the development of pathologic phimosis.[4-6] It remains unclear just how effectively this message is being conveyed to parents. A search of online parenting forums provides evidence of parental confusion regarding preputial care and lack of information being given to parents by their pediatricians.[7,8]

Little is known about pediatricians' knowledge of preputial care as well as the frequency and type of advice they are providing. One study by Osborn et al, found that pediatricians' knowledge on the natural history of the prepuce increased with time in practice, leading the authors to conclude that most pediatricians learned preputial care

empirically rather than during residency training. However, even amongst pediatricians with greater than 10 years in practice, only 29% correctly estimated when the foreskin should retract easily. Furthermore, when mothers of uncircumcised boys were questioned, only 7 of 15 reported receiving instructions on how to care for their son's penis.[9]

The lack of knowledge amongst pediatricians regarding the natural history of physiologic phimosis has been postulated to be responsible for unsafe practices, such as forceful retraction, as well as unnecessary referrals to specialists. In Osborn et al.'s study, 47% of mothers with uncircumcised boys reported having their son's foreskin forcefully retracted by a medical provider.[9] Furthermore, multiple studies have shown that failure to recognize normal physiologic phimosis and penile adhesions are a major cause of unnecessary referrals to pediatric surgical specialists.[10-13]

Our study of pediatric residents supports the findings of Osborn et al., illustrating that pediatric residents are not receiving adequate education in preputial care and thus, are reluctant to provide advice to their patients' families. Although knowledge of urologic conditions is a core requirement of the Accreditation Council for Graduate Medical Education (ACGME) for pediatric residencies, formal rotations in urology are not required.[3] As such, many pediatric residents have little to no clinical exposure to pediatric urology. In a study by Sarkissian et al. only 65% of surveyed pediatric residency program directors indicated that their residents received didactic or formal teaching in urology and only 50% reported their residents receiving any clinical experience in urology. Overall, 85% of pediatric residency program directors reported a need for greater exposure in pediatric urology.[10]

In our study, even when advice on the care of the uncircumcised penis was offered, the advice provided was highly variable. A potential cause for this variability is the lack of consensus in optimal strategies of care. Currently, there are no existing evidence-based guidelines regarding preputial care and available resources are often vague, potentially conflicting, and subject to national and cultural variability. For example, the AAP provides only general guidelines on care, focusing mainly on the avoidance of forceful retraction. In terms of when to begin retraction, parents are advised to begin "only when the foreskin completely retracts" or at puberty.[4] However, physiologic phimosis has been reported to persist in 1% of 16 year olds, potentially leading to confusion for both the parent and provider as to when to begin retraction.[11]

Our rationale for surveying pediatric residents as opposed to practicing pediatricians was twofold. First, surveying residents could more readily identify deficiencies in resident training that may be amendable to improvement. Second, we felt that the practices of residents more accurately reflect current practices and avoid the variability of practicing pediatricians who might have had differing opportunities to learn over time.

The results of our study point to several potential areas for improvement. First, education of pediatric residents in pediatric urology must be improved. Given the current environment of work-hour restrictions as well as the limitations of resources and faculty, dedicated pediatric urology rotations, while desirable, may not be feasible. Sarkissian et al. advocated the increased use of online or web-based learning modules to improve pediatric residents' accessibility to pediatric urology. In their study, 66% of respondents favored such an approach.[10] Furthermore, structured e-Learning in urology has been shown to be effective and efficacious in teaching difficult topics and clinical skills such as grading of pediatric hydronephrosis and performance of pediatric orchiopexies.[12-14] The creation of e-Learning modules on genital care emphasizing key points of care, such as the avoidance of forceful retraction and the proper identification of preputial pathologies that warrant referrals to a pediatric urologist, would be one way to improve such education without adding significant burden.

Second, this study highlights the need for improvement in guidelines on proper care of the prepuce. As recognized experts, it is incumbent upon our specialty to lead the way. Although prospective, randomized controlled trials on differing methods of care would be ideal, given the low (9.6%) prevalence of pathologic phimosis in uncircumcised men,[6] and the lack of direct evidence implicating improper care with its development, such a study seems infeasible. However, using the best evidence and expert opinions available, specific consensus best practices in the care of the uncircumcised penis should be adopted.

As with all survey studies, this study is limited by sampling and response bias. The residents surveyed were those from a single geographic area with a high prevalence of circumcision, which may limit the generalizability of our findings. Further studies on a national level are warranted to confirm our findings. Although the response rate (34%) was consistent with previously published average e-mail response rates,[15] it is possible that nonresponders had a difference in level of confidence and were more willing to provide advice to parents. Additionally, 32% of the respondents were in their first year of residency, raising the concern that they may not have been exposed to training that would be available later in their program. However, we found no increase in confidence or likelihood to give advice with increasing PGY levels, suggesting that such education is either not currently available or it is not effective. While the questionnaire was based on a literature review and was pilot tested for content, it should be noted that it was not validated prior to its use and represents a further limitation of our study. Despite these limitations, this study offers insight into the lack of preparedness and in the frequency and variability of advice offered by pediatric residents to parents regarding care of the uncircumcised penis.

CONCLUSION

As circumcision rates have decreased in the United States, it is vital that pediatricians are prepared to advise parents

on the care of the uncircumcised penis. This study demonstrates that pediatric residents lack confidence in advising parents on preputial care and are unlikely to offer advice. When offered, the advice given is highly variable and the residents' confidence in their advice to parents is low. This study emphasizes the need for improvement in the urologic education of pediatric residents and the need for further investigation in order to establish best practice guidelines for the care of the uncircumcised penis. Once these recommendations are established, a multimodal approach should be employed to improve the education of pediatrics residents in the realm of care of the uncircumcised penis.

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APPENDIX

Survey: Care of the uncircumcised penis

1. In which zip code (or country) do you currently practice?
2. Approximately what percent of your patient population has Medicaid or another government-promoted insurance program?
   - Slider bar (0-100%)

3. Approximately what percentage of your male patients would you estimate are uncircumcised?
   - Slider bar (0-100%)

4. How likely are you to offer advice to families on how to care for the uncircumcised penis?
   - Extremely unlikely
   - Unlikely
   - Neutral
   - Likely
   - Extremely likely

5. How confident are you in advising your patients/families on care of the uncircumcised penis?

   1 2 3 4 5 6 7 8 9 10

   No Confidence Moderate Confidence Complete Confidence

6. At what point did you formally learn how to care for the uncircumcised penis?
   - Have not formally learned
   - During medical school
   - During residency
   - During fellowship
   - In practice
   - Other: _____

7. From which of these sources did you learn how to care for the uncircumcised penis?
   - From a senior resident/attending
   - From a class/lecture
   - From a handout/internet source
   - Personal experiences
   - Other: _____

8. Do you base your advice on when to begin retracting the foreskin on:
   - Patient's age (If selected, age will be write in)
   - toilet training - (if selected, before, during, after)
   - I do not routinely advise patients/families on when to retract the foreskin
   - Other:_____

9. **Prior to toilet training**, which of following best characterizes the advice you give to parents regarding retraction of the foreskin?
   - They should never retract the foreskin
   - They should retract the foreskin with each diaper change
   - They should retract the foreskin with baths
   - I do not advise them either way
   - Other: _____

10. **After toilet training**, which of following best characterizes the advice you give to parents regarding retraction of the foreskin?
    - They should never retract the foreskin
    - They should retract the foreskin with each void

- They should retract the foreskin with baths
- I do not advise them either way
- Other:_____

11. When does phimosis need to be treated? (Check all that apply)
    - Never
    - If the foreskin does not retract by age _____ (fill in)
    - If there are problems with hygiene
    - If there is an infection
    - If there is difficulty voiding
    - If it is bothersome to the patient or family
    - Always

Demographic Information

1. Do you consider yourself to be Hispanic/Latino?
    - Yes
    - No

2. In addition, select one or more of the following racial categories to describe yourself:
    - American Indian or Alaska Native
    - Asian
    - Black or African American
    - Native Hawaiian or Pacific Islander
    - White
    - Other: Specify

3 Did you do your residency training in the US?
    - Yes
    - No

4. In what country did you train?_____
5. How long have you been in practice?
    - Still in residency/fellowship
      i PGY year _____
    - 0-5 years
    - 6-10 years
    - 11-15 years
    - >16 years

6. What is your gender?
    - Female
    - Male
    - Other: specify_____

7. If you are male, are you circumcised?
    - Yes
    - No

8. If you have a male child, is he circumcised?
    - Yes
    - No
    - At least one child is circumcised and one is not
    - N/A